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Authorised and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA



European Technical Assessment ETA-20/0732 of 2020/10/09

General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the
construction product:

Pacifyre® MKII Firesleeve

Product family to which the
above construction product
belongs:

Fire Stopping and Sealing Product -
Fire protective collar

Manufacturer:

J. van Walraven Holding B.V.
Industrieweg 5
NL-3641 RK Mijdrecht
Tel. + 31 297 23 30 00
Internet www.walraven.com

Manufacturing plant:

Walraven Factory W4

This European Technical
Assessment contains:

21 pages including 5 annexes which form an integral
part of the document

This European Technical
Assessment is issued in
accordance with Regulation
(EU) No 305/2011, on the
basis of:

EAD 350454-00-1104: "Fire
Stopping and Fire Sealing Products, Penetration Seals",
version September 2017

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

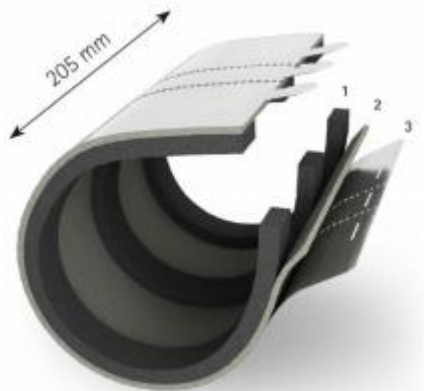
1 Technical description of product and intended use

Technical description of the product

Pacifyre® MKII Firesleeve is a fire stopping and fire sealing penetration seal in the form of a stainless-steel sleeve.

The Pacifyre® MKII Firesleeve fire resistant pipe closure device is affixed around burnable pipes according to Annex 4 preventing propagation of fire. The Pacifyre® MKII starts expanding at temperatures above 180° C and can be applied in environments up to 140° C. When the intumescent starts expanding into the pipe, it delays the heat and flames from passing through the fire barrier. Keeping the barrier intact and preventing the rapid spread of fire.

The Pacifyre® MKII Firesleeve has 3 foam strips that help stop cold- and hot smoke from passing, create a snug fit around the pipe and absorb 21 dB of contact noise between burnable pipes and the substrate.



1. Three foam strips
2. A layer of intumescent (thickness e)
3. A sleeve of stainless steel

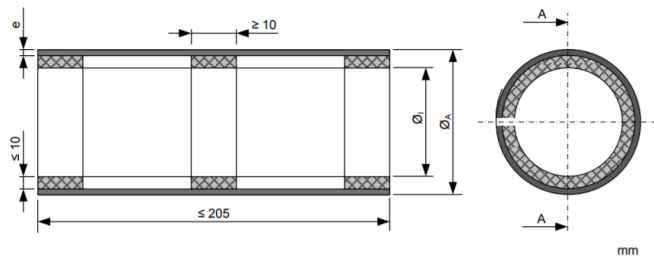


Figure 1 : Pacifyre® MKII Firesleeve

The Pacifyre® MKII Firesleeve is composed of a stainless-steel casing of 205 mm width and reactive inlay of 1 mm to 8 mm thickness depending on the diameter of the collar (see Figure 1 and Table 1).

Pacifyre® MKII Firesleeve is available for pipes with a diameter between 16mm and 200 mm as shown in Table 1.

DN	Code	Ø _A [mm]	Ø _I [mm]	e [mm]
16	215 1 015017	40	15-17	1
20	215 1 018020	45	18-20	1
25	215 4 024026	50	23-28	4
32	215 4 030032	55	29-36	4
40	215 4 038041	65	38-44	4
50	215 4 048050	75	46-52	4
52	215 4 051053	75	48-55	4
56	215 4 054056	80	52-58	4
58	215 4 057059	85	55-61	4
63	215 4 063065	90	61-67	4
75	215 4 075077	100	70-79	4
80	215 4 078080	105	78-80	4
90	215 4 090092	115	86-94	4
100	215 4 099101	125	95-103	4
110	215 4 108110	135	104-113	4
120	215 8 123125	160	120-128	8
135	215 8 135137	170	131-139	8
140	215 8 138140	175	136-144	8
160	215 8 159 161	195	155-164	8
180	215 8 180182	215	175-184	8
200	215 2 198200	245	195-204	12

Table 1 : Dimensions of Pacifyre® MKII Firesleeve

Detailed specifications for identification and performance criteria relevant for fire safety with regard to the construction products are given in Annexes 2.2, 3.2 & 4.2.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The construction product Pacifyre® MKII Firesleeve is a penetration seal for services penetrating walls and floors, it is designed for mounting in fire rated walls and floors around burnable pipes to seal pipe penetrations against the spread of smoke and fire

The through-elements are installed in drilled holes or in reservations made through concrete or masonry floors, ≥150 mm thick with a density equal or greater than 550 kg/m³, through rigid wall constructions made of masonry or concrete, ≥150 mm thick, with a density equal or greater than 550 kg/m³ or through ≥100 mm thick flexible wall constructions.

The detailed descriptions of these construction elements are given in Annex 1 of this ETA. This ETA covers assemblies installed in accordance with the provisions given in Annexes 1-5. Other intended uses may be supported by other means at national level but are not covered by this ETA.

The area to be sealed requires the same fire resistance as the complete wall or floor construction. In order to ensure that the stability of the services is maintained under fire conditions, all services should be adequately supported at maximum 500 mm and from the non-exposed surface of the floor or at 500 mm to either side of the supporting structures for walls. More instructions for the installation of Pacifyre® MKII Firesleeve can be found the technical instructions of the manufacturer.

