Austrian Institute of Construction Engineering
Schenkenstrasse 4 | T +43 1 533 65 50
1010 Vienna | Austria | F +43 1 533 64 23
www.oib.or.at | mail@oib.or.at

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

Member of EOTA
www.eota.eu

# European Technical Assessment

# ETA-13/0793 of 22.08.2019

General part

| | |
|---|---|
| **Technical Assessment Body issuing the European Technical Assessment** | Österreichisches Institut für Bautechnik (OIB)<br>Austrian Institute of Construction Engineering |
| **Trade name of the construction product** | Pacifyre® EFC System |
| **Product family to which the construction product belongs** | Fire Stopping and Fire Sealing Products: Penetration Seals |
| **Manufacturer** | J. van Walraven Holding B.V.<br>Industrieweg 5<br>3641 RK Mijdrecht<br>THE NETHERLANDS |
| **Manufacturing plant** | Walraven Factory S2 |
| **This European Technical Assessment contains** | 84 pages including Annexes A-1 to F-18 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 „Fire stopping and fire sealing products – Penetration seals" |
| **This European Technical Assessment replaces** | European technical approval ETA-13/0793 with validity from 28.06.2013 to 27.06.2018 |

This European Technical Assessment is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1, or manufacturing plants other than those laid down in the context of this European Technical Assessment.

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction can be made with the written consent of the Österreichisches Institut für Bautechnik. In this case, partial reproduction has to be designated as such.

This European Technical Assessment may be withdrawn by the Österreichisches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 25 (3) of Regulation (EU) No 305/2011.

Specific parts

## 1 Technical description of the product

"Pacifyre® EFC System" is a product to be used as pipe penetration seal based on the pipe collar "Pacifyre® EFC" in combination with gap fillers and insulations (additional components).

| **Components of pipe collar "Pacifyre® EFC"** | **Characteristics** |
|---|---|
| Pacifyre® IM 2 | Flexible intumescent strip (provided with a self-adhesive device) with a nominal thickness of 2,0 mm and a width of 40 mm |
| Pacifyre® IM 3 | Flexible intumescent strip (provided with a self-adhesive device) with a nominal thickness of 2,0 mm and a width of 40 mm |
| Pacifyre® EFC Band | Metal strap according to Annex B of the ETA made of sheet steel (alloy 1.4016 according to EN 10088-2) with a width of 42,5 mm for fixing of "Pacifyre® IM 2" and "Pacifyre® IM 3" |
| Pacifyre® EFC Hook | Metal hook according to Annex B of the ETA made of sheet steel (alloy 1.4016 according to EN 10088-2) for fixing the "Pacifyre® EFC Band" to the separating element |

| **Gap fillers (additional components)** | **Characteristics** |
|---|---|
| Pacifyre® FPF | Intumescent fire protection foam on the basis of polyurethane (2-component) – filled in cartridges – only to be used as gap filler in rigid floors for plastic pipes "Wavin SiTech+", "Geberit Silent-PP", "POLO-KAL NG" and "RAUPIANO PLUS" |
| Pacifyre® A | One component fire retardant sealant based on a water based acrylic dispersion with plasto-elastic properties – filled in cartridges – only to be used as gap filler in flexible walls and rigid walls for plastic pipes where "Pacifyre® EFC" is installed flushed within the separating element (without "Pacifyre® EFC Hook") or "Pacifyre® IM 3" is installed flushed within the separating element (without "Pacifyre® EFC Band") |

| Gap fillers (additional components) | Characteristics |
|---|---|
| Pacifyre® S | Neutral one component fire retardant sealant based on silicone – filled in cartridges – only to be used as gap filler in flexible walls and rigid walls for plastic pipes where "Pacifyre® EFC" is installed flushed within the separating element (without "Pacifyre® EFC Hook") or "Pacifyre® IM 3" is installed flushed within the separating element (without "Pacifyre® EFC Band") |
| Pacifyre® H | One component fire retardant sealant based on a silyl modified polymer (MS-Polymer) – filled in cartridges – only to be used as gap filler in flexible walls and rigid walls for plastic pipes where "Pacifyre® EFC" is installed flushed within the separating element (without "Pacifyre® EFC Hook") or "Pacifyre® IM 3" is installed flushed within the separating element (without "Pacifyre® EFC Band") |
| Pacifyre® FPM | Cement based fire protection mortar according to EN 998-2, containing Portland cement, with a nominal dry bulk density of 1.620 kg/m³ – only to be used as gap filler in flexible walls and rigid walls for metal pipes where "Pacifyre® EFC" is installed flushed within the separating element (without "Pacifyre® EFC Hook") |
| Gap Filler | Non-combustible material with classification A1 or A2-s1,d0 according to EN 13501-1 which is dimensionally stable as e.g. mortar, cement or gypsum joint filler |
| Mineral wool | Stone wool according to EN 14303 with classification A1 according to EN 13501-1, a minimum apparent density of 100 kg/m³ and a melting point > 1000 °C according to DIN 4102-17 (e.g. "PAROC Pro Loose Wool" from manufacturer "Paroc Oy Ab") |

| Insulations (additional components) | Characteristics |
|---|---|
| AF/Armaflex | Closed cell, flexible elastomeric foam (FEF) insulation in form of (slotted) tubes (can be provided with a self-adhesive device) with classification $B_L$-s3,d0 – including "Armaflex 520" – according to EN 13501-1 from manufacturer "Armacell GmbH" |
| AF/Armaflex Band selbstklebend (AF/Armaflex self-adhesive tape) | Closed cell, flexible elastomeric foam (FEF) insulation in form of tapes with a self-adhesive device with classification B-s3,d0 according to EN 13501-1 from manufacturer "Armacell GmbH" |

| Insulations (additional components) | Characteristics |
|---|---|
| SH/Armaflex | Closed cell, flexible elastomeric foam (FEF) insulation in form of (slotted) tubes (can be provided with a self-adhesive device) with classification $B_L$-s3,d0 – including “Armaflex 520” – according to EN 13501-1 from manufacturer “Armacell GmbH” |
| SH/Armaflex Band selbstklebend (SH/Armaflex self-adhesive tape) | Closed cell, flexible elastomeric foam (FEF) insulation in form of tapes with a self-adhesive device with classification B-s3,d0 according to EN 13501-1 from manufacturer “Armacell GmbH” |
| Armaflex 520 | Polychlorene-based adhesive, free from aromatic compounds (special adhesive for processing of all flexible Armaflex insulating material – except “HT/Armaflex”) from manufacturer “Armacell GmbH” |
| Polyethylene sound insulation | Closed cell, flexible polyethylene foam insulation in form of tubes (can be faced with an inside and outside PE-foil) with a thickness of up to 4 mm, a density of 30 kg/m³ to 40 kg/m³ and classification $E_L$ according to EN 13501-1 (e.g. THERMACOMPACT TF™ from manufacturer “thermaflex®”) |

## 2 Specification of the intended use(s) in accordance with the applicable European Assessment Document

### 2.1 Intended use

"Pacifyre® EFC System" is intended to be used as a pipe penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been provided with apertures which are penetrated by various metal pipes and plastic pipes.

"Pacifyre® EFC System" can only be installed in the types of separating elements as specified in the following table.

| Separating element | Construction |
|---|---|
| Flexible walls | > Steel studs or timber studs lined on both faces with minimum 2 layer of boards (minimum thickness 12,5 mm) with classification A2-s1,d0 or A1 according to EN 13501-1<br>> For timber stud walls there shall be a minimum distance of 100 mm of the penetration seal to any timber stud. The cavity between the penetration seal and the timber stud has to be closed with minimum 100 mm of insulation with classification A1 or A2 according to EN 13501-1<br>> Minimum thickness 94 mm<br>> Classification according to EN 13501-2: ≥ EI 90<br>> This European Technical Assessment does not cover sandwich panel constructions and flexible walls were the lining does not cover studs on both sides. Penetrations in such constructions shall be tested on a case by case basis |
| Rigid walls | > Aerated concrete, concrete, masonry<br>> Minimum thickness 100 mm<br>> The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period |
| Rigid floors | > Aerated concrete, concrete<br>> Minimum density 550 kg/m³<br>> Minimum thickness 150 mm<br>> The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period |

"Pacifyre® EFC System" can only be configured as specified in the following tables. Other parts or service support constructions shall not penetrate the penetration seal.

| Penetrating element | Construction characteristics for installation of the penetrating element in flexible walls and rigid walls |
|---|---|
| Plastic pipes | > PVC-U pipes according to EN ISO 1452-1 or EN ISO 15493 and DIN 8061 / DIN 8062 with diameters and wall thicknesses as defined in Annex D-1, Annex D-2, Annex D-15 and Annex D-17 of the ETA<br>> PE-HD pipes according to EN 1519-1 or EN ISO 15494 and DIN 8074 / DIN 8075 with diameters and wall thicknesses as defined in Annex D-3, Annex D-4, Annex D-15 and Annex D-17 of the ETA<br>> PP pipes according to EN ISO 15494 and DIN 8077 / DIN 8078 with diameters and wall thicknesses as defined in Annex D-5, Annex D-15 and Annex D-16 of the ETA<br>> "alpex F50 PROFI" and "alpex L" pipes from manufacturer "Fränkische Rohrwerke Gebr. Kirchner GmbH & Co. KG" with diameters and wall thicknesses as defined in Annex D-6 of the ETA<br>> "BluePower®" pipes from manufacturer "Coes Company s.r.l." with diameters and wall thicknesses as defined in Annex D-7 of the ETA<br>> "Uponor Unipipe Mehrschichtverbundrohr MLC" pipes from manufacturer "Uponor GmbH" with diameters and wall thicknesses as defined in Annex D-8 of the ETA<br>> "Wavin SiTech+" pipes from manufacturer "Wavin GmbH" with diameters and wall thicknesses as defined in Annex D-9 of the ETA<br>> "Fusiotherm® Stabiverbundrohr" pipes from manufacturer "aquatherm GmbH" with diameters and wall thicknesses as defined in Annex D-10 of the ETA<br>> "Geberit Silent-PP" pipes from manufacturer "Geberit Vertriebs GmbH & Co KG" with diameters and wall thicknesses as defined in Annex D-11 of the ETA<br>> "POLO-KAL NG" pipes from manufacturer "POLOPLAST GmbH & Co KG" with diameters and wall thicknesses as defined in Annex D-12 of the ETA<br>> "RAUPIANO PLUS" pipes from manufacturer "REHAU AG & Co" with diameters and wall thicknesses as defined in Annex D-13 of the ETA<br>> "Triplus®" pipes from manufacturer "Valsir S.p.A. Sanitaria Idraulica Riscaldamento" with diameters and wall thicknesses as defined in Annex D-14 of the ETA |

| Penetrating element | Construction characteristics for installation of the penetrating element in flexible walls and rigid walls |
|---|---|
| Metal pipes | > Metal pipes of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater or equal than copper (945 °C for EI 60; 1006 °C for EI 90; 1049 °C for EI 120) and a thermal conductivity smaller or equal than copper with diameters and wall thicknesses as defined in Annex D-18 and Annex D-19 of the ETA<br>> Metal pipes of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater or equal than steel (945 °C for EI 60; 1006 °C for EI 90; 1049 °C for EI 120) and a thermal conductivity smaller or equal than steel with diameters and wall thicknesses as defined in Annex D-18 and Annex D-19 of the ETA |

| Penetrating element | Construction characteristics for installation of the penetrating element in rigid floors |
|---|---|
| Plastic pipes | > PVC-U pipes according to EN ISO 1452-1 or EN ISO 15493 and DIN 8061 / DIN 8062 with diameters and wall thicknesses as defined in Annex F-1 and Annex F-17 of the ETA<br>> PE-HD pipes according to EN 1519-1 or EN ISO 15494 and DIN 8074 / DIN 8075 with diameters and wall thicknesses as defined in Annex F-2 and Annex F-3 and Annex F-17 of the ETA<br>> PP pipes according to EN ISO 15494 and DIN 8077 / DIN 8078 with diameters and wall thicknesses as defined in Annex F-4 and Annex F-17 of the ETA<br>> “alpex F50 PROFI” and “alpex L” pipes from manufacturer “Fränkische Rohrwerke Gebr. Kirchner GmbH & Co. KG” with diameters and wall thicknesses as defined in Annex F-5 of the ETA<br>> “BluePower®” pipes from manufacturer “Coes Company s.r.l.” with diameters and wall thicknesses as defined in Annex F-6 of the ETA<br>> “Uponor Unipipe Mehrschichtverbundrohr MLC” pipes from manufacturer “Uponor GmbH” with diameters and wall thicknesses as defined in Annex F-7 of the ETA<br>> “Wavin SiTech+” pipes from manufacturer “Wavin GmbH” with diameters and wall thicknesses as defined in Annex F-8 and Annex F-9 of the ETA<br>> “Fusiotherm® Stabiverbundrohr” pipes from manufacturer “aquatherm GmbH” with diameters and wall thicknesses as defined in Annex F-10 and Annex F-11 of the ETA<br>> “Fusiotherm® SDR 11” pipes from manufacturer “aquatherm GmbH” with diameters and wall thicknesses as defined in Annex F-11 of the ETA<br>> “Geberit Silent-PP” pipes from manufacturer “Geberit Vertriebs GmbH & Co KG” with diameters and wall thicknesses as defined in Annex F-12 and Annex F-13 of the ETA |

| Penetrating element | Construction characteristics for installation of the penetrating element in rigid floors |
|---|---|
| Plastic pipes | > "POLO-KAL NG" pipes from manufacturer "POLOPLAST GmbH & Co KG" with diameters and wall thicknesses as defined in Annex F-14 and Annex F-15 of the ETA<br>> "RAUPIANO PLUS" pipes from manufacturer "REHAU AG & Co" with diameters and wall thicknesses as defined in Annex F-16 of the ETA |
| Metal pipes | > Metal pipes of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater or equal than copper (1049 °C for EI 120) and a thermal conductivity smaller or equal than copper with diameters and wall thicknesses as defined in Annex F-17 and Annex F-18 of the ETA<br>> Metal pipes of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater or equal than steel (1049 °C for EI 120) and a thermal conductivity smaller or equal than steel with diameters and wall thicknesses as defined in Annex F-17 and Annex F-18 of the ETA |

## 2.2 Use condition

"Pacifyre® EFC System" (excluding "Pacifyre® FPM") is intended for use in internal conditions with humidity lower than 85 % RH excluding temperatures below 0 °C, without exposure to rain or UV and can therefore – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type $Z_2$.

Although a penetration seal is intended for indoor applications only, the construction process may result in it being subjected to more exposed conditions for a period before the building envelope is closed. For this case provisions shall be made to protect temporarily exposed penetration seals according to the ETA-holder's installation instructions.

## 2.3 Working life

The provisions made in this European Technical Assessment are based on an assumed working life of "Pacifyre® EFC System" of 10 years, provided the conditions laid down in the technical literature of the manufacturer relating to packaging, transport, storage, installation, use and repair are met.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the Basic requirements for construction works.

## 2.4 General assumptions

2.4.1 It is assumed that:

- damages to the penetration seal are repaired accordingly,
- the installation of the penetration seal does not effect the stability of the adjacent building element – even in case of fire,
- the lintel or floor above the penetration seal is designed structurally and in terms of fire protection such that no additional mechanical load (other than its own weight) is imposed on the penetration seal,
- the thermal movement in the pipe work will be accommodated in such way that it does not impose a load on the penetration seal,
- the installations are fixed to the adjacent building element in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed to the penetration seal,
- the support of the installations is maintained for the required period of fire resistance and
- pneumatic dispatch systems, compressed air systems, etc. are switched off by additional means in case of fire.

2.4.2 This European Technical Assessment does not address any risks associated with the emission of dangerous liquids or gases caused by failure of the pipe(s) in case of fire nor does it prove the prevention of the transmission of fire through heat transfer via the medium in the pipes.

2.4.3 This European Technical Assessment does not verify the prevention of destruction of adjacent building elements with fire separating function or of the pipes themselves due to distortion forces caused by extreme temperatures. These risks shall be accounted for by taking appropriate measures when designing or installing the pipe work.

The mounting or hanging of the pipes or the layout of the pipe work shall be implemented in such a way that the pipes and the fire resistant building elements shall remain functional within a period of time which corresponds to the fire resistance period required.

2.4.4 The risk of downward spread of fire caused by burning material which drips through a pipe to floors below, is not considered in this European Technical Assessment (see EN 1366-3:2009, clause 1).

2.4.5 The durability assessment does not take account of the possible effect on the penetration seal of substances permeating through the pipe walls.

2.4.6 The assessment does not cover the avoidance of destruction of the penetration seal or of the adjacent building element(s) by forces caused by temperature changes in case of fire. This has to be considered when designing the piping system.

## 2.5 Manufacturing

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with the Österreichisches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to the Österreichisches Institut für Bautechnik before the changes are introduced. The Österreichisches Institut für Bautechnik will decide whether or not such changes affect the European Technical Assessment and consequently the validity of the CE marking on the basis of the European Technical Assessment and if so whether further assessment or alterations to the European Technical Assessment, shall be necessary.