Pacifyre® MKII Firesleeve collar is suitable for the following built in conditions:

- Pacifyre® MKII Firesleeve shall be installed in the wall or in a floor.
- Pacifyre® MKII Firesleeve is suitable for pipes according to Annex 4.
- The Pacifyre® MKII Firesleeve should be fixed in a wall or floor with an appropriate fire resistance.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of at least 25 years for the Pacifyre® MKII Firesleeve, provided that the fire stopping pipe closure device is subject to appropriate use and maintenance, in accordance with the manufacturer's recommendations.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

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

Characteristic	Assessment of characteristic
3.2 Safety in case of fire (BWR 2)	
Reaction to fire	<p>The collar housing of Pacifyre® MKII Firesleeve made of stainless-steel, classified as Euroclass A1 in accordance with EN 13501-1.</p> <p>The intumescent material of Pacifyre® MKII Firesleeve is classified as Euroclass F in accordance with EN 13501-1</p>
Resistance to fire	<p>The Pacifyre® MKII for pipe penetrations is permitted in lightweight partition walls and solid walls with a thickness of at least 100 mm and in solid ceilings with a thickness of at least 150 mm. The system is classified as described in the Annexes 2.2, 3.2 and 4.2 in accordance with EN 13501-2</p>
3.3 Hygiene, health, and the environment (BWR 3)	
Air permeability	No Performance Assessed
Water permeability	No Performance Assessed
Content, emission and/or release of dangerous substances	<p>The manufacturer of the intumescent material Pacifyre® MKII Firesleeve states that the product does not contain dangerous substances detailed in Council Directive 67/548/EEC and Regulation (EC) no 1272/2008 above the acceptable limits.</p> <p>In addition to the specific clauses relating to dangerous substances contained in this European technical assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Product Directive, these requirements need also to be complied with, when and where they apply.</p>
3.4 Safety and accessibility in use (BWR 4)	
Mechanical resistance and stability	No Performance Assessed
Resistance to impact/movement	No Performance Assessed
Adhesion	No Performance Assessed
Durability	No Performance Assessed
3.5 Protection against noise (BWR 5)	
Airborne sound insulation	No Performance Assessed

Characteristic	Assessment of characteristic
3.6 Energy Economy and heat retention (BWR 6)	
Thermal properties	No Performance Assessed
Water vapour permeability	No Performance Assessed

*) See additional information in section 3.9

3.9 General aspects

Durability and serviceability:

The verification of durability and serviceability is part of testing the essential characteristics. Pacifyre® MKII Firesleeve fulfils the requirements according to EAD 350454-00-1104 clause 1.2.1 – for use **Category type: Z₁**.

Although a firesleeve 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 is closed. For this case provisions shall be made to protect temporarily exposed firesleeves according to the ETA-holder's installation instructions.

The proof and its assessment concerning applicability under climate conditions were carried out in accordance with EAD 350454-00-1104; internal conditions with humidity $\geq 85\%$ RH excluding temperature below 0°C, without exposure to rain and UV.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 1999/454/EC of the European Commission, as amended by 2001/596/EC, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 1.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2020-10-09 by



Thomas Bruun
Managing Director, ETA-Danmark

1.1 Technical description of the products

Pacifyre® MK II system” is a product to be used as pipe penetration seal based on the pipe sleeve “Pacifyre® MK II” in combination with gap fillers and insulations (additional components).

Components of the pipe sleeve “Pacifyre® MK II”	Characteristics
Pacifyre® IM 7	Flexible intumescent sheet with a nominal thickness of 4 mm and a width of 205 mm
Pacifyre® MK II metal	Metal sheet made of stainless steel (according to EN 10088-2) with a width of 205 mm and a thickness of 0,25 mm for housing the “Pacifyre® IM 7” intumescent.
Pacifyre® Foam strips	Three non-burnable polyurethane foam strips 25mm wide and 10 mm high positioned in the middle and edges of the Pacifyre® MK II on top of the intumescent.

Gap fillers (additional components)	Characteristics
Pacifyre® A	One component fire retardant sealant based on a water based acrylic dispersion with plasto-elastic properties. See ETA 16-1008 for further details and standalone applications
Pacifyre® S	Neutral one component fire retardant sealant based on silicone. See ETA 16-1007 for further details and standalone applications
Pacifyre® H	One component fire retardant sealant based on a silyl modified polymer (MS-Polymer). See ETA 16-1009 for further details and standalone applications
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. For example, Pacifyre® FPM
Mineral wool boards	Non-combustible mineral wool material with classification A1 or A2-s1,d0 according to EN 13501-1 with a minimal density of 140 kg/m ³ , a thickness ≥ 50 mm and a melting point ≥ 1000 °C according to DIN 4102-17. For example: Pacifyre® MP Board in combination with Pacifyre® A to seal the cutting joints and edges of the boards.

Pacifyre® MK II system	Annex 1 General
1.1 Technical description of the products	

1.2 Specification of the intended use(s)

“Pacifyre® MK II” 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 pipes.

“Pacifyre® MK II” can be installed in the types of separating elements as specified in the following table.

Separating element	Construction
Flexible walls	<ul style="list-style-type: none"> • 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 • For timber stud walls 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 • Minimum total wall thickness 100 mm • Classification according to EN 13501-2: \geq EI 90 • This European Technical Assessment does not cover sandwich panel constructions and flexible walls where the lining does not cover studs on both sides. Penetrations in such constructions shall be tested on a case by case basis
Rigid walls	<ul style="list-style-type: none"> • Aerated concrete, concrete, masonry • Minimum thickness 100 mm • The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period
Rigid floors	<ul style="list-style-type: none"> • Aerated concrete, concrete • Minimum density 550 kg/m³ • Minimum thickness 150 mm • The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period

Pacifyre® MK II system	Annex 1 General
1.2 Specification of the intended use(s)	

1.3 General assumptions

It is assumed that:

- damages to the penetration seal are repaired accordingly,
- the installation of the penetration seal does not affect 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 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.

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.

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.

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).

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

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.

Pacifyre® MK II system	Annex 1 General
1.3 General assumptions	

1.4 Pipe end configuration

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

All pipes in this ETA have been classified as U/C unless otherwise mentioned.

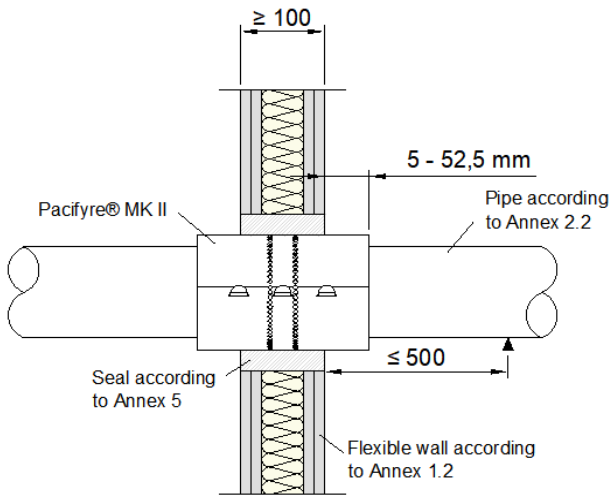
1.5 Service support constructions

All pipes– in flexible/rigid walls and rigid floors – 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.

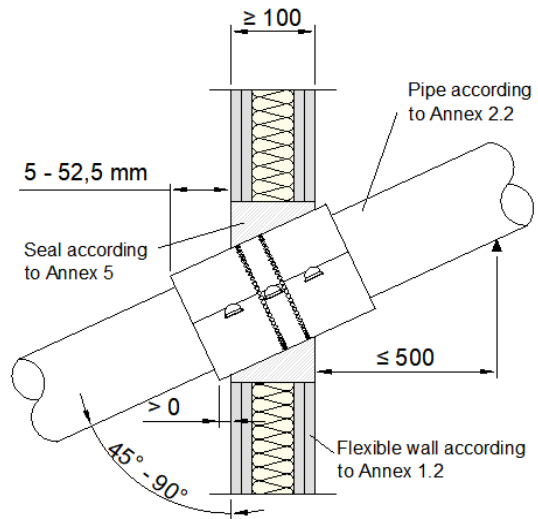
The first support (service support construction) has to be at maximum 500 mm (measured from the surface of the separating element).

Pacifyre® MK II system	Annex 1 General
1.4 Pipe end configuration & 1.5 Service support constructions	

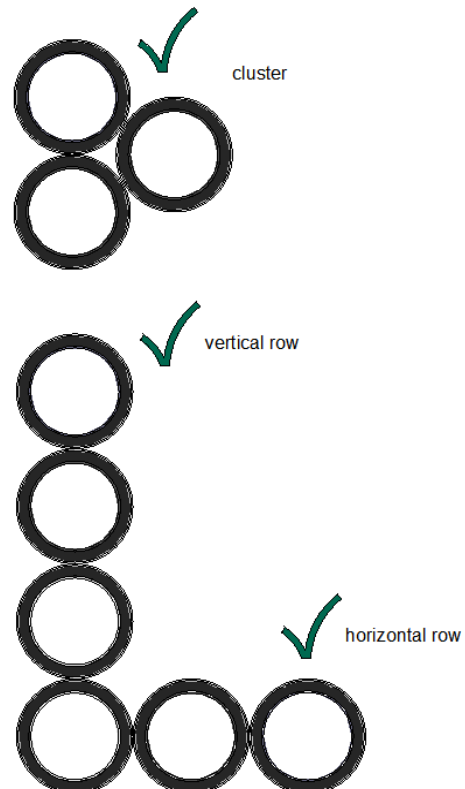
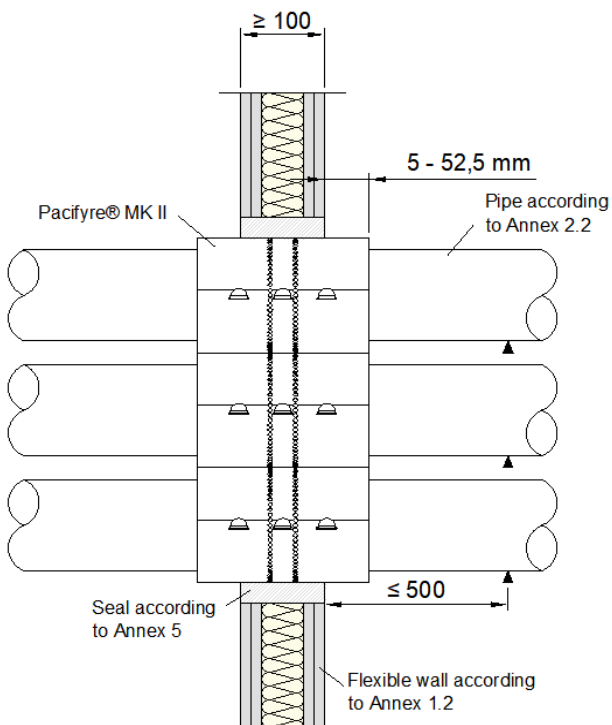
Perpendicular to the surface:



Angled to the surface:



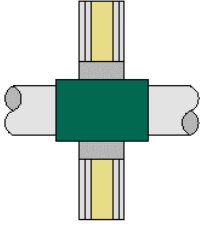
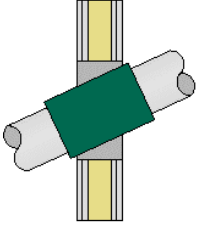
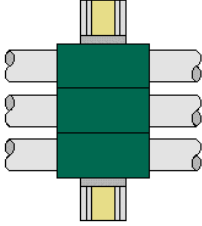
Perpendicular to the surface with a "zero-distance" in between the collars:

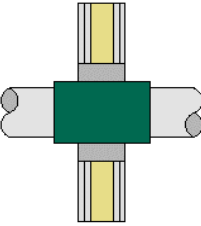
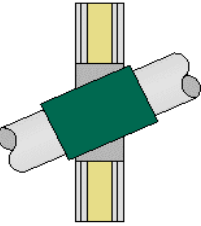
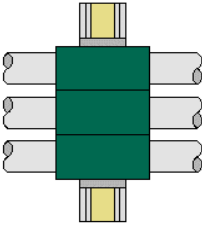


Pacifyre® MK II system

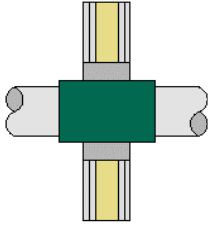
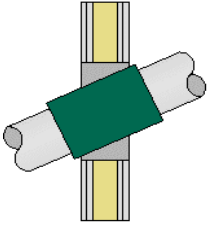
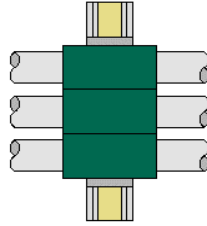
2.1 Installation guideline