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

| Basic requirements for construction works | Essential characteristic | Method of verification | Performance |
|---|---|---|---|
| **BWR 2** | Reaction to fire | EN 13501-1: 2007+A1:2009 | Clause 3.1.1 of the ETA |
| | Resistance to fire | EN 13501-2: 2007+A1:2009 and EN 13501-2: 2016 | Clause 3.1.2 of the ETA and Annex D-1 to D-19 and Annex F-1 to F-18 of the ETA |
| **BWR 3** | Air permeability | No performance assessed | |
| | Water permeability | No performance assessed | |
| | Content, emission and/or release of dangerous substances | No performance assessed | |
| **BWR 4** | Mechanical resistance and stability | No performance assessed | |
| | Resistance to impact / movement | No performance assessed | |
| | Adhesion | No performance assessed | |
| | Durability | EAD 350454-00-1104 clause 2.2.9 | Clause 3.3.4 of the ETA |
| **BWR 5** | Airborne sound insulation | No performance assessed | |
| **BWR 6** | Thermal properties | No performance assessed | |
| | Water vapour permeability | No performance assessed | |

## 3.1 Safety in case of fire (BWR 2)

3.1.1. Reaction to fire

The components of "Pacifyre® EFC System" were assessed according to EAD 350454-00-1104 clause 2.2.1 and classified according to EN 13501-1:2007+A1:2009. [Confirmation from test laboratory still missing]

| Component | Class according to EN 13501-1:2007+A1:2009 |
|---|---|
| Pacifyre® IM 2 | **E** |
| Pacifyre® IM 3 | **E** |
| Pacifyre® EFC Band | **A1** |
| Pacifyre® EFC Hook | **A1** |
| Pacifyre® FPF | **E** |
| Pacifyre® A | **E** |
| Pacifyre® S | **E** |
| Pacifyre® H | **E** |
| Pacifyre® FPM | **A1** |

3.1.2. Resistance to fire

"Pacifyre® EFC System" was tested according to EAD 350454-00-1104 clause 2.2.2 and EN 1366-3:2009 in conjunction with EN 1363-1:1999 and EN 1363-1:2012.

Based upon the gained test results and the field of application specified within EN 1366-3:2009 the pipe penetration seal "Pacifyre® EFC System" has been classified according to EN 13501-2:2007+A1:2009 and EN 13501-2:2016.

The fire resistance classes of the pipe penetration seal "Pacifyre® EFC System" in the relevant separating elements are listed in Annex D-1 to Annex D-19 and Annex F-1 to Annex F-18 of the ETA.

The resistance to fire classification listed in Annex D-1 to D-19 and Annex F-1 to F-18 of the ETA is only valid if "Pacifyre® EFC System" is installed according to Annex A-1 to A-9 of the ETA.

## 3.2. Hygiene, health and the environment (BWR 3)

3.2.1. Air permeability

No performance assessed.

3.2.2. Water permeability

No performance assessed.

3.2.3. Content, emission and/or release of dangerous substances

No performance assessed.

## 3.3. Safety and accessibility in use (BWR 4)

3.3.1. Mechanical resistance and stability

No performance assessed.

3.3.2. Resistance to impact / movement

No performance assessed.

3.3.3. Adhesion

No performance assessed.

3.3.4. Durability

The components “Pacifyre® EFC Band” and “Pacifyre® EFC Hook” are made of ferritic stainless steel, material number 1.4016 according to EN 10088-2.

According to EAD 350454-00-1104 clause 2.2.9.2.5 and Annex B of EN 10088-1 ferritic stainless steels have relatively low corrosion resistance and their use should normally be restricted to mild indoor or similarly protected environments. This type of stainless steel is therefore suitable for use in use condition $Y_1$.

The components “Pacifyre® IM 2” and “Pacifyre® IM 3” fulfil the requirements for use at conditions exposed to weathering and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type X. Since the requirements for Type X are met, also the requirements for Type $Y_1$, $Y_2$, $Z_1$ and $Z_2$ are fulfilled.

The additional component “Pacifyre® FPF” fulfils the requirements for use at conditions exposed to weathering and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type X. Since the requirements for Type X are met, also the requirements for Type $Y_1$, $Y_2$, $Z_1$ and $Z_2$ are fulfilled.

The additional components “Pacifyre® A”, “Pacifyre® S” and “Pacifyre® H” fulfil the requirements for use in internal conditions with humidity lower than 85 % RH excluding temperatures below 0 °C, without exposure to rain or UV and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type $Z_2$.

The additional component “Pacifyre® FPM” has not been assessed.

All components of “Pacifyre® EFC System” (excluding “Pacifyre® FPM”) fulfil the requirements for the intended use condition.

“Pacifyre® EFC System” (excluding “Pacifyre® FPM”) is therefore appropriate for use in internal conditions with humidity lower than 85 % RH excluding temperatures below 0 °C, without exposure to rain or UV and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type $Z_2$.

For the durability of “Pacifyre® EFC System”, when “Pacifyre® FPM” is used, “No performance assessed” applies.

## 3.4. Protection against noise (BWR 5)

3.4.1. Airborne sound insulation

No performance assessed.

## 3.5. Energy economy and heat retention (BWR 6)

3.5.1. Thermal properties

No performance assessed.

3.5.2. Water vapour permeability

No performance assessed.

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

### 4.1. AVCP system

According to the Decision 1999/454/EC[1], amended by Decision 2001/596/EC[2] of the European Commission the system(s) of assessment and verification of constancy of performance (see Annex V of Regulation (EU) No 305/2011) is given in the following table.

| **Product(s)** | **Intended use(s)** | **Level(s) or class(es)** (resistance to fire) | **System** of assessment and verification of constancy of performance |
|---|---|---|---|
| Fire Stopping and Fire Sealing Products | for fire compartmentation and/or fire protection or fire performance | any | 1 |

In addition, according to the Decision 1999/454/EC, amended by Decision 2001/596/EC of the European Commission the system(s) of assessment and verification of constancy of performance, with regard to reaction to fire, is given in the following table.

| **Product(s)** | **Intended use(s)** | **Level(s) or class(es)** (reaction to fire) | **System** of assessment and verification of constancy of performance |
|---|---|---|---|
| Fire Stopping and Fire Sealing Products | for uses subject to regulations on reaction to fire | A1*, A2*, B*, C* | 1 |
| | | A1**, A2**, B**, C**, D, E | 3 |
| | | (A1 to E)***, F | 4 |

* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

** Products/materials not covered by footnote (*)

*** Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of class A1 according to Commission Decision 96/603/EC, as amended)

[1] Official Journal of the European Communities no. L 178, 14.7.1999, p. 52
[2] Official Journal of the European Communities no. L 209, 2.8.2001, p. 33

## 5. Technical details necessary for the implementation of the AVCP system, as provided for the applicable European Assessment Document

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

The notified product certification body shall visit the factory at least twice a year for surveillance of the manufacturer.

Issued in Vienna on 22.08.2019
by Österreichisches Institut für Bautechnik

The original document is signed by:

Rainer Mikulits
Managing Director

## 1 General

> "Pacifyre® EFC System" can be used for metal pipes and plastic pipes according to clause 2.1 of the ETA in apertures in walls (vertical separating element) and floors (horizontal separating element) according to clause 2.1 of the ETA.

> Each metal pipe or plastic pipe which is to be sealed off has to be equipped separately with "Pacifyre® EFC System"; except for multiple penetrations of maximum three plastic pipes (clearance between pipes maximum 15 mm; linear arrangement, no clusters) according to clause 2.1 of the ETA made from PVC-U, PE-HD or PP with diameters and wall thicknesses as defined in Annex D-15 and Annex F-17 of the ETA – these pipes can be equipped with one concerted pipe collar "Pacifyre® EFC". For details see Annex C-7 and Annex E-8 of the ETA.

> In some cases it is allowed to install "Pacifyre® EFC System" on plastic pipes with bows on the bottom side of the floor and a connection sleeve within the floor. For details see Annex E-7, Annex F-9, Annex F-13, Annex F-15 and Annex F-16 of the ETA.

> In some cases it is allowed for floor penetrations to install "Pacifyre® EFC System" on vertical plastic pipes which are positioned directly in the corner of the wall (clearance between pipe and wall maximum 10 mm). The pipe collar "Pacifyre® EFC" covers the pipe only from wall to wall. For details see Annex E-4, Annex E-5, Annex F-3, Annex F-4, Annex F-9, Annex F-13, Annex F-15 and Annex F-16 of the ETA.

### 1.1 Pipe end configuration

> For plastic pipes classified with pipe end configuration U/U the pipe end configuration can be U/U, C/U, U/C and C/C.

> For plastic pipes classified with pipe end configuration U/C the pipe end configuration can be U/C and C/C.

> For metal pipes classified with pipe end configuration C/U the pipe end configuration can be C/U and C/C.

### 1.2 Orientation of the penetrating elements

> Metal pipes and plastic pipes (except for some plastic pipes according to Annex D-1, Annex D-3, Annex D-5, Annex F-1, Annex F-2 and Annex F-4 of the ETA) have to be installed perpendicular to the surface of the separating element.

> Some plastic pipes according to Annex D-1, Annex D-3, Annex D-5, Annex F-1, Annex F-2 and Annex F-4 of the ETA can be installed in all angles between 90° and 45°.

> In case of multiple penetrations of maximum three plastic pipes (linear arrangement, no clusters) according to clause 2.1 of the ETA made from PVC-U, PE-HD or PP with diameters and wall thicknesses as defined in Annex D-15 and Annex F-17 of the ETA equipped with one concerted pipe collar "Pacifyre® EFC" which are installed in vertical separating elements the plastic pipes shall only be positioned in horizontal direction. For details see Annex C-7 and Annex E-8 of the ETA.

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-1** |

## 1.3 Service support constructions

> All metal pipes and plastic pipes – in flexible walls and rigid walls – have to be supported on both sides of the separating element by service support constructions (e.g. pipe hangers) made of metal with a melting or decomposition point greater or equal than 945 °C for EI 60, 1006 °C for EI 90 or 1049 °C for EI 120 (e.g. stainless steel or galvanized steel) according to the ETA-holder's installation instructions.

> All metal pipes and plastic pipes – in rigid floors – have to be supported at least on the top side of the separating element by service support constructions (e.g. pipe hangers) made of metal with a melting or decomposition point greater or equal than 945 °C for EI 60, 1006 °C for EI 90, 1049 °C for EI 120, 1110 °C for EI 180 or 1153 °C for EI 240 (e.g. stainless steel or galvanized steel) according to the ETA-holder's installation instructions.

> The first support (service support construction) for metal pipes and plastic pipes in flexible walls and rigid walls has to be at maximum 650 mm (measured from the surface of the separating element).

> The first support (service support construction) for metal pipes in flexible walls and rigid walls – where "Pacifyre® EFC" is installed on both sides to the surface of the separating element (see Annex C-9 of the ETA) and where "Pacifyre® EFC" is installed on both sides flushed within the separating element (without "Pacifyre® EFC Hook"; see Annex C-11 of the ETA) – has to be at maximum 500 mm (measured from the surface of the separating element).

> The first support (service support construction) for plastic pipes in flexible walls and rigid walls – where "Pacifyre® EFC" is installed on both sides flushed within the separating element (without "Pacifyre® EFC Hook"; see Annex C-5 and Annex C-8 of the ETA) – has to be at maximum 500 mm (measured from the surface of the separating element).

> The first support (service support construction) for PE-HD pipes, PP pipes and PVC-U pipes with a diameter ≤ 40 mm in flexible walls and rigid walls – where "Pacifyre® IM 3" is installed on both sides flushed within the separating element (without "Pacifyre® EFC Band"; see Annex C-6 of the ETA) – has to be at maximum 500 mm (measured from the surface of the separating element).

> The first support (service support construction) for metal pipes in rigid floors has to be at maximum 550 mm (measured from the surface of the separating element).

> The first support (service support construction) for plastic pipes in rigid floors has to be at maximum 400 mm (measured from the surface of the separating element).

> All metal pipes and plastic pipes have to be fixed according to the ETA-holder's installation instructions to the service support construction.

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-2** |

## 2 Details for installation of "Pacifyre® EFC System" (see Annex B to F-18 of the ETA)

> "Pacifyre® EFC System" has to be installed according to the ETA-holder's installation instructions.

### 2.1 Plastic pipes and metal pipes in vertical separating elements

> For plastic pipes in vertical separating elements the pipe collar "Pacifyre® EFC" has to be installed on both sides to the surface of the separating element (see Annex C-1 to Annex C-4 and Annex C-7 of the ETA) or in some cases on both sides flushed within the separating element (without "Pacifyre® EFC Hook"; see Annex C-5, Annex C-8, Annex D-15, Annex D-16 and Annex D-17 of the ETA). For PE-HD pipes, PP pipes and PVC-U pipes with a diameter ≤ 40 mm in some cases "Pacifyre® IM 3" has to be installed on both sides flushed within the separating element (without "Pacifyre® EFC Band"; see Annex C-6, Annex D-15, Annex D-16 and Annex D-17 of the ETA).

> For metal pipes in vertical separating elements "Pacifyre® IM 2" or "Pacifyre® IM 3" has to be installed on both sides flushed within the separating element (without "Pacifyre® EFC Band"; see Annex C-10, Annex C-12, Annex D-18 and Annex D-19 of the ETA). In some cases the pipe collar "Pacifyre® EFC" has to be installed on both sides to the surface of the separating element (see Annex C-9 and Annex D-18 of the ETA) or on both sides flushed within the separating element (without "Pacifyre® EFC Hook"; see Annex C-11 and Annex D-19 of the ETA).

### 2.2 Plastic pipes and metal pipes in horizontal separating elements

> For plastic pipes in horizontal separating elements the pipe collar "Pacifyre® EFC" has to be installed on the bottom side to the surface of the separating element (see Annex E-1 to Annex E-8 of the ETA).

> For metal pipes in horizontal separating elements two "Pacifyre® IM 2" or "Pacifyre® IM 3" which have to be arranged one behind the other have to be installed on the bottom side flushed within the separating element (without "Pacifyre® EFC Band"; see Annex E-9, Annex F-17 and Annex F-18 of the ETA).

> For steel pipes and stainless steel pipes a pipe collar "Pacifyre® EFC" can alternatively be installed on the bottom side to the surface of the separating element (see Annex E-10 and Annex F-18 of the ETA).

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-3** |

## 2.3 Installation of "Pacifyre® IM 2" and "Pacifyre® IM 3"

> The metal pipes and plastic pipes to be sealed off have to be wrapped with "Pacifyre® IM 2" or "Pacifyre® IM 3" with the corresponding number of layers as specified in Annex D-1 to Annex D-19 and Annex F-1 to Annex F-18 of the ETA.

> It is not allowed to combine "Pacifyre® IM 2" and "Pacifyre® IM 3" in one penetration seal.

> If metal pipes or plastic pipes are insulated with "AF/Armaflex", "SH/Armaflex" or Polyethylene sound insulation (e.g. "THERMACOMPACT TF™") according to clause 1 of the ETA "Pacifyre® IM 2" or "Pacifyre® IM 3" has to be wrapped around the insulation.

## 2.4 Installation of "Pacifyre® EFC Band"

> If metal pipes or plastic pipes have to be equipped with pipe collar "Pacifyre® EFC", the intumescent inlay "Pacifyre® IM 2" or "Pacifyre® IM 3" has to be fixed by one layer of "Pacifyre® EFC Band" (see Annex C-1 to Annex C-4, Annex C-7, Annex C-9, Annex E-1 to Annex E-8 and Annex E-10 of the ETA). The "Pacifyre® EFC Band" has to be fixed with at least the corresponding number of "Pacifyre® EFC Hook" and the corresponding means of fixation (e.g. threaded steel bolts) to the separating element as specified below (except "Pacifyre® EFC Hook" is not required; see Annex C-5, Annex C-8 and Annex C-11 of the ETA).

| Separating element | Orientation | Pipe outer diameter (mm) | Minimum number of Pacifyre® EFC Hook |
|---|---|---|---|
| Flexible wall | perpendicular | ≤ 50 | 2 |
| | perpendicular | > 50 to ≤ 110 | 3 |
| | perpendicular | > 110 to ≤ 160 | 4 |
| | angle between 90° and 45° | ≤ 50 | 3 |
| | angle between 90° and 45° | > 50 to ≤ 110 | 4 |
| | angle between 90° and 45° | > 110 to ≤ 160 | 6 |
| Rigid wall or Rigid floor | perpendicular | ≤ 50 | 2 |
| | perpendicular | > 50 to ≤ 110 | 3 |
| | perpendicular | > 110 | 4 |
| | angle between 90° and 45° | ≤ 50 | 3 |
| | angle between 90° and 45° | > 50 to ≤ 110 | 4 |
| | angle between 90° and 45° | > 110 to ≤ 160 | 6 |

> In case of metal pipes where "Pacifyre® EFC" is installed on both sides to the surface of the separating element (see Annex C-9 and Annex D-18 of the ETA) the minimum number of "Pacifyre® EFC Hook" shall be taken from the following table.

| Separating element | Orientation | Pipe outer diameter (mm) | Minimum number of Pacifyre® EFC Hook |
|---|---|---|---|
| Flexible wall and Rigid wall | perpendicular | ≤ 54 | 3 |
| | perpendicular | ≥ 54 to ≤ 108 | 4 |

**Pacifyre® EFC System**

**- Details for installation -**

**ANNEX A-4**

2.4.1 Installation of “Pacifyre® EFC Band” in case of flexible walls acc. to cl. 2.1 of the ETA

> The “Pacifyre® EFC Band” has to be installed on both sides of the flexible wall.

> The minimum number of “Pacifyre® EFC Hook” has to be taken from the tables above.

> The “Pacifyre® EFC Hook” shall be distributed equally around the pipe to be sealed off.