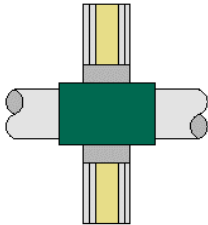
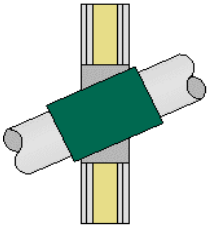
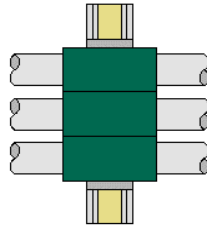
Annex 2
Flexible wall

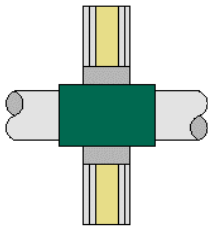
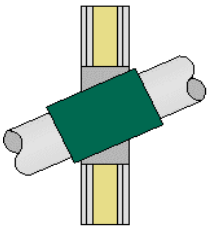
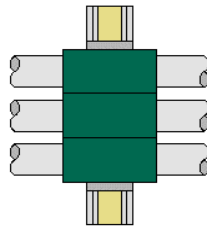
<p>PE Polyethylene Pipes (PE-HD, PE-LD, PE 100)</p>							
		E	I	E	I	E	I
Outer-Ø	Thickness	[min]	[min]	[min]	[min]	[min]	[min]
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 3,0	120	120	90	90	120	120
≤ 50	1,8 - 4,6	120	120	90	90	120	120
≤ 75	2,7 - 6,8	120	120	90	90	120	120
≤ 110	2,7 - 15,1	60	60	90	90	120	120
	2,7 - 10,0	90	90	90	90	120	120
	4,2 - 10,0	120	120	90	90	120	120
≤ 160	3,1 - 4,4	90	90	-	-	-	-
	4,5 - 14,6	60	60	-	-	-	-
≤ 180	3,1 - 4,4	90	90	-	-	-	-
	4,5 - 24,6	60	60	-	-	-	-

<p>PP Polypropylene Pipes (PP, PP-H, PP-R)</p>							
		E	I	E	I	E	I
Outer-Ø	Thickness	[min]	[min]	[min]	[min]	[min]	[min]
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 2,8	90	90	-	-	120	120
≤ 50	1,8 - 4,6	90	90	-	-	120	120
≤ 75	1,9 - 6,8	90	90	-	-	120	120
≤ 110	2,7 - 10,0	90	90	-	-	120	120
110	10	120	120	-	-	120	120
≤ 160	3,1 - 4,0	90	60	-	-	-	-
	4,1 - 14,6	60	60	-	-	-	-
≤ 180	3,1 - 4,4	90	60	-	-	-	-
	4,5 - 16,4	60	60	-	-	-	-

Pacifyre® MK II system	<p>Annex 2 Flexible wall</p>
2.2 Fire resistance values	

<p>PVC Polyvinylchloride (PVC-U, PVC-C)</p>								
		Outer-Ø	Thickness	E	I	E	I	E
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,9 - 3,6	90	90	90	90	120	120	
≤ 50	1,9 - 5,6	90	90	90	90	120	120	
≤ 75	1,9 - 8,1	90	90	90	90	120	120	
≤ 110	2,0 - 5,2	90	90	90	90	120	120	
	5,3 - 10,0	120	120	-	-	90	90	
	10,1 - 12,3	90	90	-	-	90	90	
≤ 160	3,2 - 11,8	90	90	-	-	-	-	
≤ 180	2,5 - 11,8	90	90	-	-	-	-	
	11,9 - 13,3	60	60	-	-	-	-	

<p>ML Multilayer (PEX/AL/PEX, PE-RT/AL/PE-RT, PP-R/AL/PP-R)</p>							
		Outer-Ø	Thickness	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	3	90	90	-	-	-	-
≤ 75	3,0 - 7,5	90	45	-	-	-	-

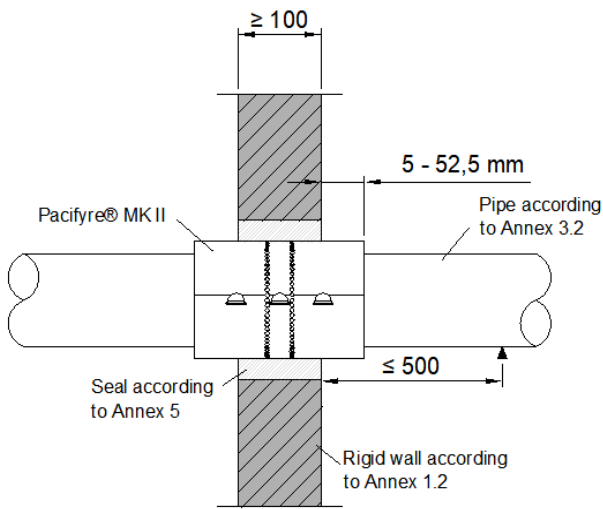
<p>MIXED (PE - PP - PVC)</p>							
		Outer-Ø	Thickness	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 110	2,0 - 10,0	60	60	-	-	60	60

Pacifyre® MK II system

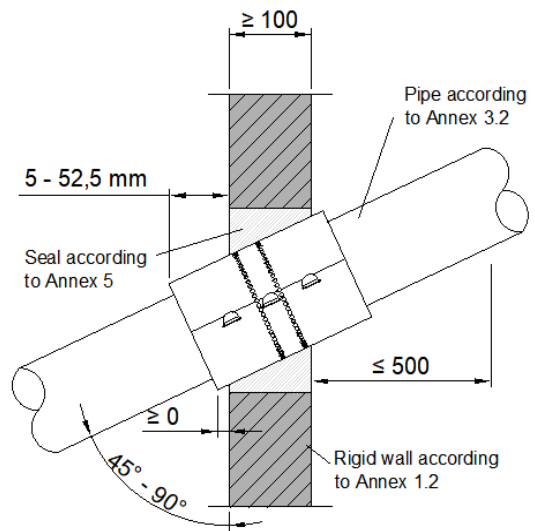
2.2 Fire resistance values

Annex 2
Flexible wall

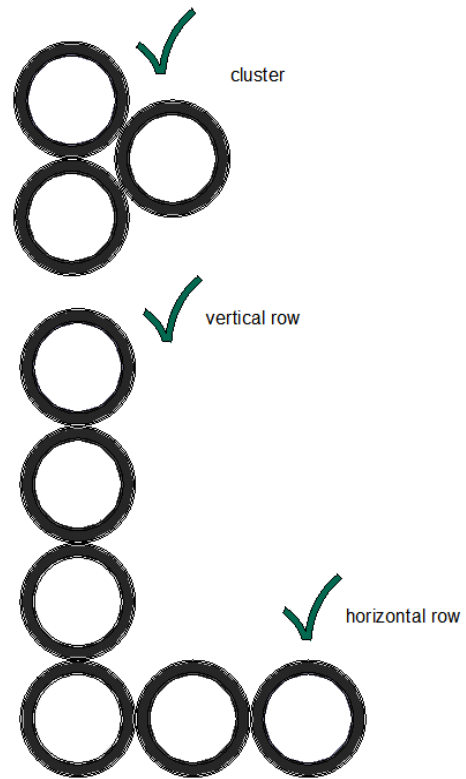
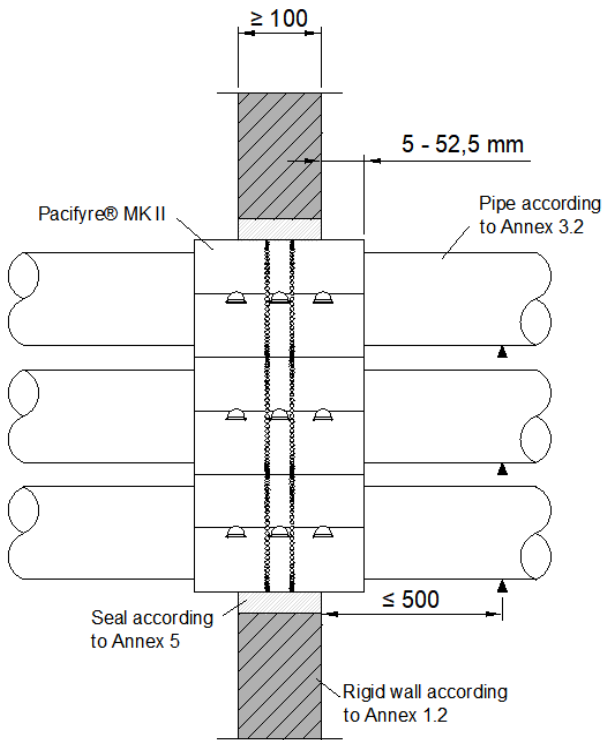
Perpendicular to the surface:



Angled to the surface:



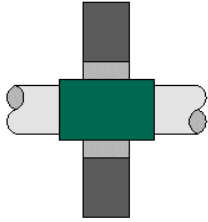
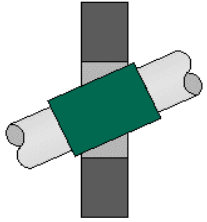
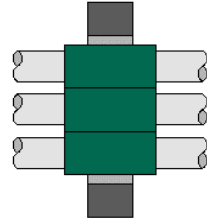
Perpendicular to the surface with a "zero-distance" in between the collars:

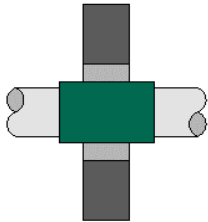
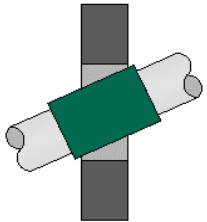
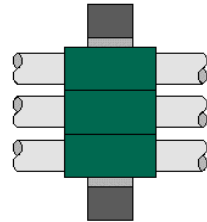


Pacifyre® MK II system

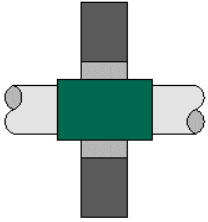
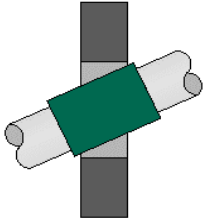
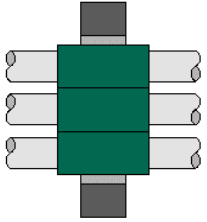
3.1 Installation guideline

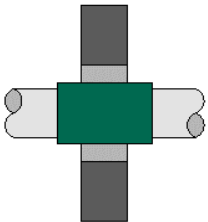
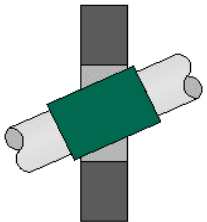
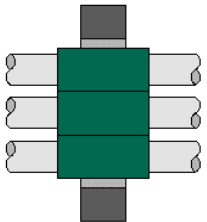
**Annex 3
Rigid wall**

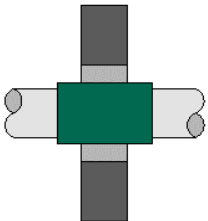
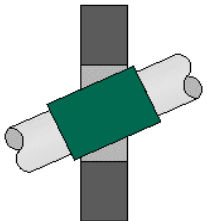
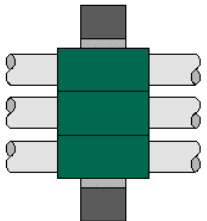
<p>PE Polyethylene Pipes (PE-HD, PE-LD, PE 100)</p>							
		E	I	E	I	E	I
Outer-Ø	Thickness	[min]	[min]	[min]	[min]	[min]	[min]
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 3,0	120	120	90	90	120	120
≤ 50	1,8 - 4,6	120	120	90	90	120	120
≤ 75	2,7 - 6,8	120	120	90	90	120	120
≤ 110	2,7 - 15,1	120	120	90	90	120	120
≤ 160	3,1 - 9,5	120	120	-	-	-	-
	9,6 - 14,6	60	60	-	-	-	-
≤ 180	3,1 - 4,4	90	90	-	-	-	-
	4,5 - 24,6	60	60	-	-	-	-