> In case of multiple penetrations of maximum three plastic pipes (clearance between pipes maximum 15 mm; linear arrangement, no clusters) according to clause 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar “Pacifyre® EFC” between each pipe one “Pacifyre® EFC Hook” on the top side and the bottom side of the “Pacifyre® EFC Band” has to be installed.

> The “Pacifyre® EFC Band” has to be fixed by threaded steel bolts (outer diameter 6 mm to 8 mm – for pipes with outer diameter ≤ 50 mm or 8 mm – for pipes with outer diameter > 50 mm; length ≥ thickness of the separating element) and on both sides of the separating element with washers and nuts (corresponding to the outer diameter of the threaded steel bolts).

2.4.2 Installation of “Pacifyre® EFC Band” in case of rigid walls and rigid floors acc. to cl. 2.1 of the ETA

> The “Pacifyre® EFC Band” has to be installed on both sides of the rigid wall.

> The “Pacifyre® EFC Band” has to be installed on the bottom side of the rigid floor.

> The minimum number of Pacifyre® EFC Hook” has to be taken from the tables above.

> The “Pacifyre® EFC Hook” shall be distributed equally around the pipe to be sealed off.

> In case the “Pacifyre® EFC Band” is installed on a vertical plastic pipe which is positioned directly in the corner of the wall (clearance between pipe and wall maximum 10 mm) three “Pacifyre® EFC Hook” have to be used (one “Pacifyre® EFC Hook” in each corner and one in the middle of the “Pacifyre® EFC Band”).

> In case of multiple penetrations of maximum three plastic pipes (clearance between pipes maximum 15 mm; linear arrangement, no clusters) according to clause 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar “Pacifyre® EFC” between each pipe one “Pacifyre® EFC Hook” on the top side and the bottom side of the “Pacifyre® EFC Band” has to be installed.

> The “Pacifyre® EFC Band” has to be fixed by appropriate steel dowels resp. steel screw anchors (outer diameter ≥ 6 mm) and washers (corresponding to the outer diameter of the steel dowels resp. steel screw anchors). In case of aerated concrete the “Pacifyre® EFC Band” can alternatively be fixed by steel dry-wall screws (outer diameter ≥ 5 mm; length ≥ 50 mm) and washers (corresponding to the outer diameter of the steel dry-wall screws).

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-5** |

## 2.5 Insulation

> Metal pipes according to Annex D-18, Annex D-19, Annex F-17 and Annex F-18 of the ETA have to be insulated with “AF/Armaflex”.

> Plastic pipes can be insulated with “AF/Armaflex”, “SH/Armaflex” or Polyethylene sound insulation (e.g. “THERMACOMPACT TF™”) according to clause 1 of the ETA. In some cases it is mandatory to insulate the plastic pipes. For details see Annex D-1 to Annex D-19 and Annex F-1 to Annex F-18 of the ETA.

2.5.1 Installation of “AF/Armaflex” or “SH/Armaflex”

> The thickness of the tube has to correspond with the provisions given in Annex D-1 to Annex D-19 and Annex F-1 to Annex F-18 of the ETA.

> The length of the tube of has to be ≥ 500 mm (local-sustained LS or continued-sustained CS) on both sides of the separating element (measured from the surface of the separating element).

> The tube has to be continuous along the required minimum insulation length.

> When installing the tubes all butt joints and longitudinal joints (except for tubes with self-adhesive device) have to be glued with “Armaflex 520” and can be covered with “AF/Armaflex Band selbstklebend” (AF/Armaflex self-adhesive tape) or “SH/Armaflex Band selbstklebend” (SH/Armaflex self-adhesive tape).

> The amount of “Armaflex 520” shall not be more than given in the technical literature of the manufacturer.

> The strip of “AF/Armaflex Band selbstklebend” (AF/Armaflex self-adhesive tape) or “SH/Armaflex Band selbstklebend” (SH/Armaflex self-adhesive tape) have to be 50 mm x 3 mm (width x thickness).

> Branches or elbows also have to be equipped with tubes along the required minimum insulation length (≥ 500 mm – measured from the surface of the separating element) on both sides of the separating element.

> For further details see technical literature of the manufacturer.

2.5.2 Installation of Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA

> The tubes can either be pushed onto the pipe or slotted and wrapped around the pipe.

> The pipes can be insulated in the penetration area exclusively (flushed within the penetration seal) as well as at their complete length.

> As the dimensions of the tubes are given, the excess insulation material can be partially (on width between 20 mm to 40 mm) folded over the other at one point so that the thickness becomes 12 mm.

> For further details see technical literature of the manufacturer.

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-6** |

## 2.6 Annular gap

> The annular gap (maximum width 30 mm) between the penetrating elements (metal pipes and plastic pipes – including insulation) and the vertical separating element has to be completely filled with “Gap Filler” according to clause 1 of the ETA on both sides of the separating element. In some cases the annular gap between the metal pipes (including insulation) and the vertical separating element shall be 0 mm and therefore no sealing of the annular gap is needed (see Annex C-9 and Annex D-18 of the ETA).

> In case of metal pipes where “Pacifyre® EFC” is installed flushed on both sides within the separating element (without “Pacifyre® EFC Hook”), the annular gap (maximum width 30 mm) between the metal pipes (including insulation) and the vertical separating element has be to be filled to depth of minimum 25 mm with “Pacifyre® FPM” according to clause 1 of the ETA on both sides of the separating element and backfilled with mineral wool – stone wool according to EN 14303 with classification A1 according to EN 13501-1 and a minimum apparent density of 100 kg/m³ – according to clause 1 of the ETA (for details see Annex C-11 and Annex D-19 of the ETA).

> In case of plastic pipes where “Pacifyre® EFC” is installed flushed on both sides within the separating element (without “Pacifyre® EFC Hook”), the annular gap (maximum width 15 mm) between the plastic pipes (without insulation) and the vertical separating element has be to be filled to depth of minimum 25 mm with “Pacifyre® A”, “Pacifyre® S” or “Pacifyre® H” according to clause 1 of the ETA on both sides of the separating element and backfilled with mineral wool – stone wool according to EN 14303 with classification A1 according to EN 13501-1 and a minimum apparent density of 100 kg/m³ – according to clause 1 of the ETA (for details see Annex C-5, Annex C-8, Annex D-15, Annex D-16 and Annex D-17 of the ETA).

> In case of PE-HD pipes, PP pipes and PVC-U pipes with a diameter ≤ 40 mm where “Pacifyre® IM 3” has to be installed on both sides flushed within the separating element (without “Pacifyre® EFC Band”), the annular gap (maximum width 15 mm) between the plastic pipes (without insulation) and the vertical separating element has be to be filled to depth of minimum 25 mm with “Pacifyre® A”, “Pacifyre® S” or “Pacifyre® H” according to clause 1 of the ETA on both sides of the separating element and backfilled with mineral wool – stone wool according to EN 14303 with classification A1 according to EN 13501-1 and a minimum apparent density of 100 kg/m³ – according to clause 1 of the ETA (for details see Annex C-6, Annex D-15, Annex D-16 and Annex D-17 of the ETA).

> In case of non-insulated flexible walls it has to be ensured that the cavity of the flexible wall around the annular gap is filled to a depth of ≥ 100 mm with stone wool with classification A2-s1,d0 or A1 according to EN 13501-1.

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-7** |

> The annular gap (maximum width 50 mm) between the penetrating elements (metal pipes and plastic pipes – including insulation) and the horizontal separating element has to be completely filled with “Gap Filler” according to clause 1 of the ETA on both sides of the separating element.

> The annular gap (maximum width 50 mm) between plastic pipes (including insulation) “Wavin SiTech+”, “Geberit Silent-PP”, “POLO-KAL NG” or “RAUPIANO PLUS” and the horizontal separating element can alternatively be completely filled with “Pacifyre® FPF” according to clause 1 of the ETA on both sides of the separating element.

**3 Minimum working clearances**

> The minimum clearance between two non-insulated pipes (linear arrangement, no clusters) is 100 mm (measured from the surface of the pipe).

> The minimum clearance between two metal pipes (linear arrangement, no clusters) in flexible walls and rigid walls – where “Pacifyre® EFC” is installed on both sides to the surface of the separating element (see Annex C-9 and Annex D-18 of the ETA) and where “Pacifyre® EFC” is installed on both sides flushed within the separating element (without “Pacifyre® EFC Hook”; see Annex C-11 and Annex D-19 of the ETA) – is 200 mm (measured from the surface of the insulation).

> The minimum clearance between two plastic pipes (linear arrangement, no clusters) in flexible walls and rigid walls – where “Pacifyre® EFC” is installed on both sides flushed within the separating element (without “Pacifyre® EFC Hook”; see Annex C-5, Annex D-15, Annex D-16 and Annex D-17 of the ETA) – is 200 mm (measured from the surface of the pipe).

> The minimum clearance between two PE-HD pipes, PP pipes and PVC-U pipes with a diameter ≤ 40 mm (linear arrangement, no clusters) in flexible walls and rigid walls – where “Pacifyre® IM 3” is installed on both sides flushed within the separating element (without “Pacifyre® EFC Band”; see Annex C-6, Annex D-15, Annex D-16 and Annex D-17 of the ETA) – is 200 mm (measured from the surface of the pipe).

> The minimum clearance between two pipes (linear arrangement, no clusters) insulated with “AF/Armaflex”, “SH/Armaflex” or Polyethylene sound insulation (e.g. “THERMACOMPACT TF™”) according to clause 1 of the ETA is 100 mm (measured from the surface of the insulation).

> For multiple penetrations the minimum clearance between maximum three plastic pipes (linear arrangement, no clusters) according to clause 2.1 of the ETA made from PVC-U, PE-HD or PP with diameters and wall thicknesses as defined in Annex D-15 and Annex F-17 of the ETA equipped with one concerted pipe collar “Pacifyre® EFC” is 0 mm (measured from the surface of the pipe).

> In some cases, for PE-HD pipes – where “Pacifyre® EFC” is installed on both sides flushed within the separating element (without “Pacifyre® EFC Hook”; see Annex C-8 and D-17 of the ETA) – the minimum distance between two PE-HD pipes (linear arrangement, no clusters) in flexible walls and rigid walls can be 0 mm (measured from the surface of the pipe collar “Pacifyre® EFC”).

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-8** |

## 4 Transport and storage

> The indications of the manufacturer regarding transport and storage (minimum and maximum storing temperature, maximum duration of storage) have to be followed.

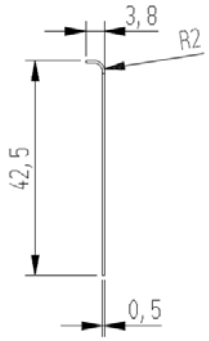
## 5 Use, maintenance and repair

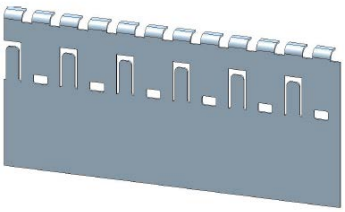
> The fire resistance of the penetration seal shall not be negatively affected by future changes to buildings or building elements.

> The assessment of the fitness for use is based on the assumption that necessary maintenance and repair if required is carried out in accordance with the manufacturer's instructions during the assumed intended working life.

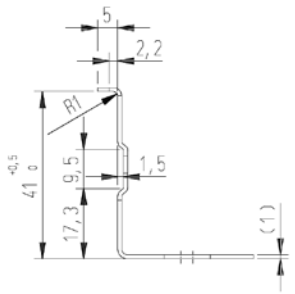
| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Details for installation -** | **ANNEX A-9** |

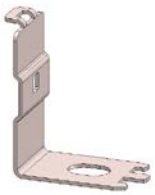
**Pipe collar “Pacifyre® EFC”**



**Pacifyre® EFC Band**



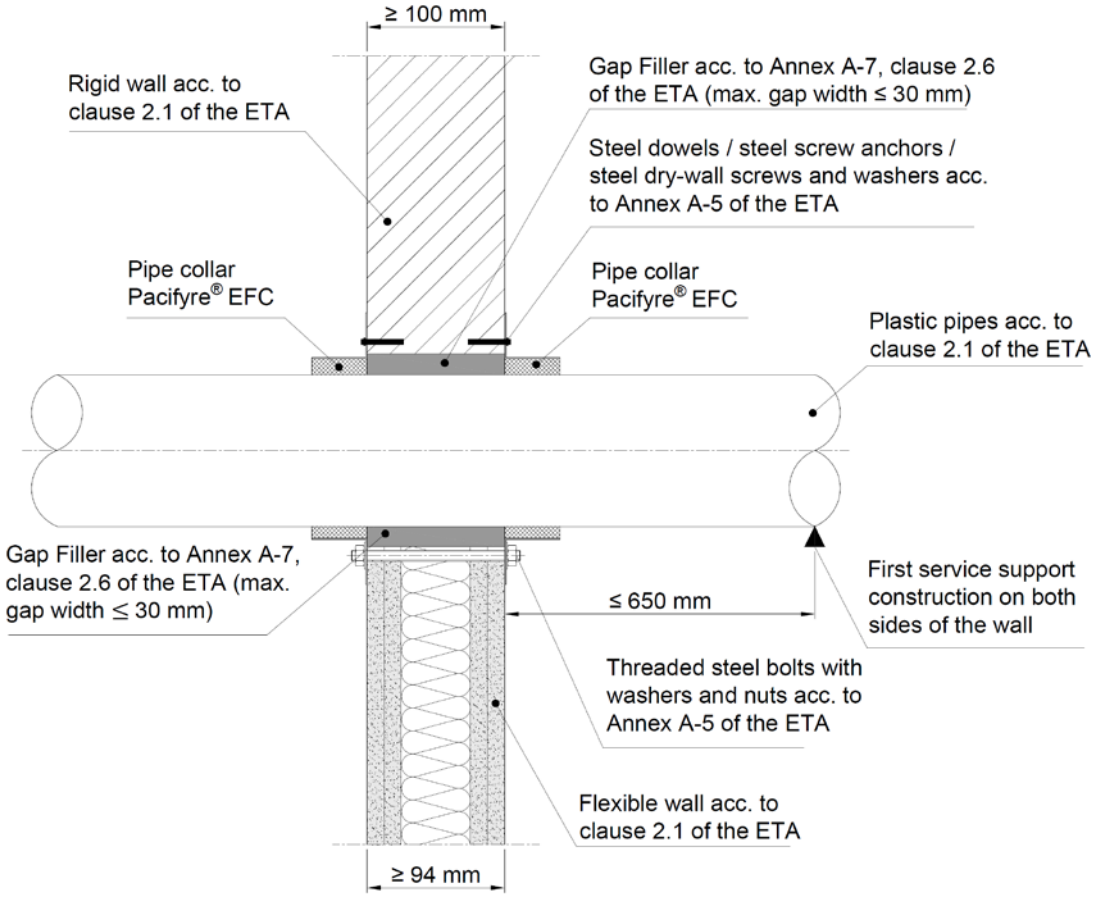



**Pacifyre® EFC Hook**

**- Description of pipe collar “Pacifyre® EFC” -**

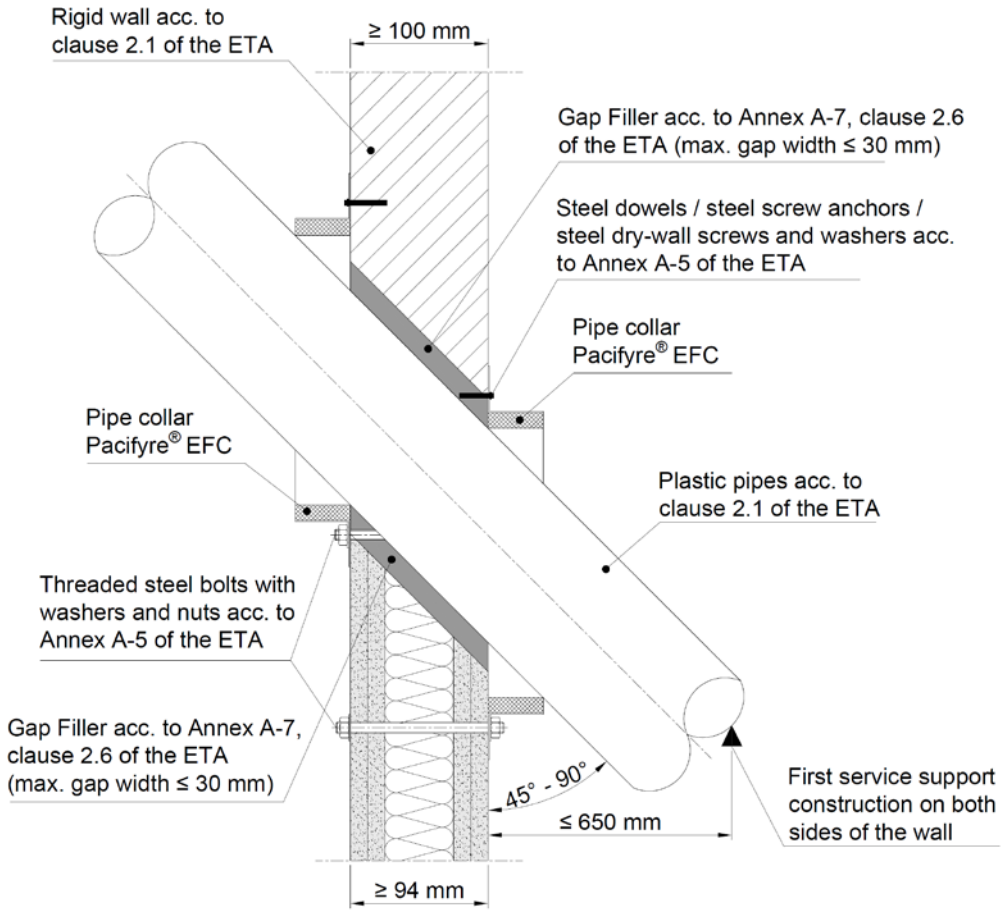
**ANNEX B**

**Plastic pipes according to clause 2.1 of the ETA, non-insulated – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – Installation drawing – sectional view**