<p>PP Polypropylene Pipes (PP, PP-H, PP-R)</p>							
		E	I	E	I	E	I
Outer-Ø	Thickness	[min]	[min]	[min]	[min]	[min]	[min]
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 2,8	120	120	-	-	120	120
≤ 50	1,8 - 4,6	120	120	-	-	120	120
≤ 75	1,9 - 6,8	120	120	-	-	120	120
≤ 110	2,7 - 10,0	120	120	-	-	120	120
≤ 160	3,1 - 4,0	120	120	-	-	-	-
	4,1 - 14,6	60	60	-	-	-	-
≤ 180	3,1 - 4,4	60	90	-	-	-	-
	4,5 - 16,4	60	60	-	-	-	-

Pacifyre® MK II system	<p>Annex 3 Rigid wall</p>
3.2 Fire resistance values	

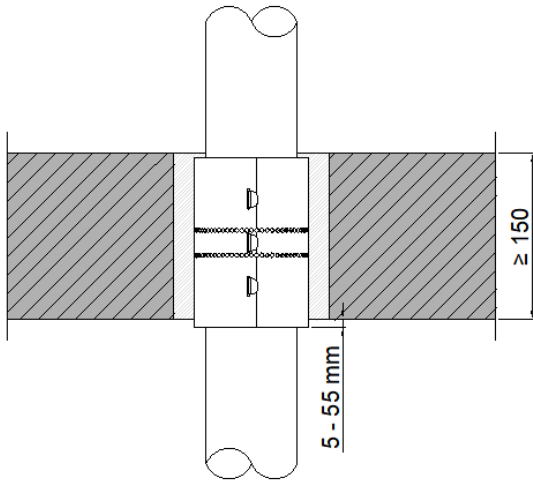
<p>PVC Polyvinylchloride (PVC-U, PVC-C)</p>							
		E	I	E	I	E	I
Outer- \varnothing	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,9 - 3,6	120	120	90	90	120	120
≤ 50	1,9 - 5,6	120	120	90	90	120	120
≤ 75	1,9 - 8,1	120	120	90	90	120	120
≤ 110	2,0 - 8,1	120	120	90	90	120	120
	8,2 - 10,0	120	120	-	-	90	90
	10,1 - 12,3	90	90	-	-	90	90
≤ 160	3,2 - 11,8	120	120	-	-	-	-
≤ 180	2,5 - 11,8	90	90	-	-	-	-
	11,9 - 13,3	60	60	-	-	-	-

<p>ML Multilayer (PEX/AL/PEX, PE-RT/AL/PE-RT, PP-R/AL/PP-R)</p>							
		E	I	E	I	E	I
Outer- \varnothing	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 75	3,0 - 7,5	120	120	-	-	-	-

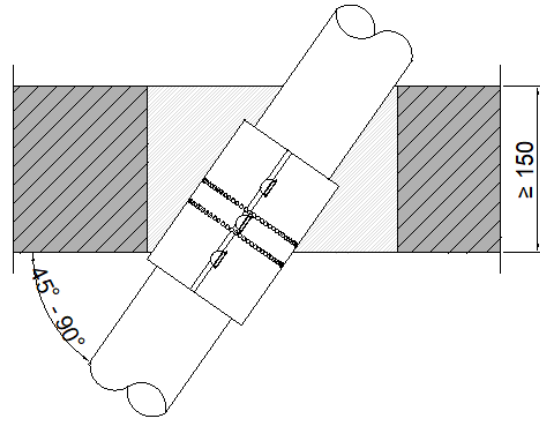
<p>MIXED (PE - PP - PVC)</p>							
		E	I	E	I	E	I
Outer- \varnothing	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 110	2,0 - 10,0	60	60	-	-	60	60

Pacifyre® MK II system	<p>Annex 3 Rigid wall</p>
3.2 Fire resistance values	

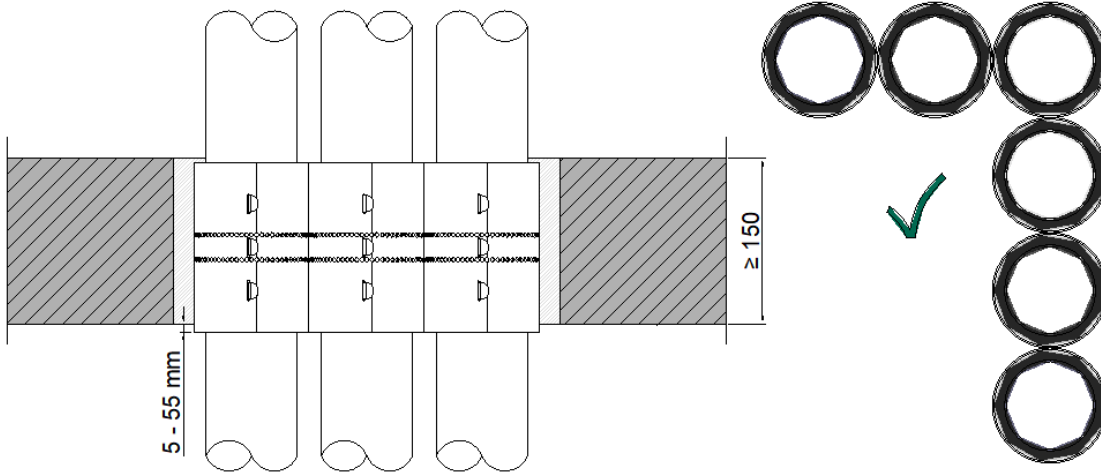
Perpendicular to the surface:



Angled to the surface:



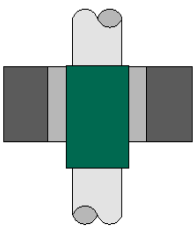
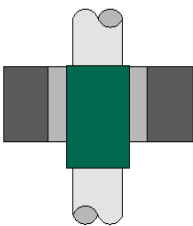
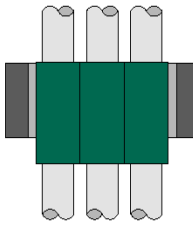
Perpendicular to the surface with a "zero-distance" in between the collars:

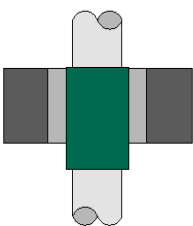
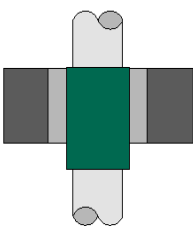
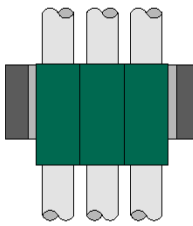