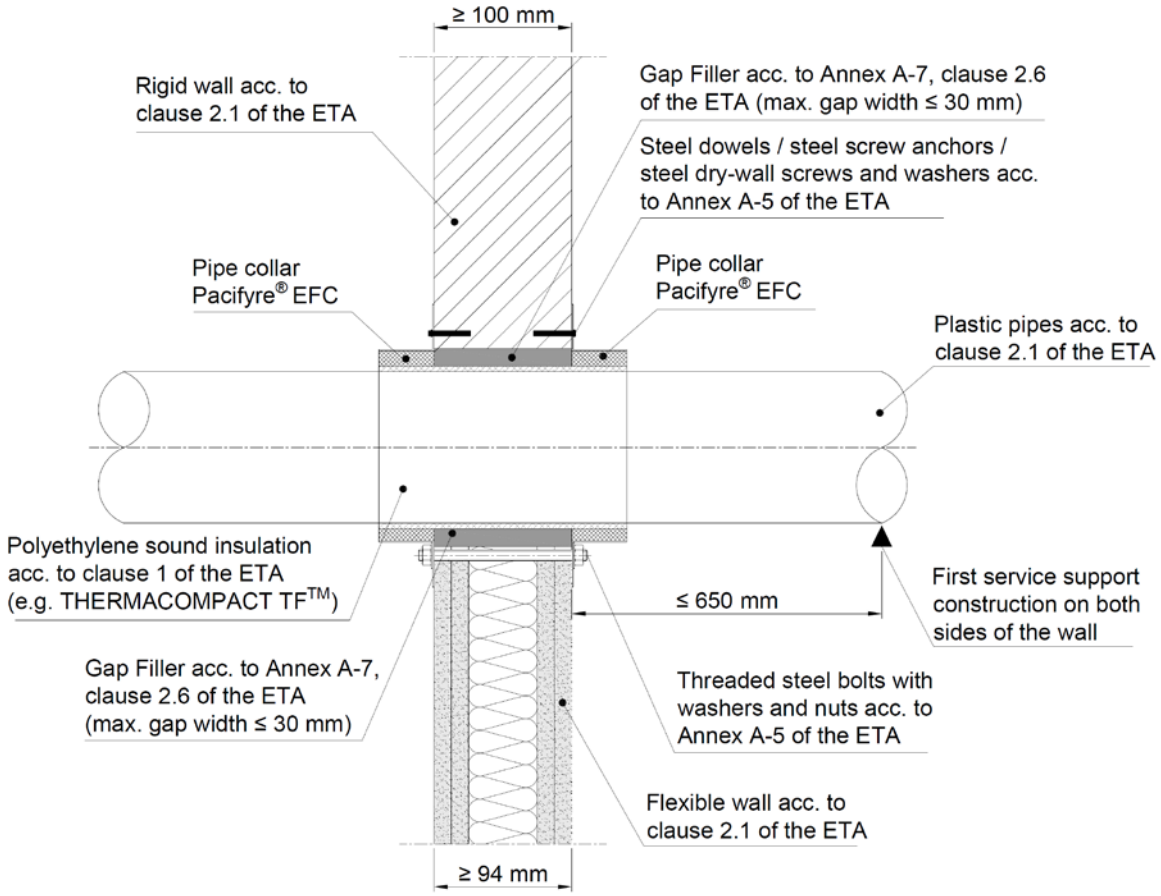

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-1** |

**Plastic pipes according to clause 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – Installation drawing – sectional view**



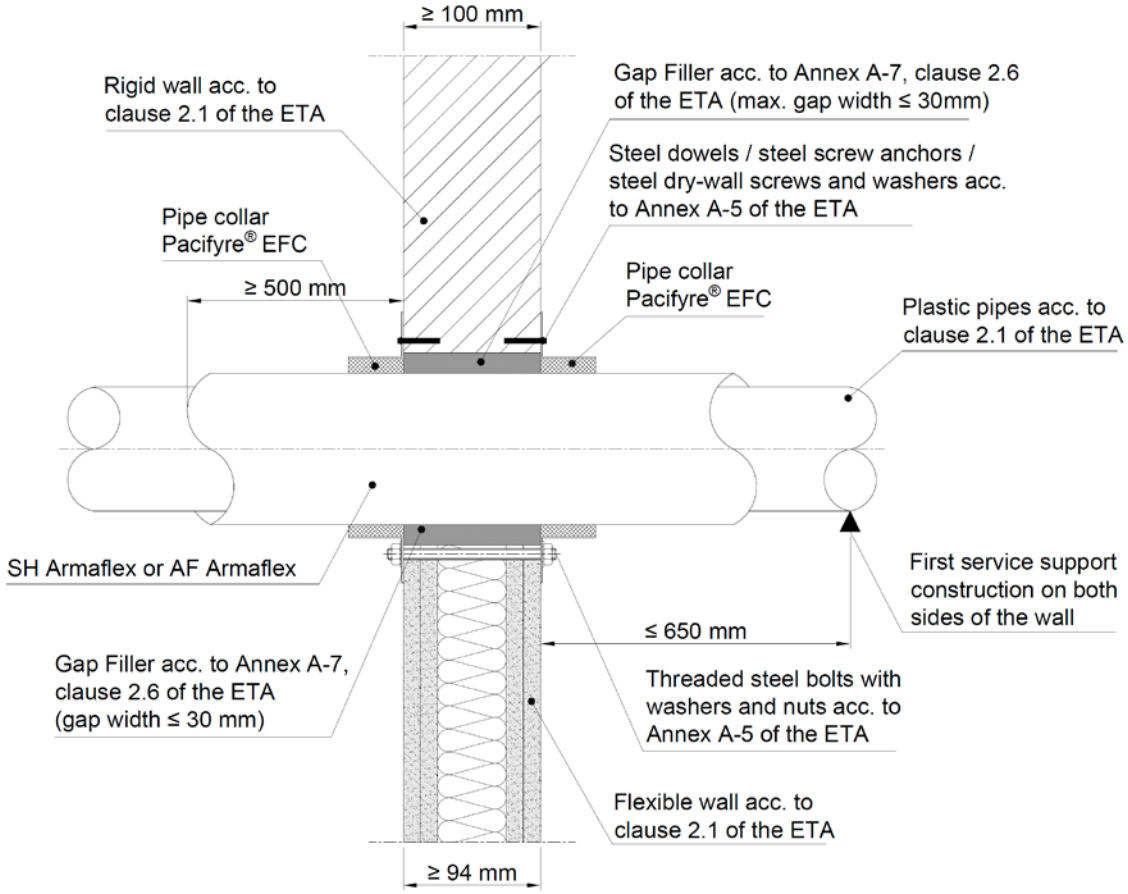

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-2** |

**Plastic pipes according to clause 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – Installation drawing – sectional view**



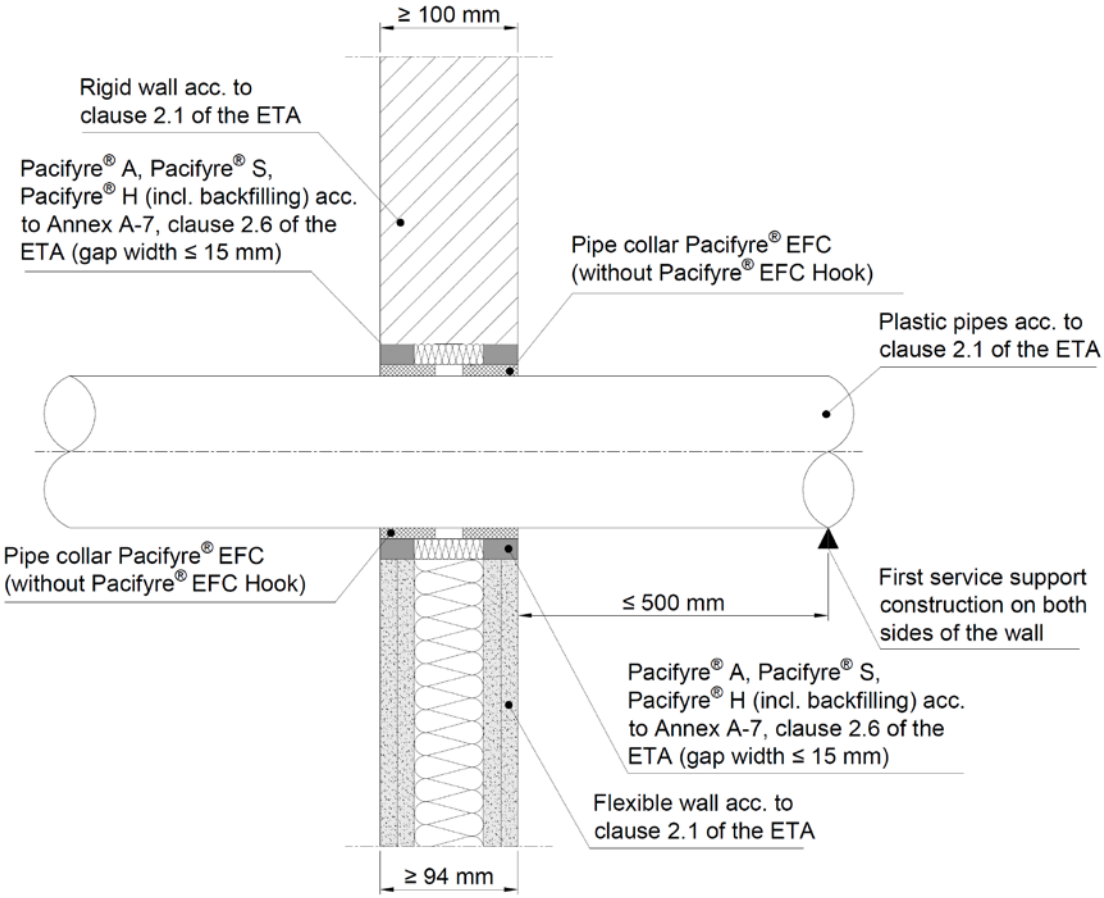

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-3** |

**Plastic pipes according to clause 2.1 of the ETA, insulated with SH/Armaflex or AF/Armaflex – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – Installation drawing – sectional view**



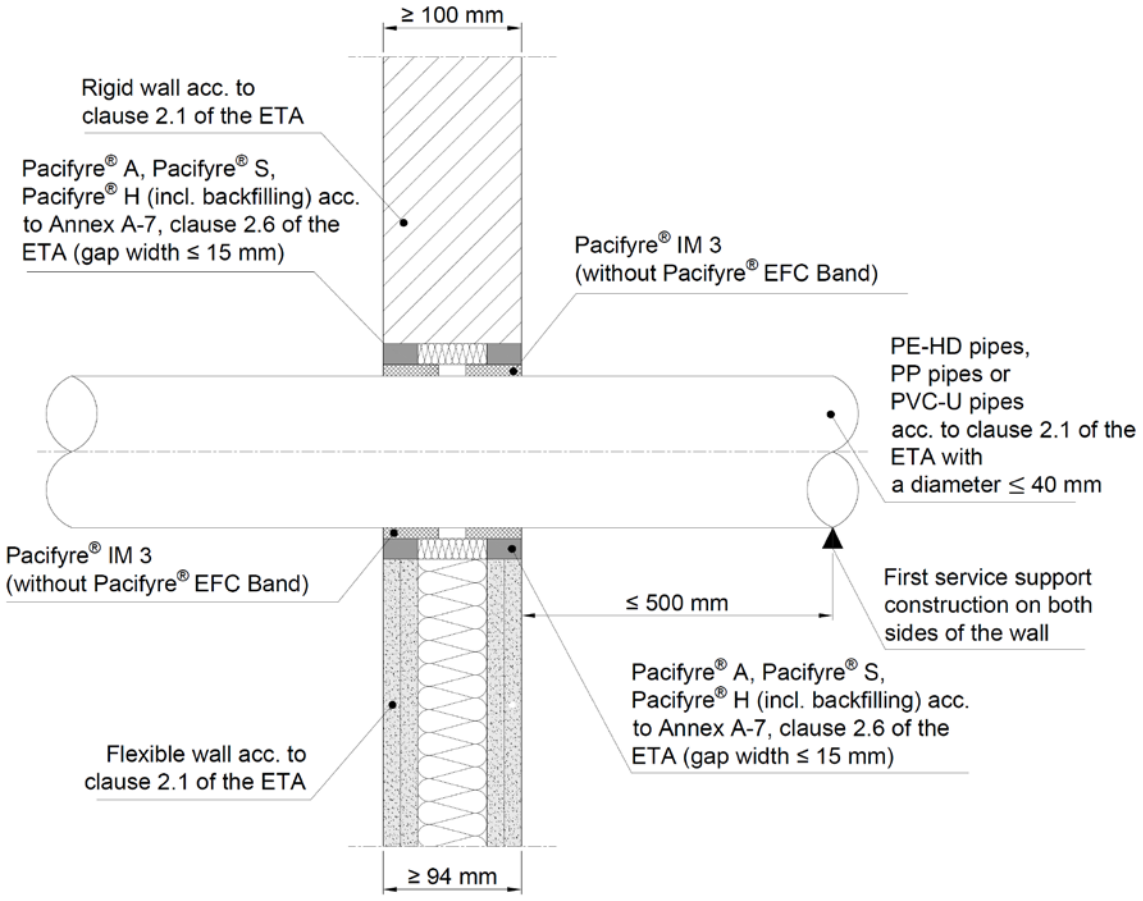

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-4** |

**Plastic pipes according to clause 2.1 of the ETA, non-insulated – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H – Installation drawing – sectional view**



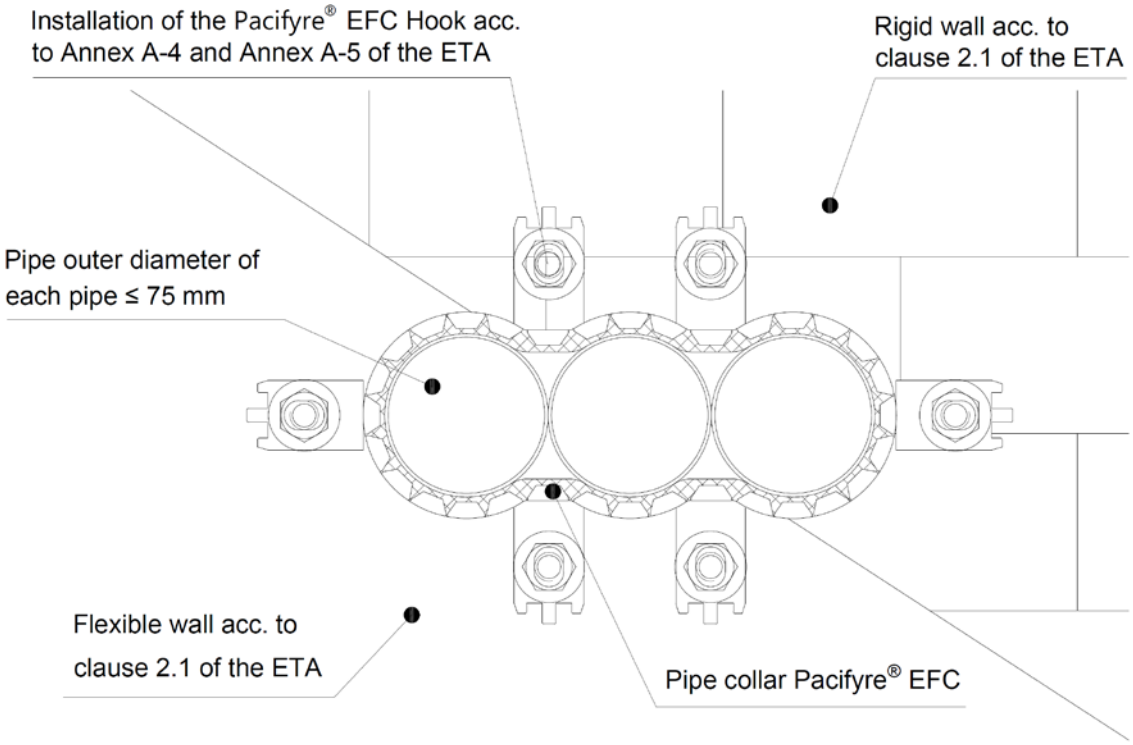

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-5** |

**PE-HD pipes, PP pipes or PVC-U pipes according to clause 2.1 of the ETA with a diameter ≤ 40 mm, non-insulated – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H – Installation drawing – sectional view**