Pacifyre® MK II system

4.1 Installation guideline

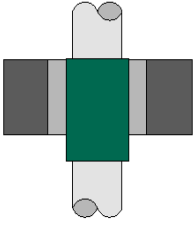
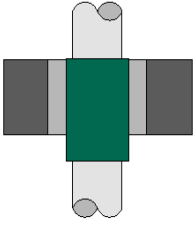
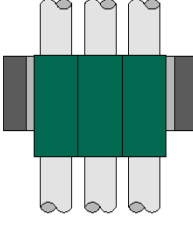
Annex 4
Rigid floor

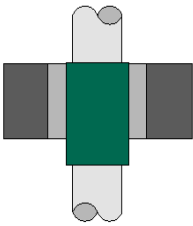
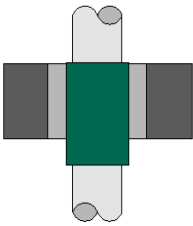
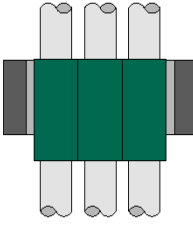
<p style="text-align: center;">PE Polyethylene Pipes (PE-HD, PE-LD, PE 100)</p>							
		Mortar		Acrylic		Mortar	
Outer-Ø	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 3,0	120	120	120	120	120	120
≤ 50	1,8 - 4,6	120	120	120	120	120	120
≤ 75	2,7 - 6,8	120	120	120	120	120	120
≤ 110	2,7 - 15,1	120	120	120	120	120	120
≤ 160	3,1 - 4,0	120	120	90	90	-	-
	4,1 - 9,5	120	120	60	60	-	-
	9,6 - 14,6	60	60	60	60	-	-

<p style="text-align: center;">PP Polypropylene Pipes (PP, PP-H, PP-R)</p>							
		Mortar		Acrylic		Mortar	
Outer-Ø	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,8 - 2,8	120	120	120	120	120	120
≤ 50	1,8 - 4,6	120	120	120	120	120	120
≤ 75	1,9 - 6,8	120	120	120	120	120	120
≤ 110	2,0 - 15,1	120	120	120	120	120	120
≤ 160	3,1 - 4,0	120	120	60	60	-	-
	4,1 - 14,6	60	60	45	45	-	-

Pacifyre® MK II system

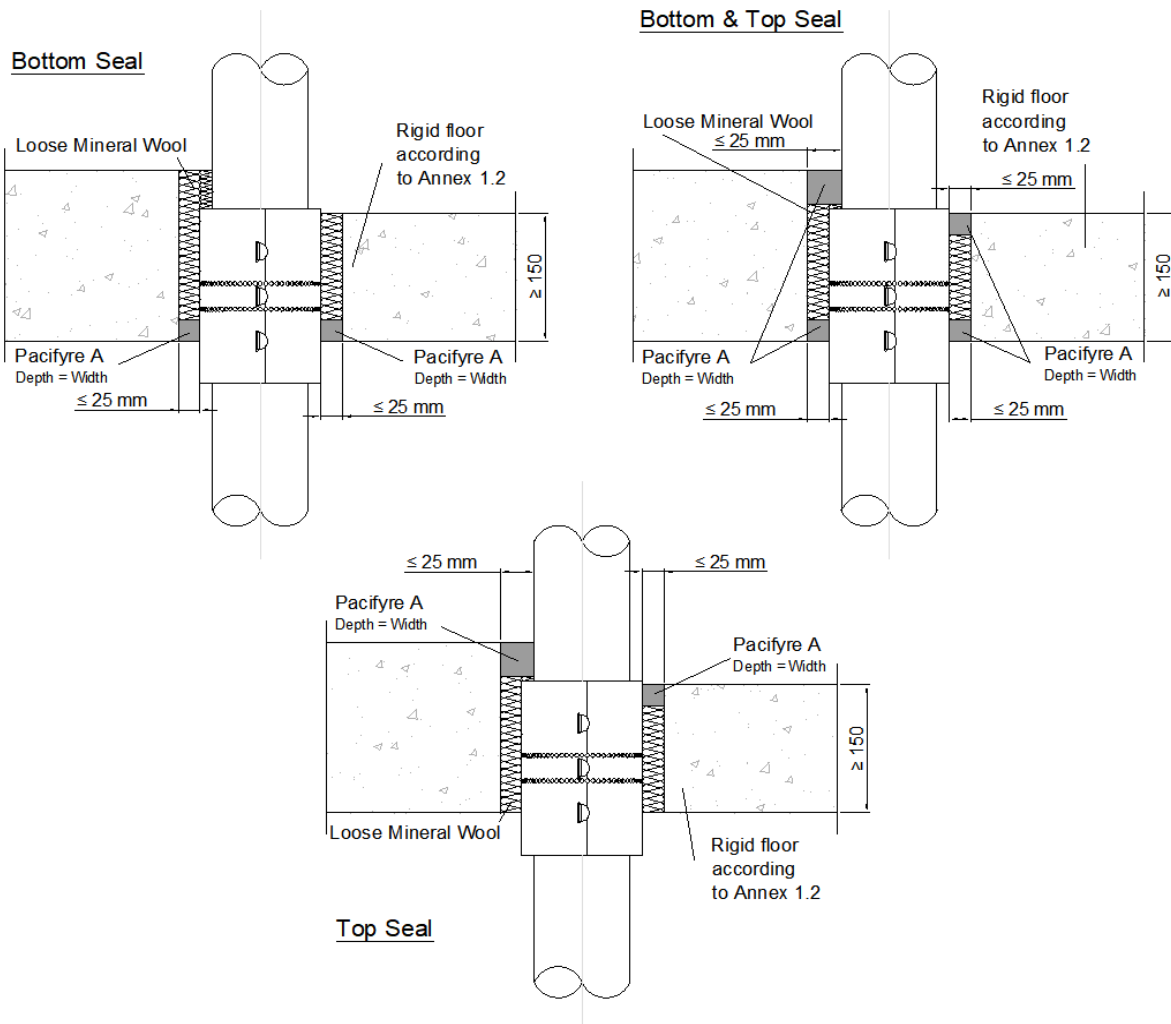
4.2 Fire resistance values**Annex 4
Rigid floor**