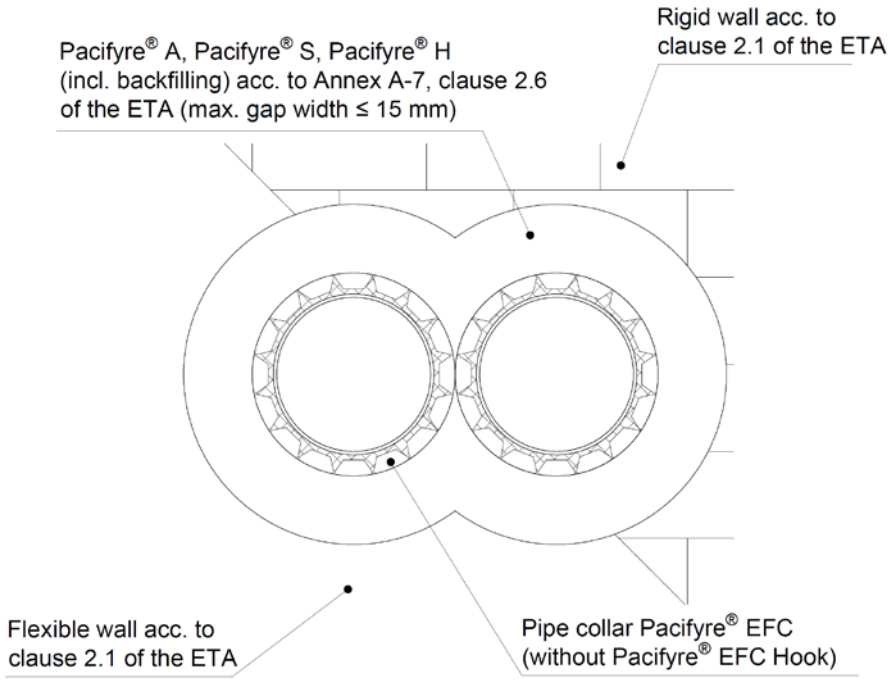

| Pacifyre® EFC System<br>- Installation in flexible wall and rigid wall - | ANNEX C-6 |
|---|---|

**Multiple penetration of maximum three plastic pipes acc. to cl. 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar Pacifyre® EFC (clearance between pipes maximum 15 mm; linear arrangement, no clusters), non-insulated – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – Installation drawing – top view**



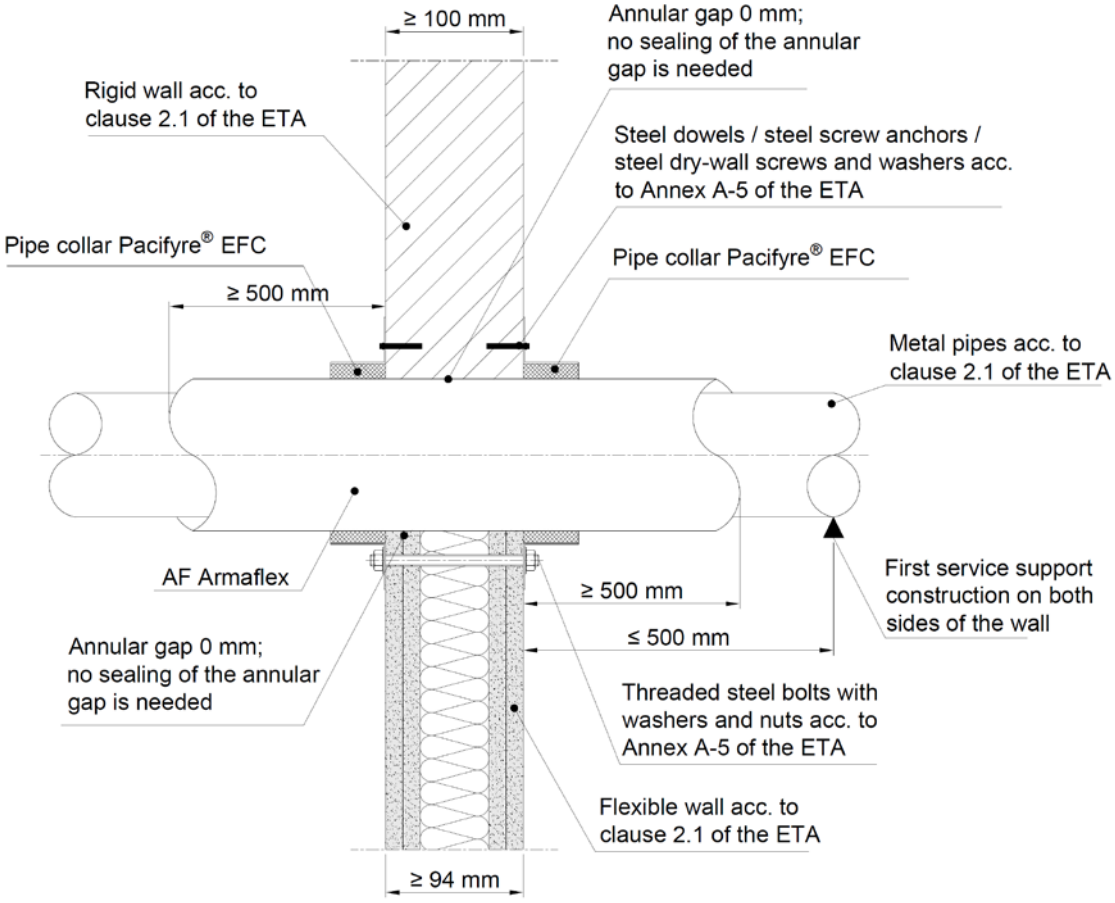

| Pacifyre® EFC System<br>- Installation in flexible wall and rigid wall - | ANNEX C-7 |
|---|---|

**PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – the minimum distance between two PE-HD pipes is 0 mm (measured from the surface of the pipe collar Pacifyre® EFC) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H – Installation drawing – top view**



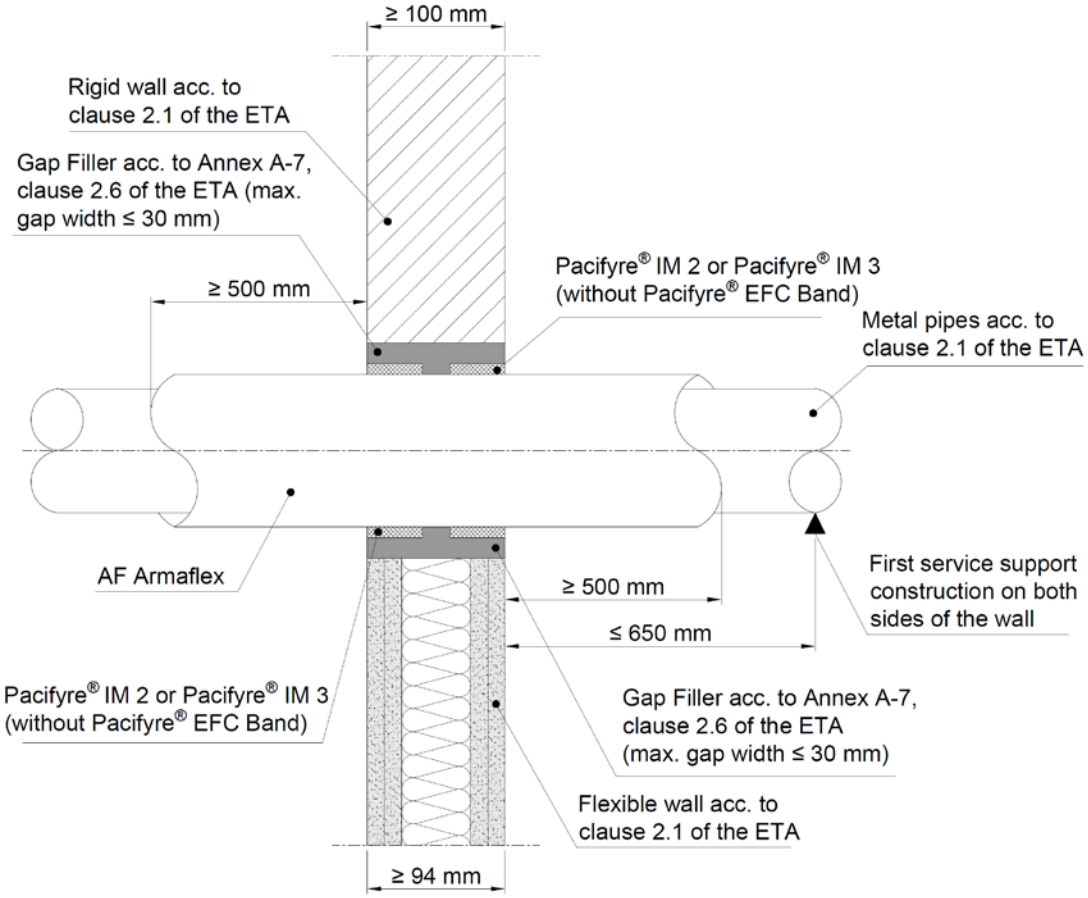

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-8** |

**Metal pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – the annular gap between the metal pipes (including insulation) and the vertical separating element is 0 mm (no sealing of the annular gap is needed) – Installation drawing – sectional view**



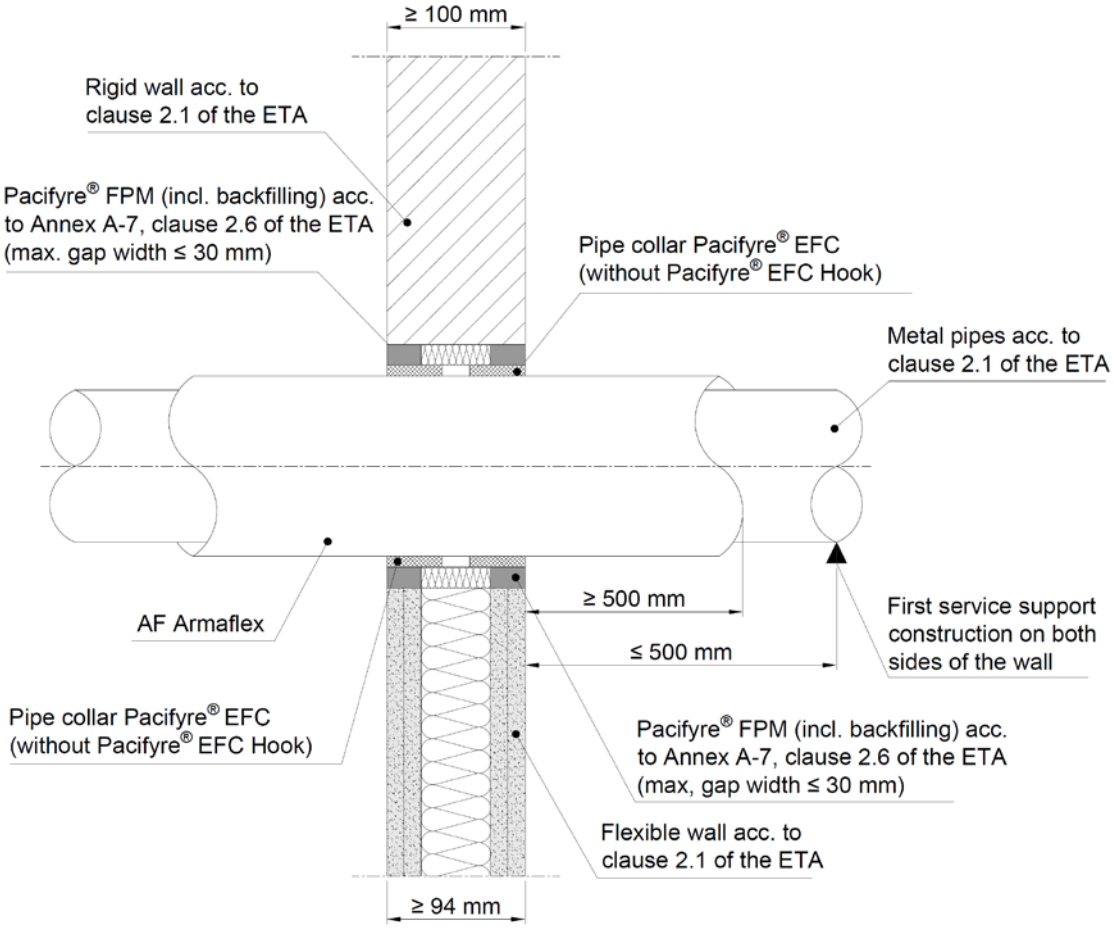

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-9** |

**Metal pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® IM 2 or Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – Installation drawing – sectional view**



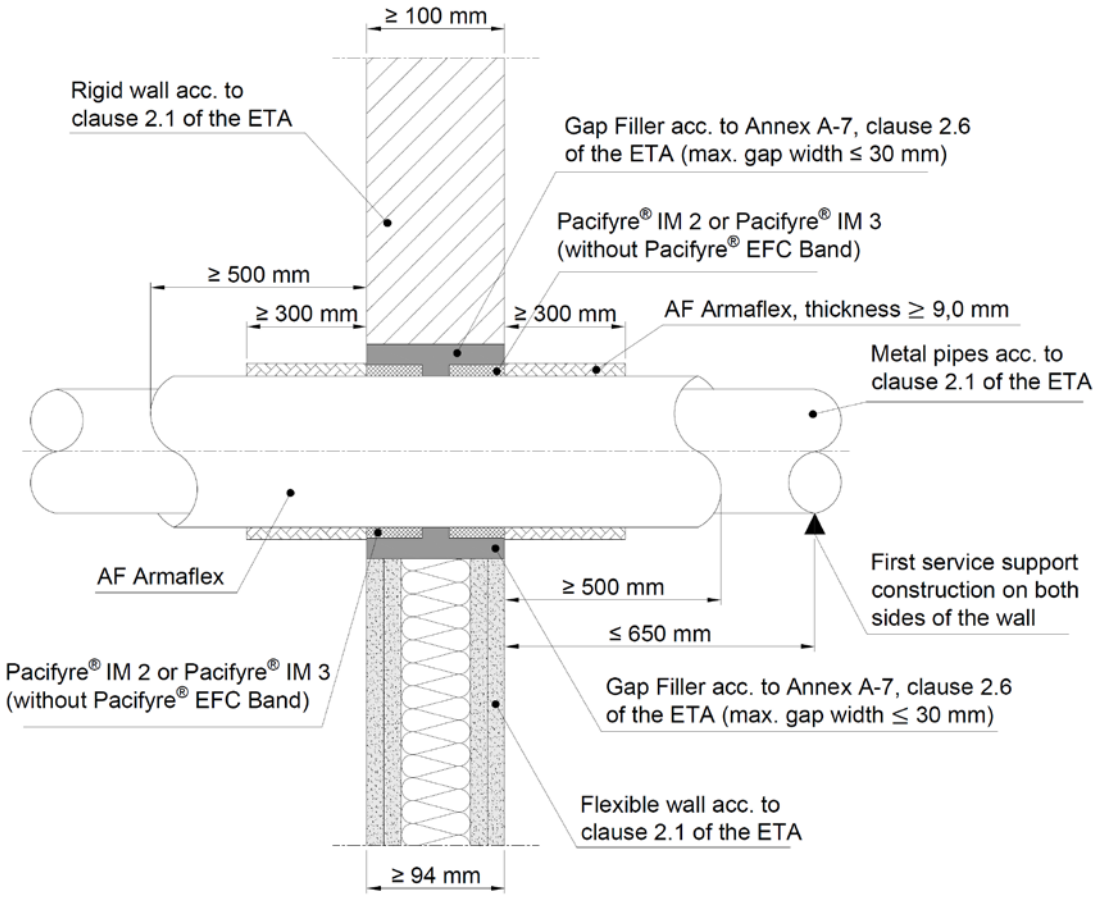

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-10** |

**Metal pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® FPM – Installation drawing – sectional view**




| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-11** |

**Metal pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex and an additional layer of AF/Armaflex – in flexible walls and rigid walls according to clause 2.1 of the ETA – Pacifyre® IM 2 or Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – Installation drawing – sectional view**




| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in flexible wall and rigid wall -** | **ANNEX C-12** |

| PVC-U pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 5,6 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 1,8 to 12,3 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 125 | 2,2 to 12,2 | --- | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 3,2 to 11,9 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |

| PVC-U pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 5,6 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 1,8 to 12,3 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 125 | 2,2 to 12,2 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 3,2 to 11,9 | --- | X | X | 8 | EI 90-U/C<br>E 90-U/C |

--- … no insulation allowed
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-1**

| PVC-U pipes acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| **Pipe dimensions (mm)** | | **Insulation thickness (mm)** | **Intumescent inlay** | | | **Fire resistance classification** |
| **Outer diameter** | **Wall thickness** | | **Pacifyre® IM 3** | **Pacifyre® IM 2** | **Nr. of layers** | |
| ≤ 50 | 1,8 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 | ≤ 4 | X | X | 5 | EI 90-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 1,8 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| > 110 to ≤ 125 | 1,8 to 2,2 | ≤ 4 | X | X | 6 | EI 90-U/C<br>E 120-U/C |
| ≤ 50 | 1,8 to 5,6 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| > 50 to ≤ 75 | 1,8 to 8,4 | ≤ 4 | --- | X | 3 | EI 90-U/U<br>E 120-U/U |
| > 75 to ≤ 110 | 1,8 to 11,9 | ≤ 4 | --- | X | 4 | EI 90-U/U<br>E 120-U/U |
| > 110 to ≤ 125 | 3,2 to 11,9 | ≤ 4 | --- | X | 5 | EI 90-U/U<br>E 120-U/U |
| > 125 to ≤ 160 | 3,2 to 11,9 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-2**

| PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 4,6 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 2,7 to 10,0 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | 4,0 | --- | X | X | 8 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | > 4,0 to 14,6 | --- | X | X | 8 | EI 60-U/C<br>E 60-U/C |

| PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 | --- | X | X | 4 | EI 90-U/C<br>E 90-U/C |
| > 75 to ≤ 110 | 2,7 | --- | X | X | 5 | EI 90-U/C<br>E 90-U/C |
| > 110 to ≤ 125 | 3,2 | --- | X | X | 7 | EI 90-U/C<br>E 90-U/C |
| > 125 to ≤ 160 | 4,0 | --- | X | X | 8 | EI 90-U/C<br>E 90-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-3 |
|---|---|

| PE-HD pipes acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| **Pipe dimensions (mm)** | | **Insulation thickness (mm)** | **Intumescent inlay** | | | **Fire resistance classification** |
| **Outer diameter** | **Wall thickness** | | **Pacifyre® IM 3** | **Pacifyre® IM 2** | **Nr. of layers** | |
| ≤ 50 | 1,8 to 4,6 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 to 6,8 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 1,8 to 10,0 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | 4,0 | ≤ 4 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | > 4,0 to 14,6 | ≤ 4 | X | X | 6 | EI 90-U/C<br>E 120-U/C |
| ≤ 50 | 1,8 to 4,6 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| > 50 to ≤ 75 | 2,7 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| > 75 to ≤ 110 | 2,7 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-4**

| PP pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 4,6 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 2,7 to 10,0 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | 4,0 | --- | X | X | 8 | EI 90-U/C<br>E 120-U/C |
| > 110 to ≤ 160 | > 4,0 to 14,6 | --- | X | X | 6 | EI 90-U/C<br>E 90-U/C |

| PP pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 75 | 1,8 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 2,7 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| PP pipes acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 4,6 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| > 50 to ≤ 75 | 1,8 to 2,7 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| > 75 to ≤ 110 | 2,7 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-5 |
|---|---|

| Plastic pipes alpex F50 PROFI acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes alpex F50 PROFI and alpex L acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | 9,0 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 4,0 | 10,0 | X | X | 3 | EI 60-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | 9,0 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | > 9,0 to 20,0 | X | X | 5 | EI 90-U/C<br>E 90-U/C |
| ≤ 75 | 5,0 | > 20,0 to 30,0 | X | X | 6 | EI 90-U/C<br>E 90-U/C |
| ≤ 75 | 5,0 | > 30,0 to 44,0 | X | X | 6 | EI 90-U/C<br>E 120-U/C |

| Plastic pipes alpex F50 PROFI and alpex L acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 75 | 5,0 | 9,5 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | > 9,5 to 20,0 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | > 20,0 to 30,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| **Pacifyre® EFC System**<br>**- Fire resistance classification -** | **ANNEX D-6** |
|---|---|

| Plastic pipes BluePower® acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,5 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-7**

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | 9,0 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 4,5 | 10,0 | X | X | 3 | EI 60-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | 9,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | > 9,0 to 20,0 | X | X | 6 | EI 90-U/C<br>E 120-U/C |

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 4,5 | 27,5 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | 9,5 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | 19,0 | X | X | 6 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | 30,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| **Pacifyre® EFC System**<br>**- Fire resistance classification -** | **ANNEX D-8** |
|---|---|

| Plastic pipes Wavin SiTech+ acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 5,3 | ≤ 4 | X | X | 8 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-9**

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,2 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 6,9 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 6,9 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 15,2 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,2 | 9,0 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 6,9 | 10,0 | X | X | 3 | EI 120-U/C<br>E 120-U/C |

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 15,2 | 31,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-10 |
|---|---|

| Plastic pipes Geberit Silent-PP acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 3 | EI 90-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 125 | 4,2 | ≤ 4 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 5,2 | ≤ 4 | X | X | 8 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 4,2 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 5,2 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-11**

| Plastic pipes POLO-KAL NG acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| **Pipe dimensions (mm)** | | **Insulation thickness (mm)** | **Intumescent inlay** | | | **Fire resistance classification** |
| **Outer diameter** | **Wall thickness** | | **Pacifyre® IM 3** | **Pacifyre® IM 2** | **Nr. of layers** | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 3 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 125 | 3,9 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 4,9 | ≤ 4 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,4 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 3,9 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 4,9 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-12**

| Plastic pipes RAUPIANO PLUS acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| **Pipe dimensions (mm)** | | **Insulation thickness (mm)** | **Intumescent inlay** | | | **Fire resistance classification** |
| **Outer diameter** | **Wall thickness** | | **Pacifyre® IM 3** | **Pacifyre® IM 2** | **Nr. of layers** | |
| ≤ 50 | 1,8 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 1,9 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 2,7 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 125 | 3,1 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 3,6 | ≤ 4 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 1,8 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 1,9 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 2,7 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-13**

| Plastic pipes Triplus® acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 40 | 1,8 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,5 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 90 | 3,1 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 125 | 3,9 | ≤ 4 | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 4,9 | ≤ 4 | X | X | 8 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-14**

**Multiple penetration of maximum three plastic pipes acc. to cl. 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar Pacifyre® EFC (clearance between pipes maximum 15 mm; linear arrangement, no clusters), non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element**

| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
|---|---|---|---|---|---|---|
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 75 | 1,8 to 8,4 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

**PE-HD pipes acc. to cl. 2.1 of the ETA with a diameter ≤ 40 mm, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H**

| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
|---|---|---|---|---|---|---|
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 40 | 3,0 to 5,5 | --- | X | --- | 1 | EI 120-U/C<br>E 120-U/C |

**PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H**

| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
|---|---|---|---|---|---|---|
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 3,0 to 4,6 | --- | X | --- | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 2,7 to 10,0 | --- | X | --- | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 4,0 to 9,5 | --- | X | --- | 8 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX D-15**

| PP pipes acc. to cl. 2.1 of the ETA with a diameter ≤ 40 mm, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 40 | 1,8 to 5,5 | --- | X | --- | 1 | EI 120-U/C<br>E 120-U/C |

| PP pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 to 6,9 | --- | X | --- | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 2,7 to 10,0 | --- | X | --- | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 4,0 to 9,1 | --- | X | --- | 8 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
--- … invalid intumescent inlay
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-16 |
|---|---|

| PVC-U pipes acc. to cl. 2.1 of the ETA with a diameter ≤ 40 mm, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 40 | 1,8 to 3,0 | --- | X | --- | 1 | EI 120-U/C<br>E 120-U/C |

| PVC-U pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 5,6 | --- | X | --- | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 2,2 to 12,3 | --- | X | --- | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 160 | 3,2 to 11,8 | --- | X | --- | 8 | EI 120-U/C<br>E 120-U/C |

| PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – the minimum distance between two PE-HD pipes is 0 mm (measured from the surface of the pipe collar Pacifyre® EFC) – annular gap filled with Pacifyre® A, Pacifyre® S or Pacifyre® H | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 40 | 3,0 to 5,5 | --- | X | --- | 1 | EI 60-U/C<br>E 60-U/C |
| ≤ 50 | 3,0 to 4,6 | --- | X | --- | 2 | EI 60-U/C<br>E 60-U/C |
| ≤ 110 | 2,7 to 10,0 | --- | X | --- | 4 | EI 60-U/C<br>E 60-U/C |

--- … no insulation allowed
--- … invalid intumescent inlay
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-17 |
|---|---|

**Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides to the surface of the separating element – the annular gap between the metal pipes (including insulation) and the vertical separating element is 0 mm (no sealing of the annular gap is needed)**

| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
|---|---|---|---|---|---|---|
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| 28 | 1,2 to 14,2 | 12,5 to 42,5 | X | --- | 2 | EI 60 C/U<br>E 120 C/U |
| 28 | 1,2 to 14,2 | 42,5 | x | --- | 2 | EI 120 C/U<br>E 120 C/U |
| 28 to ≤ 54 | 1,2/1,5* to 14,2 | 42,5 | X | --- | 2 | EI 60 C/U<br>E 120 C/U |
| 54 to ≤ 108 | 1,5/2,5** to 14,2 | 42,5 | X | --- | 4 | EI 60 C/U<br>E 120 C/U |
| 108 | 2,5 to 14,2 | 42,5 | X | --- | 4 | EI 60-C/U<br>E 120-C/U |

* 1,2 mm for diameter 28 mm and 1,5 mm for diameter 54 mm;
The minimum pipe wall thickness for all other pipe diameters shall be determined by interpolation of the pipe wall thickness between the minimum and maximum pipe diameter.

** 1,5 mm for diameter 54 mm and 2,5 mm for diameter 108 mm;
The minimum pipe wall thickness for all other pipe diameters shall be determined by interpolation of the pipe wall thickness between the minimum and maximum pipe diameter.

**Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® IM 2 or Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band)**

| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
|---|---|---|---|---|---|---|
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 28 | 1,0 to 14,2 | 6,0 to 35,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |
| ≤ 54 | 1,5 to 14,2 | 9,0 to < 35,0 | X | X | 2 | EI 60-C/U<br>E 120-C/U |
| ≤ 54 | 1,5 to 14,2 | 35,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

| **Pacifyre® EFC System**<br>**- Fire resistance classification -** | **ANNEX D-18** |
|---|---|

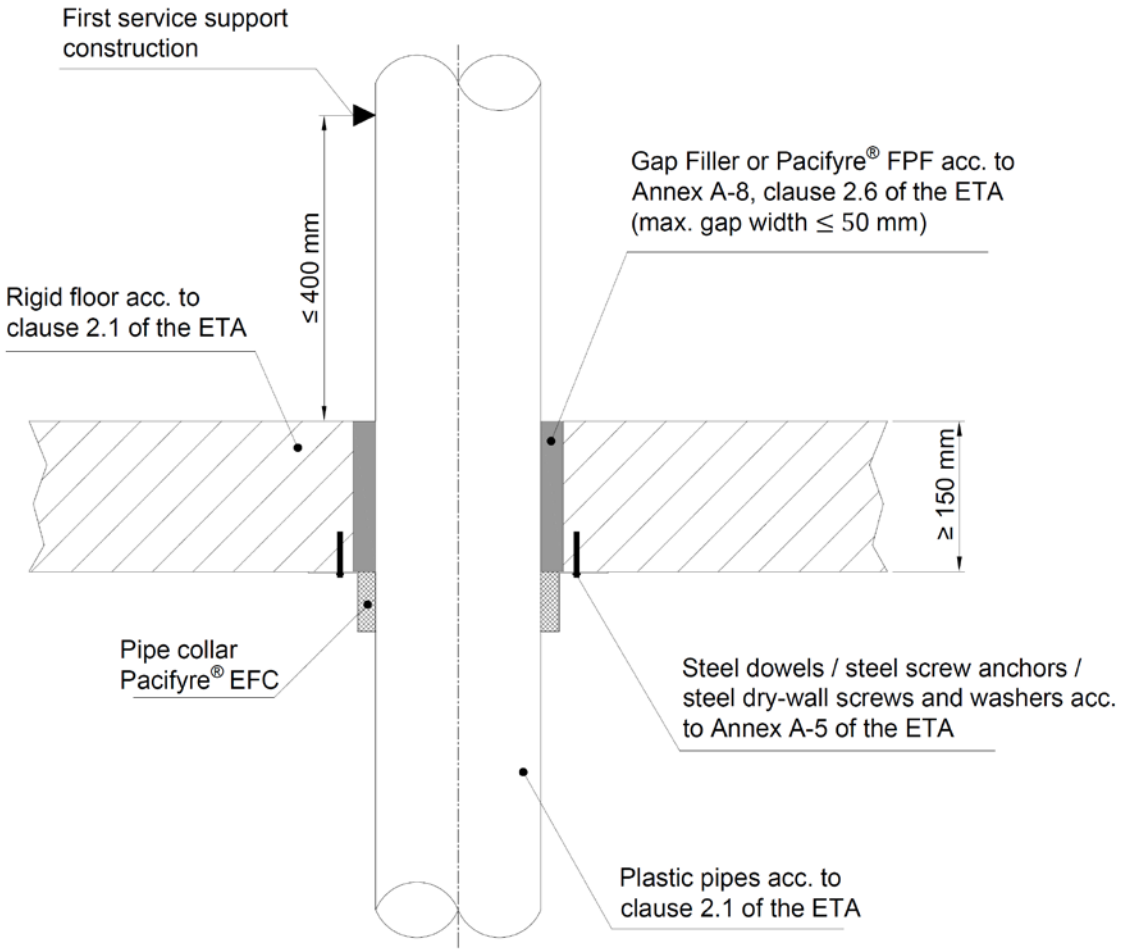
| Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on both sides flushed within the separating element (without Pacifyre® EFC Hook) – annular gap filled with Pacifyre® FPM | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| 108 | 2,5 to 14,2 | 12,5 to 42,5 | X | --- | 2 | EI 60-C/U<br>E 120-C/U |

| Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) and an additional layer of AF/Armaflex (length 300 mm, thickness ≥ 9,0 mm – on both sides of the separating element, local-interrupted LI) – in flexible walls and rigid walls acc. to cl. 2.1 of the ETA – Pacifyre® IM 2 or Pacifyre® IM 3 installed on both sides flushed within the separating element (without Pacifyre® EFC Band) | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 54 | 1,5 to 14,2 | 9,0 to < 35,0 | X | X | 2 | EI 90-C/U<br>E 120-C/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

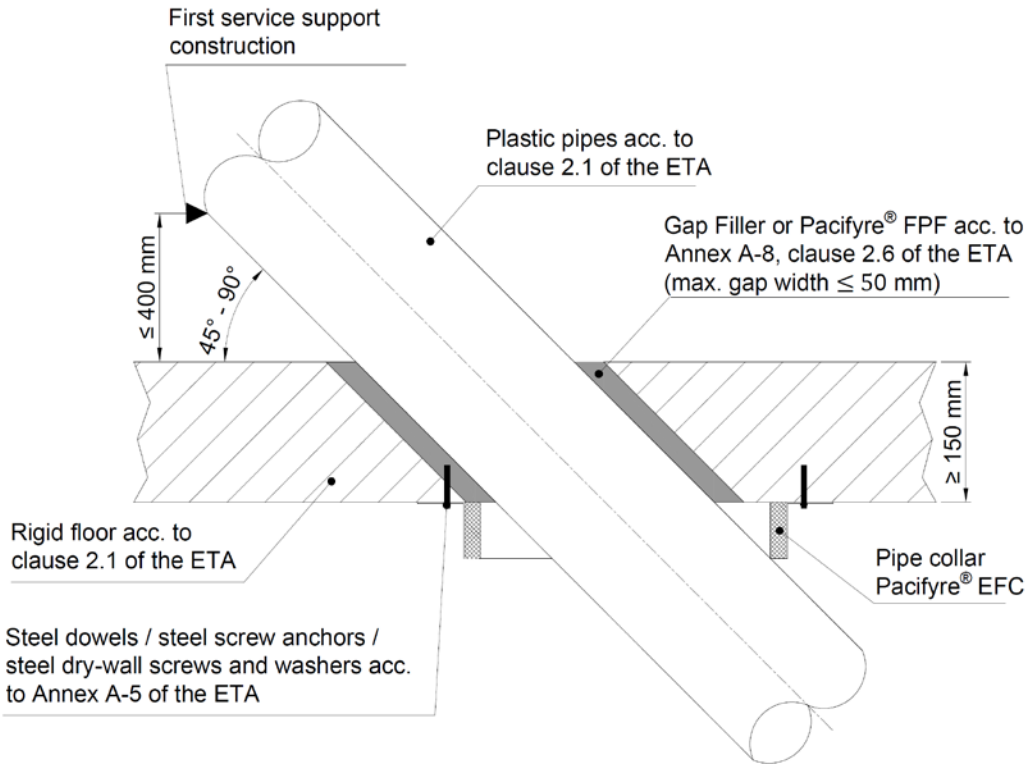
| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX D-19 |
|---|---|