<p>PVC Polyvinylchloride (PVC-U, PVC-C)</p>							
		Mortar		Acrylic		Mortar	
Outer-Ø	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 32	1,9 - 3,6	120	120	120	120	120	120
≤ 50	1,9 - 5,6	120	120	120	120	120	120
≤ 75	1,9 - 8,1	120	120	120	120	120	120
≤ 110	2,0 - 8,1	120	120	120	120	120	120
≤ 160	2,5 - 3,2	120	120	120	120		
	3,3 - 11,8	120	120	90	90		

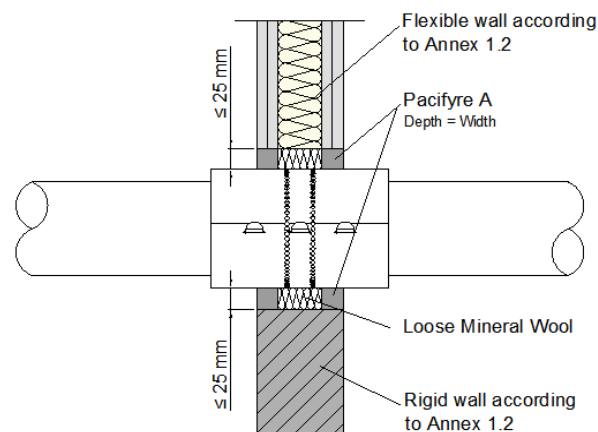
<p>ML Multilayer (PEX/AL/PEX, PE-RT/AL/PE-RT, PP-R/AL/PP-R)</p>							
		Mortar		Acrylic		Mortar	
Outer-Ø	Thickness	E	I	E	I	E	I
[mm]	[mm]	[min]	[min]	[min]	[min]	[min]	[min]
≤ 75	3,0 - 7,5	120	120	120	60	-	-

Pacifyre® MK II system	Annex 4 Rigid floor
4.2 Fire resistance values	

Pacifyre Acrylic sealant - Floor applications (thin and thick floor situations)



Pacifyre Acrylic sealant - Wall application (rigid- and/or flexible walls)

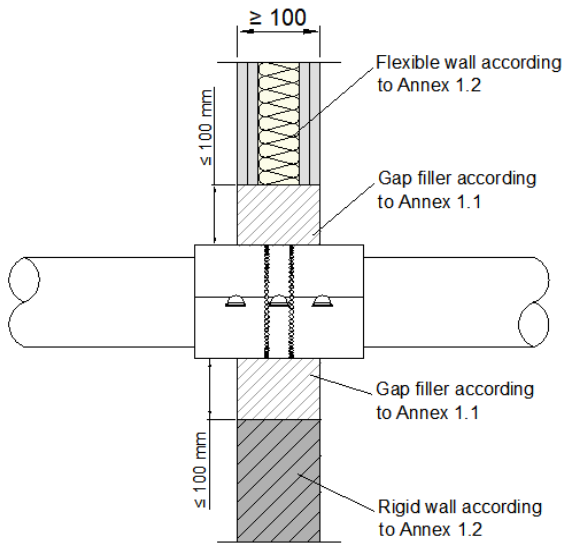


Pacifyre® MK II system

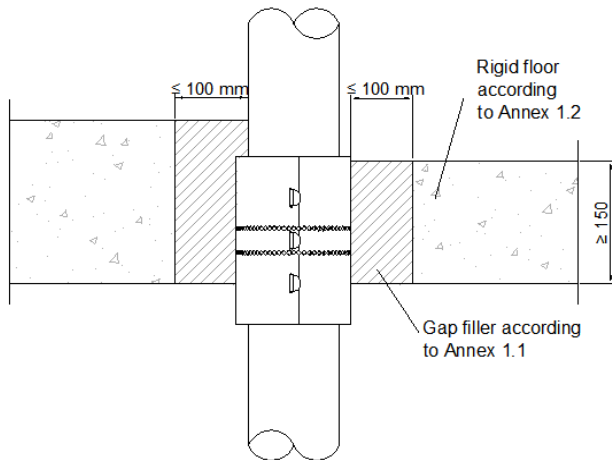
5.1 Installation guideline

**Annex 5
Sealing options**

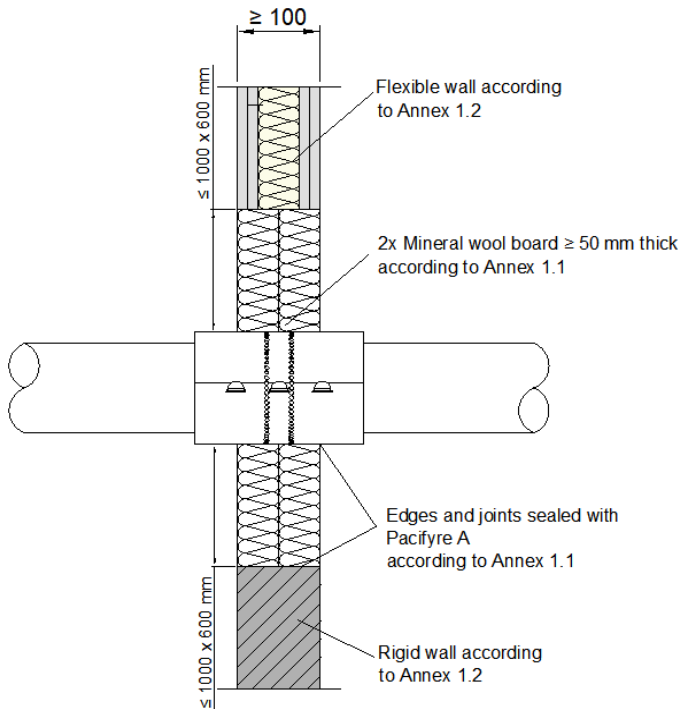
Gap filler - Wall application :



Gap filler - Floor application:



Mineral Wool Board - Wall application:



Pacifyre® MK II system

5.1 Installation guideline

Annex 5
Sealing options