**Plastic pipes according to clause 2.1 of the ETA, non-insulated – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



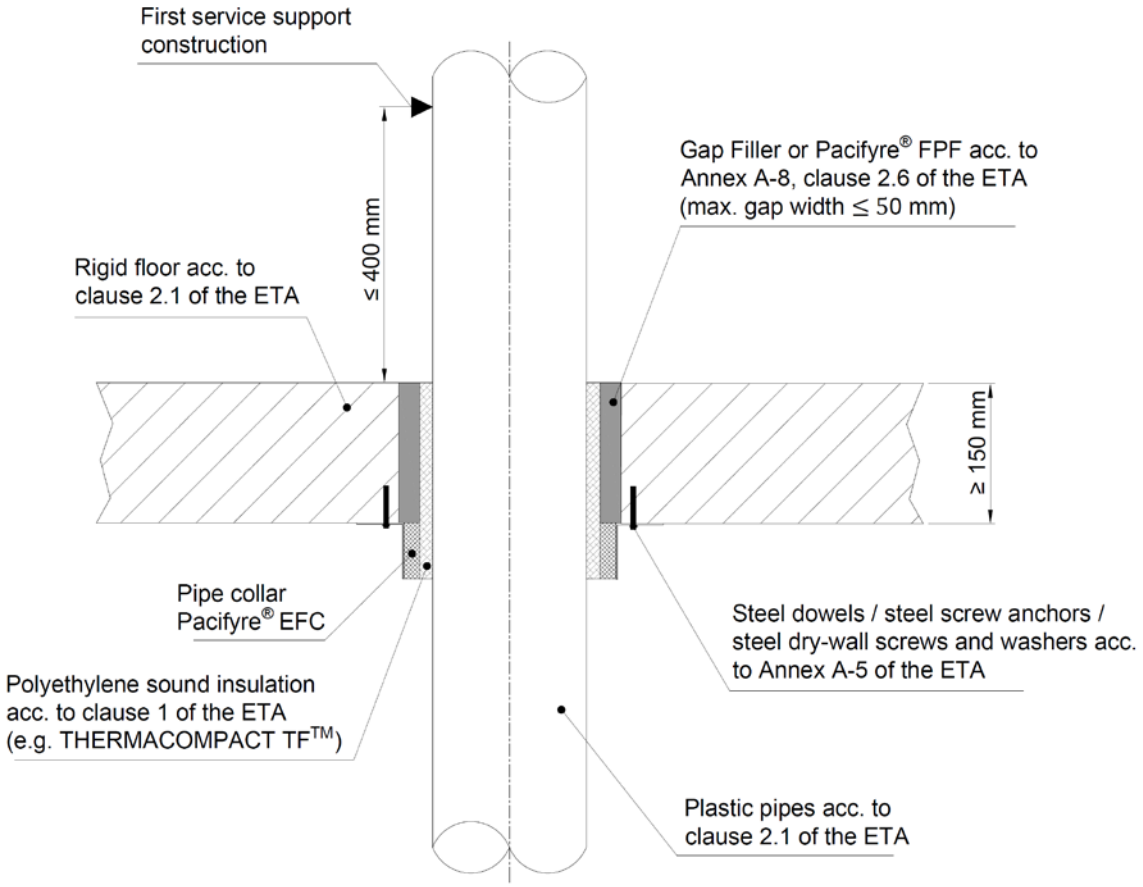

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-1** |

**Plastic pipes according to clause 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



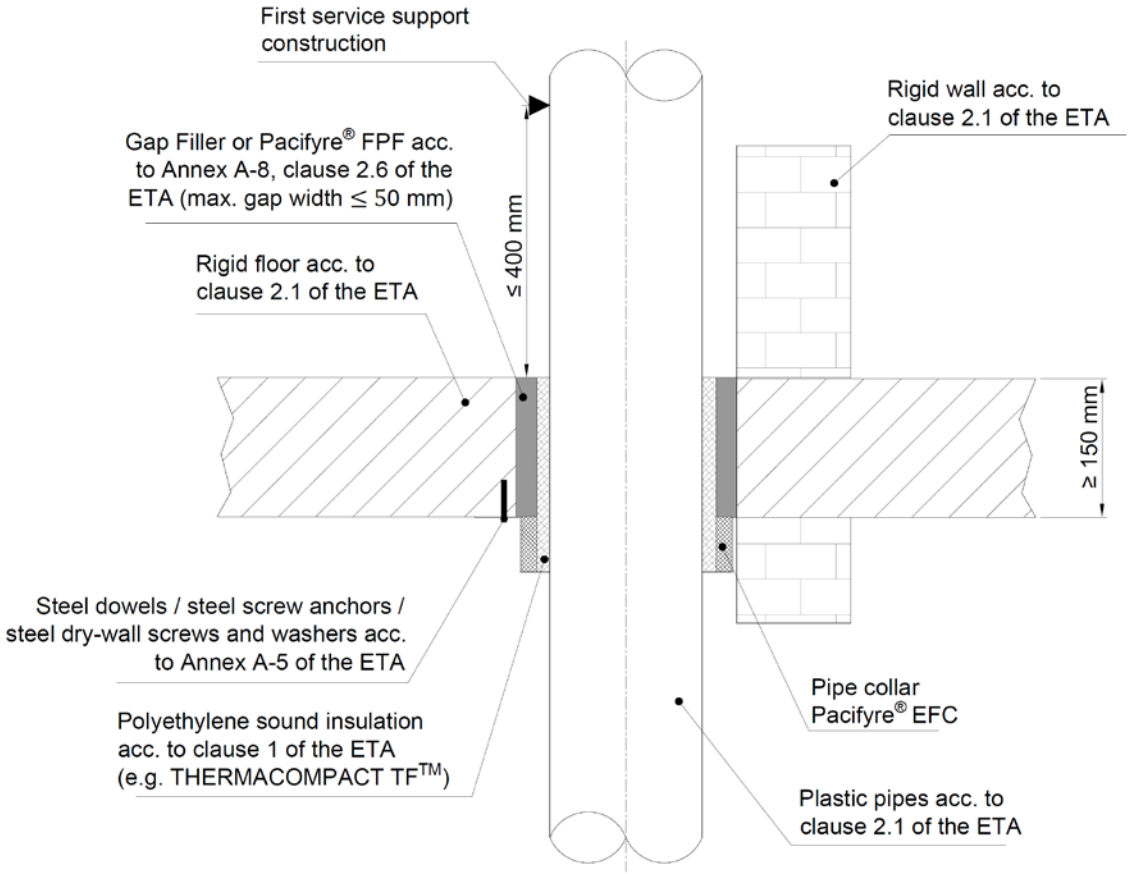

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-2** |

**Plastic pipes according to clause 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



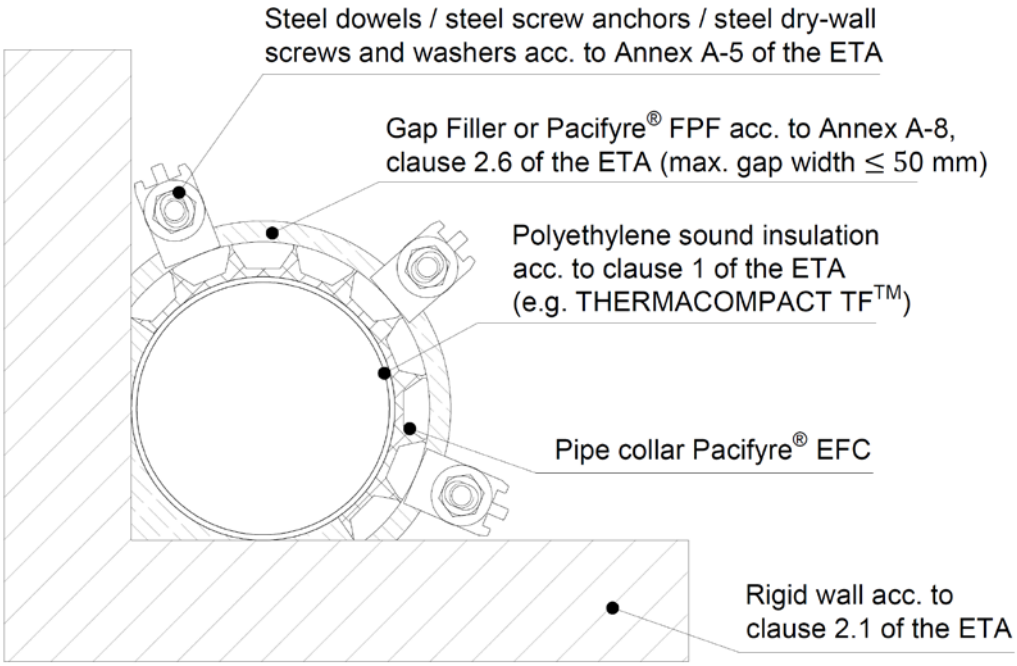

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-3** |

**Vertical plastic pipes according to clause 2.1 of the ETA which are positioned directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



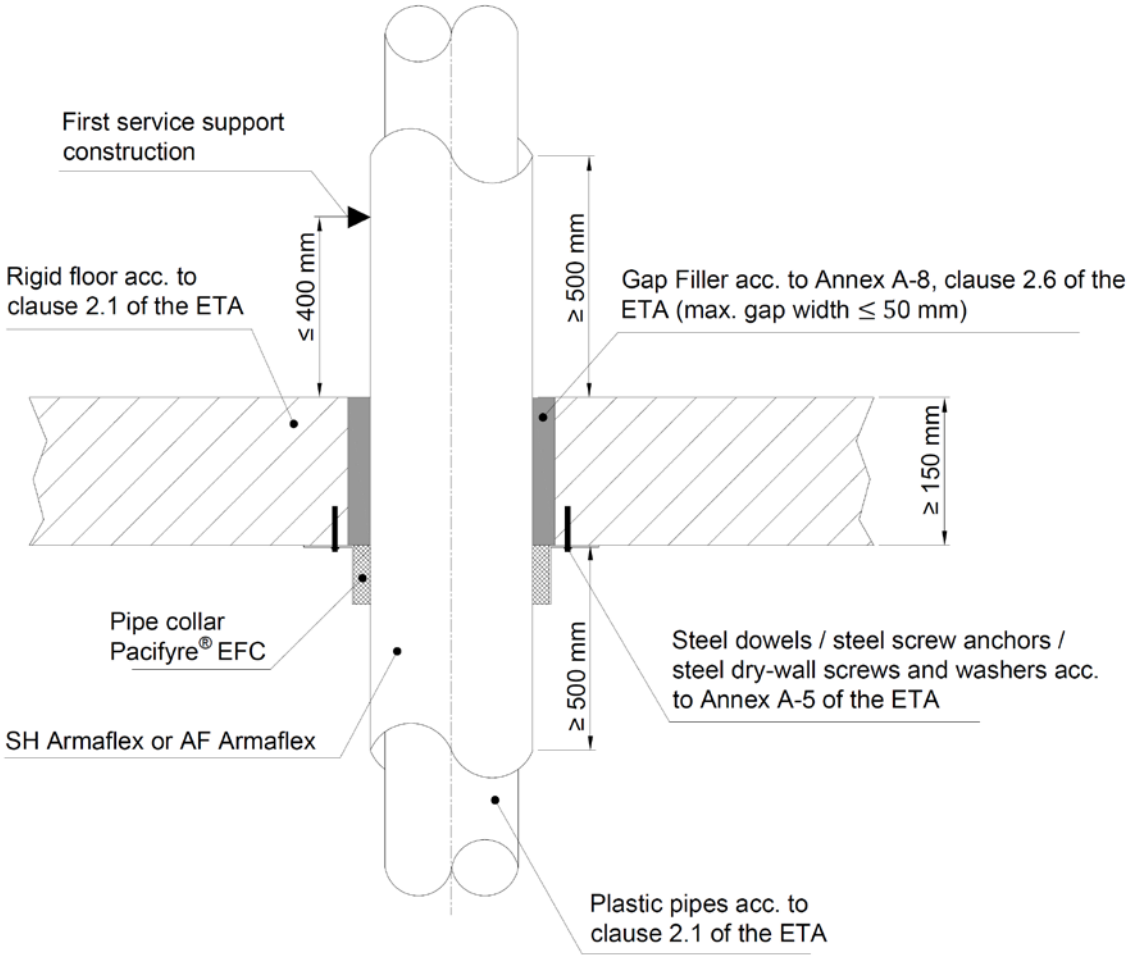

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-4** |

**Vertical plastic pipes according to clause 2.1 of the ETA which are positioned directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – top view**



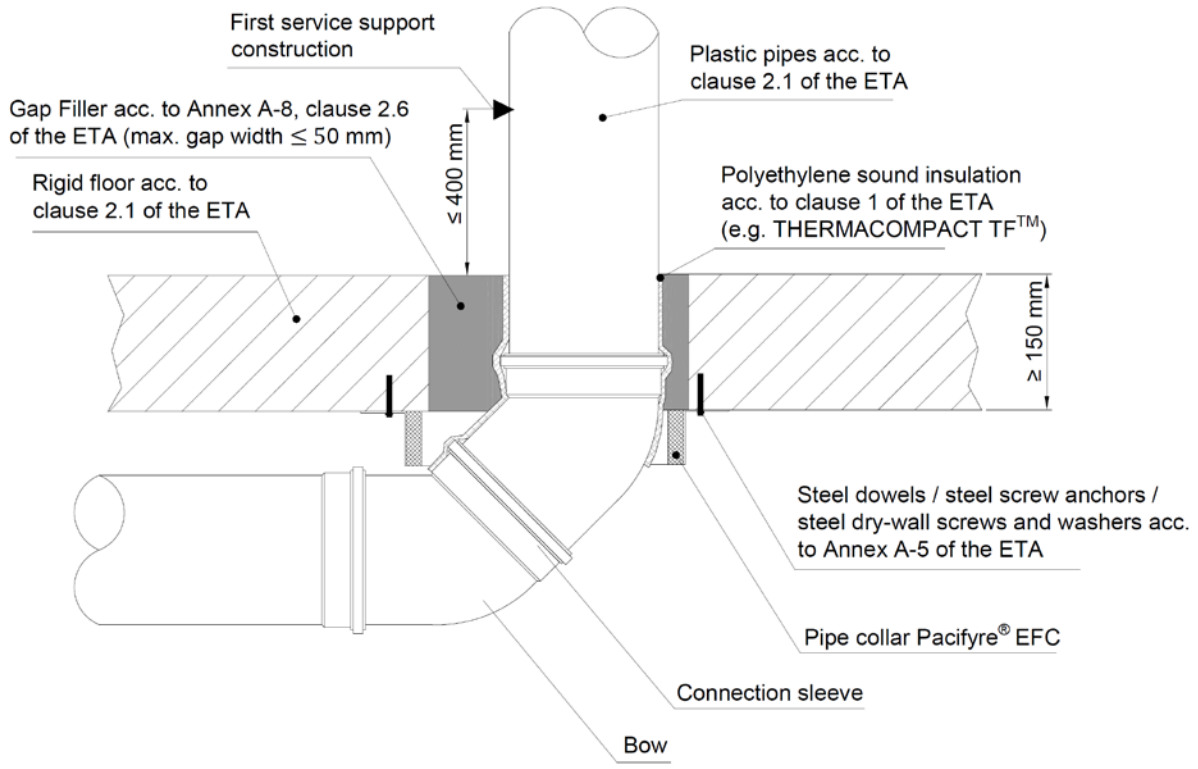

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-5** |

**Plastic pipes according to clause 2.1 of the ETA, insulated with SH/Armaflex or AF/Armaflex – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



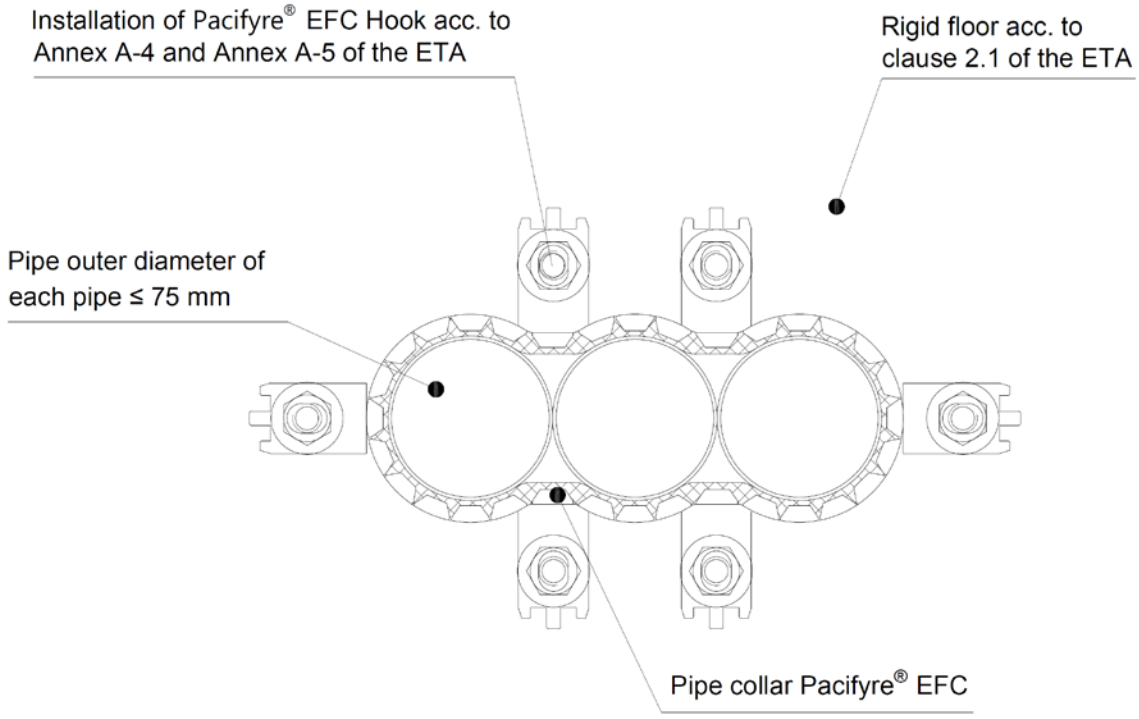

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-6** |

**Plastic pipes according to clause 2.1 of the ETA with bows on the bottom side of the floor and a connection sleeve within the floor, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF$^{TM}$) acc. to cl. 1 of the ETA – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**



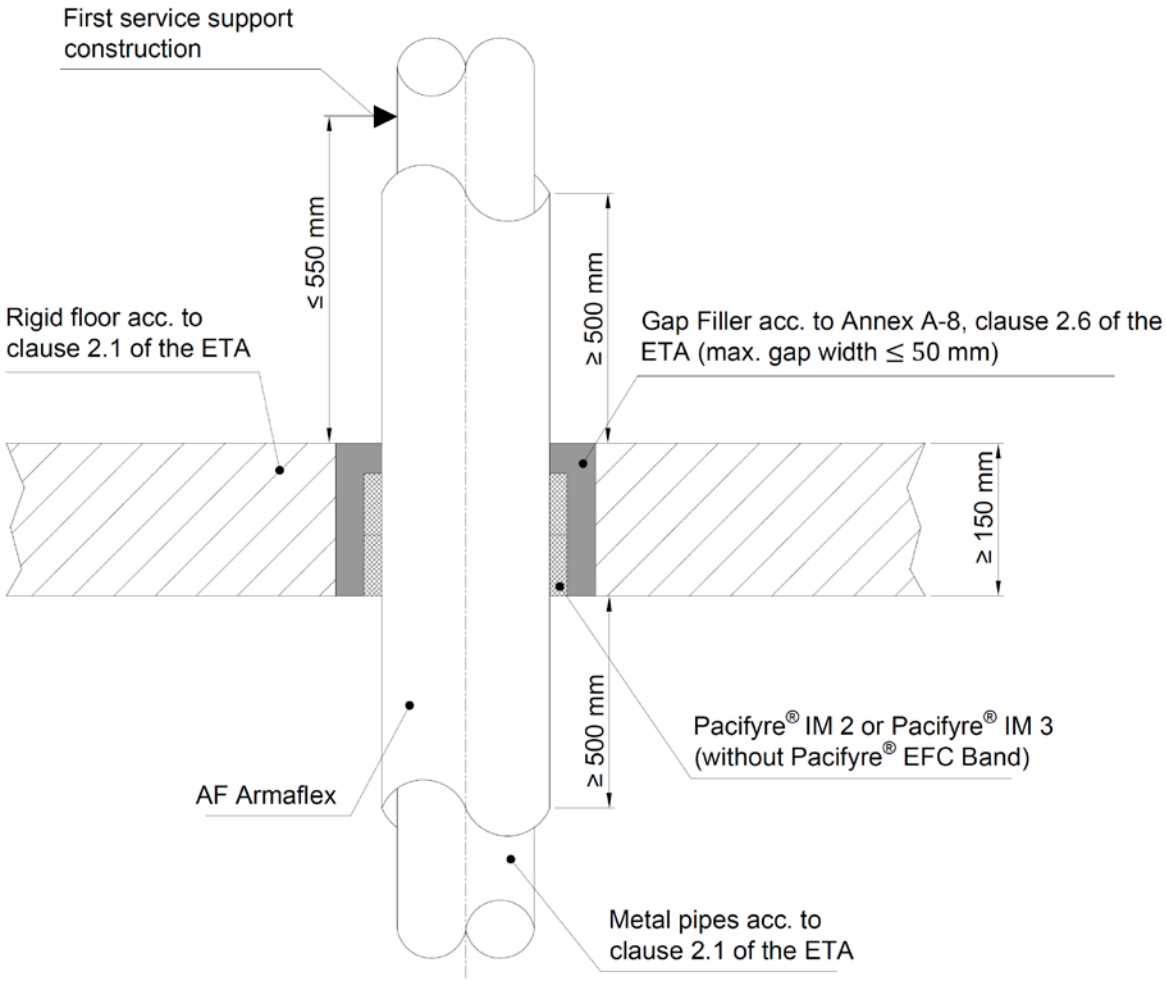

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-7** |

**Multiple penetration of maximum three plastic pipes acc. to cl. 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar Pacifyre® EFC (clearance between pipes maximum 15 mm; linear arrangement, no clusters), non-insulated – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – Installation drawing – top view**



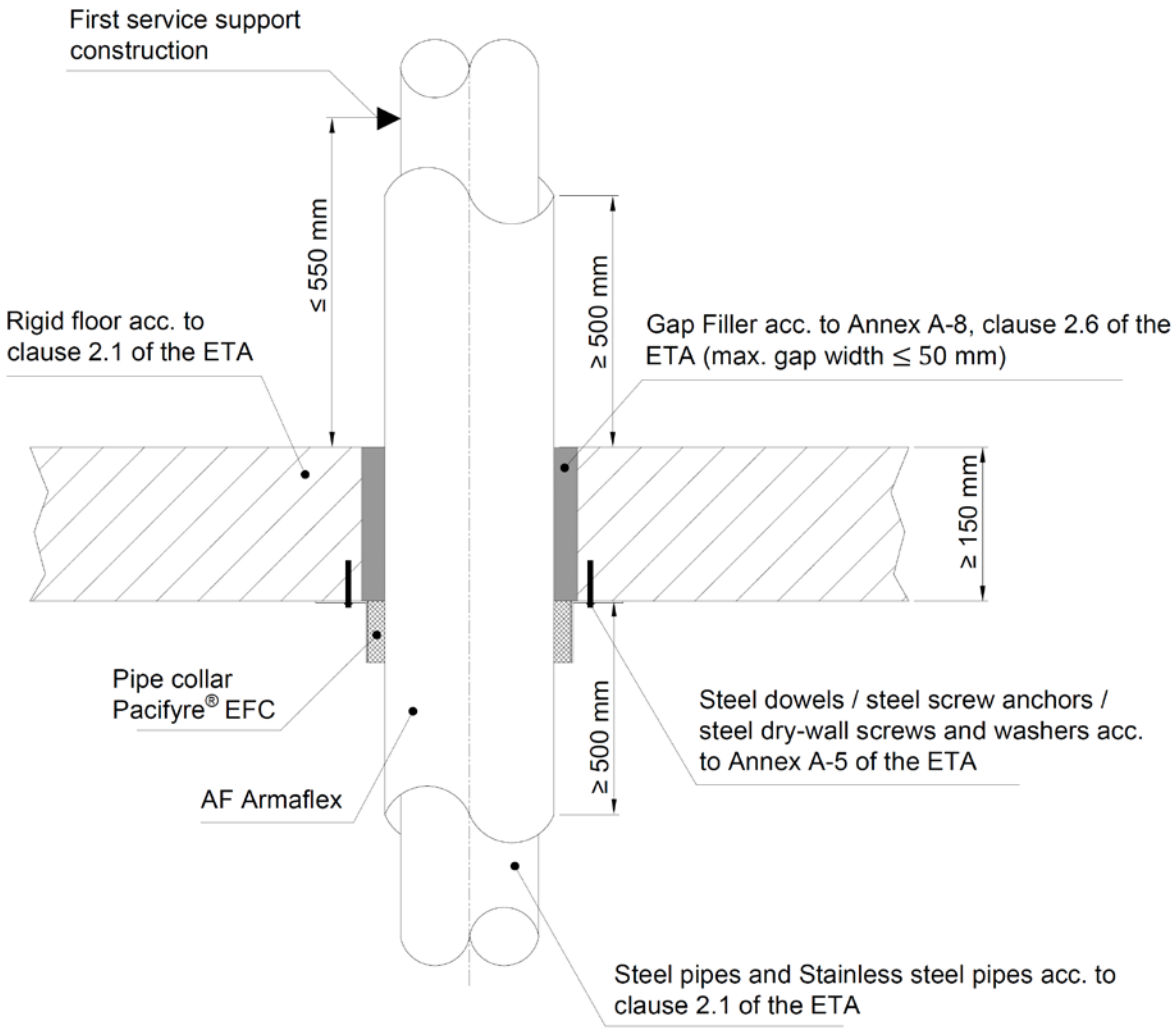

| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-8** |

**Metal pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex – in rigid floors according to clause 2.1 of the ETA – two Pacifyre® IM 2 or Pacifyre® IM 3 arranged one behind the other, installed on the bottom side flushed within the separating element (without Pacifyre® EFC Band) – Installation drawing – sectional view**




| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-9** |

**Steel pipes and stainless steel pipes according to clause 2.1 of the ETA, insulated with AF/Armaflex – in rigid floors according to clause 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element – Installation drawing – sectional view**




| | |
|---|---|
| **Pacifyre® EFC System**<br>**- Installation in rigid floor -** | **ANNEX E-10** |

| PVC-U pipes acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 5,6 | --- | X | X | 2 | EI 240-U/C<br>E 240-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 240-U/C<br>E 240-U/C |
| > 75 to ≤ 110 | 1,8 to 12,3 | --- | X | X | 4 | EI 240-U/C<br>E 240-U/C |
| > 110 to ≤ 125 | 2,2 to 12,1 | --- | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 3,2 to 11,9 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |

| PVC-U pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 12,3 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 125 | 12,1 | --- | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 11,9 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 3,2 | --- | X | X | 8 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-1 |
|---|---|

| PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 4,6 | --- | X | X | 2 | EI 240-U/C<br>E 240-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 240-U/C<br>E 240-U/C |
| > 75 to ≤ 110 | > 2,7 to 10,0 | --- | X | X | 4 | EI 180-U/C<br>E 240-U/C |
| > 110 to ≤ 160 | > 4,0 to 14,6 | --- | X | X | 6 | EI 120-U/C<br>E 240-U/C |

| PE-HD pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 4,6 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| > 50 to ≤ 110 | 2,7 to 10,0 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-2 |
|---|---|

| PE-HD pipes acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| >50 to ≤ 75 | 2,2 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| > 75 to ≤ 110 | 2,7 to 10,0 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |

| PE-HD pipes acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 10,0 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-3**

| PP pipes acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 to 4,6 | --- | X | X | 2 | EI 240-U/C<br>E 240-U/C |
| > 50 to ≤ 75 | 1,8 to 8,4 | --- | X | X | 3 | EI 240-U/C<br>E 240-U/C |
| > 75 to ≤ 110 | > 2,7 to 10,0 | --- | X | X | 4 | EI 180-U/C<br>E 180-U/C |
| > 110 to ≤ 125 | > 3,1 to 11,4 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | > 4,0 to 14,6 | --- | X | X | 8 | EI 120-U/C<br>E 120-U/C |

| PP pipes acc. to cl. 2.1 of the ETA, non-insulated, installed in an angle between 90° and 45° – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 2,7 to 10,0 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| > 110 to ≤ 125 | 3,2 to 12,0 | --- | X | X | 6 | EI 120-U/C<br>E 120-U/C |
| > 125 to ≤ 160 | 4,0 to 14,6 | --- | X | X | 8 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| PP pipes acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 2,7 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-4 |
|---|---|

| Plastic pipes alpex F50 PROFI and alpex L acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 4,0 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes alpex F50 PROFI and alpex L acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,0 | 9,0 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | 9,0 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | > 9,0 to 20,0 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 5,0 | > 20,0 to 30,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

| Plastic pipes alpex F50 PROFI and alpex L acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 75 | 5,0 | 9,5 | X | X | 4 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-5**

| Plastic pipes BluePower® acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,5 | ≤ 4 | X | X | 4 | EI 90-U/C<br>E 90-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 5 | EI 90-U/C<br>E 90-U/C |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-6**

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 4,5 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 7,5 | --- | X | X | 3 | EI 90-U/C<br>E 90-U/C |
| ≤ 110 | 10,0 | --- | X | X | 4 | EI 90-U/C<br>E 90-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 4,5 | 10,0 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 63 | 6,0 | 9,0 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 90 | 8,5 | 9,0 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | > 9,0 to 20,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

| Plastic pipes Uponor Unipipe Mehrschichtverbundrohr MLC acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 4,5 | 27,5 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 7,5 | 30,0 | X | X | 5 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 10,0 | 9,5 to 31,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-7 |
|---|---|

| Plastic pipes Wavin SiTech+ acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 125 | 4,2 | ≤ 4 | X | X | 5 | EI 60-U/C<br>E 60-U/C |
| ≤ 160 | 5,3 | ≤ 4 | X | X | 6 | EI 60-U/C<br>E 60-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 4,2 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 5,3 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-8**

| Plastic pipes Wavin SiTech+ acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

| Plastic pipes Wavin SiTech+ acc. to cl. 2.1 of the ETA, with bows on the bottom side of the floor and a connection sleeve within the floor, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-9 |
|---|---|

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 16 | 2,2 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 7,9 | --- | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 11,8 | --- | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 17,2 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, insulated with SH/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 6,9 | 10,0 | X | X | 3 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| Pacifyre® EFC System<br>- Fire resistance classification - | ANNEX F-10 |
|---|---|

| Plastic pipes Fusiotherm® Stabiverbundrohr acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 15,2 | 31,0 | X | X | 6 | EI 120-U/C<br>E 120-U/C |

X … valid intumescent inlay

| Plastic pipes Fusiotherm® SDR 11 acc. to cl. 2.1 of the ETA, non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 315 | 28,6 | --- | X | X | 20 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-11**

| Plastic pipes Geberit Silent-PP acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 120-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 3 | EI 120-U/C<br>E 120-U/C |
| ≤ 110 | 3,6 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 4,2 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 5,2 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-12**

| Plastic pipes Geberit Silent-PP acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

| Plastic pipes Geberit Silent-PP acc. to cl. 2.1 of the ETA, with bows on the bottom side of the floor and a connection sleeve within the floor, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,6 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-13**

| Plastic pipes POLO-KAL NG acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | X | X | 2 | EI 90-U/C<br>E 120-U/C |
| ≤ 75 | 2,6 | ≤ 4 | X | X | 3 | EI 90-U/C<br>E 120-U/C |
| ≤ 110 | 3,4 | ≤ 4 | X | X | 4 | EI 120-U/C<br>E 120-U/C |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,4 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 3,9 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 4,9 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-14**

| Plastic pipes POLO-KAL NG acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 3,4 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

| Plastic pipes POLO-KAL NG acc. to cl. 2.1 of the ETA, with bows on the bottom side of the floor and a connection sleeve within the floor, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 3,4 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-15**

| Plastic pipes RAUPIANO PLUS acc. to cl. 2.1 of the ETA, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 1,8 | ≤ 4 | --- | X | 2 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 1,9 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 2,7 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 125 | 3,1 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |
| ≤ 160 | 3,6 | ≤ 4 | --- | X | 6 | EI 120-U/U<br>E 120-U/U |

| Plastic pipes RAUPIANO PLUS acc. to cl. 2.1 of the ETA, positioned vertically directly in the corner of the wall (clearance between pipe and wall maximum 10 mm), insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 110 | 2,7 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

| Plastic pipes RAUPIANO PLUS acc. to cl. 2.1 of the ETA, with bows on the bottom side of the floor and a connection sleeve within the floor, insulated with Polyethylene sound insulation (e.g. THERMACOMPACT TF™) acc. to cl. 1 of the ETA – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 50 | 2,0 | ≤ 4 | --- | X | 3 | EI 120-U/U<br>E 120-U/U |
| ≤ 75 | 2,6 | ≤ 4 | --- | X | 4 | EI 120-U/U<br>E 120-U/U |
| ≤ 110 | 2,7 | ≤ 4 | --- | X | 5 | EI 120-U/U<br>E 120-U/U |

--- … invalid intumescent inlay
X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-16**

| Multiple penetration of maximum three plastic pipes acc. to cl. 2.1 of the ETA made from PVC-U, PE-HD or PP through one concerted pipe collar Pacifyre® EFC (clearance between pipes maximum 15 mm; linear arrangement, no clusters), non-insulated – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter of each pipe | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 75 | 1,8 to 8,4 | --- | X | X | 4 | EI 120-U/C<br>E 120-U/C |

--- … no insulation allowed
X … valid intumescent inlay

| Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – two Pacifyre® IM 2 or Pacifyre® IM 3 arranged one behind the other, installed on the bottom side flushed within the separating element (without Pacifyre® EFC Band) | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 28 | 1,0 to 14,2 | 6,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |
| ≤ 28 | 1,0 to 14,2 | 6,0 to < 20,0 | X | X | 3 | EI 120-C/U<br>E 120-C/U |
| ≤ 28 | 1,0 to 14,2 | > 20,0 to 35,0 | X | X | 4 | EI 120-C/U<br>E 120-C/U |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-17**

| Metal pipes (copper pipes, steel pipes, stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – two Pacifyre® IM 2 or Pacifyre® IM 3 arranged one behind the other, installed on the bottom side flushed within the separating element (without Pacifyre® EFC Band) | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 54 | 1,5 to 14,2 | 9,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |
| ≤ 54 | 1,5 to 14,2 | > 9,0 to 22,0 | X | X | 3 | EI 120-C/U<br>E 120-C/U |
| ≤ 54 | 1,5 to 14,2 | > 22,0 to 35,0 | X | X | 4 | EI 120-C/U<br>E 120-C/U |
| ≤ 89 | 2,0 to 14,2 | 13,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |
| ≤ 108 | 2,5 to 14,2 | 13,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |

| Metal pipes (only steel pipes and stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – two Pacifyre® IM 2 or Pacifyre® IM 3 arranged one behind the other, installed on the bottom side flushed within the separating element (without Pacifyre® EFC Band) | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 108 | 2,0 to 14,2 | 13,0 to 30,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |

| Metal pipes (only steel pipes and stainless steel pipes) acc. to cl. 2.1 of the ETA, insulated with AF/Armaflex (length ≥ 500 mm – on both sides of the separating element, local-sustained LS or continued-sustained CS) – in rigid floors acc. to cl. 2.1 of the ETA – Pacifyre® EFC installed on the bottom side to the surface of the separating element | | | | | | |
|---|---|---|---|---|---|---|
| Pipe dimensions (mm) | | Insulation thickness (mm) | Intumescent inlay | | | Fire resistance classification |
| Outer diameter | Wall thickness | | Pacifyre® IM 3 | Pacifyre® IM 2 | Nr. of layers | |
| ≤ 108 | 2,0 to 14,2 | 13,0 to 30,0 | X | X | 2 | EI 120-C/U<br>E 120-C/U |

X … valid intumescent inlay

**Pacifyre® EFC System**

**- Fire resistance classification -**

**ANNEX F-18**