

CLASSIFICATION REPORT

IWS and WPCS

PP, PE-HD and PVC pipes

Name of sponsor: Intumescent Systems Ltd and Envirograf Europe

Product name: PP, PE-HD and PVC pipes. IWS, WPCS Fire Collar, P58 AM mastic

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Client information

Client: Envirograf Europe ApS

Address: Lyngvejen 7, Sædding

6900 Skjern

Denmark

Client: Intumescent Systems Ltd

Address: Barfrestone, Dover

CT15 7JG KENT

United Kingdom

The results relate only to the items tested. The classification report should only be reproduced in extenso – in extracts only with a written agreement with this institute.

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1. Introduction

This classification report defines the classification assigned to the product in accordance with the procedures given in EN 13501-2:2016.

This classification report includes the direct field of application of the test results.

2. Details of classified product

General

Producer of product: Envirograf Europe ApS

The products were designated:

Pipes: PP, PE-HD and PVC

Pipe closure device: IWS and WPCS Fire Collar

Sealant: P58 AM mastic

The classification is valid for the following end use application: Penetration seals

Product description

The products are part of a penetration seal system for different pipe services penetrating a flexible or rigid wall horizontally, or a rigid deck vertically.

The first type of pipe closure device is a IWS sleeve/wrap with build-in insulation in the outer layer and an active intumescent component inside and wrapped in fibre reinforced tinfoil on all sides. The pipe closure device is placed around the pipe, and always has the same length as the thickness of the deck or wall it penetrates. The size of the active component is changing due to the size of the device. The second type of pipe closure device is a WPCS fire collar that is mounted directly on the supporting construction around the pipe.

The details of the product are described in the DBI test reports listed in section 3.

3. Reports in support of the classification

Test report

The product was successfully tested in accordance with EN 1366-3:2009. The evidence for this is given in the test reports listed below:

Reference test:				
Name of Laboratory	Name of sponsor	Test report file no.	Test method	Date of test
Danish Institute of Fire and Security Technology	Envirograf Europe ApS Intumescent Systems Ltd	PGA12059A dated 25-04-2022 (deck)	EN 1366-3:2009	14-12-2021
Danish Institute of Fire and Security Technology	Envirograf Europe ApS Intumescent Systems Ltd	PGA11952A dated 27-09-2021 (deck)	EN 1366-3:2009	02-06-2021
Danish Institute of Fire and Security Technology	Intumescent Systems Ltd and Envirograf Europe	PGA11952B dated 27-09-2021 (wall)	EN 1366-3: 2009	11-05-2021
Efectis Nederland BV	Intumescent Systems Ltd	R9284a[Rev.1] dated May 2016 (wall)	EN 1366-3:2009	18-06-2012

Efectis Nederland BV	Intumescent Systems Ltd	R9284b[Rev.1] dated August 2013 (wall)	EN 1366-3:2009	18-06-2012
Chiltern	Intumescent Systems Ltd.	RF12084 dated 23- 10-2012 (wall)	EN 1366-3: 2009	25-07-2012

EXAP report:			
Name of Laboratory	Name of sponsor	Test report file no.	EXAP standard
Danish Institute of Fire and Security Technology	Envirograf Europe ApS Intumescent Systems Ltd.	PHB10144A dated 17-06 - 2022	EN 15882-3:2009

Table A below shows the different systems this classification concerns:

System	Chapter:	Orientation:	Pipe type	Seal product type	Pipe close device
IWS	4.4 - 4.13	Deck / Wall	PP, PE-HD and PVC	P58 AM mastic	IWS
WPCS	5.0 - 5-4	Deck / Wall	PP, PE-HD and PVC	P58 AM mastic	WPCS
IP42	6	Wall	PVC trunking	P58 AM mastic	IP42

Test results

DBI test reports concern many different pipe types. For this classification, we look at the two systems described in table A. Layout drawings of the tested systems are stamped and attached to the end of this report.

4. Classification and field of application

4.1 Reference

This classification has been carried out in accordance with clause 7.5.8 of EN 13501-2:2016.

4.2 Field of application - Supporting construction

The application of all classified products is only valid when used with the following supporting constructions:

For penetration through rigid floors (concrete, masonry separating elements or aerated concrete)
 minimum density 550 kg/m³ (§13.2.1)
 minimum thickness of 150 mm (§13.2.1)
 - For pipe closure devices the length of the device must be increased with the thickness

For penetration through rigid walls (concrete, masonry or aerated concrete)
 minimum density 550 kg/m³ (§13.2.1)
 minimum thickness of 95 mm. (§13.2.1)
 - For pipe closure devices the length of the device must be increased with the thickness

For penetration through flexible walls
 Resistance to fire classification of minimum EI 120 for penetrations classified EI 120
 Resistance to fire classification of minimum EI 90 for penetrations classified EI 90
 Resistance to fire classification of minimum EI 60 for penetrations classified EI 60

With the following conditions for the flexible wall:
 Minimum thickness of 95 mm. (§13.2.2.1 2)
 - For pipe closure devices the length of the device must be increased with the thickness

The overall board thickness is 25 mm or greater on both sides of the wall (§13.2.2.1 3))

Minimum two board layers on each side (§13.2.2.1 4))

Filled with insulation of class A1 or A2 according to EN 13501-1.

The flexible walls can be constructed with steel studs, or they can be constructed with wooden studs, but no part of the penetration seal can be closer than 100 mm from a wooden stud and the cavity must in all cases be filled with insulation of class A1 or A2 according to EN 13501-1.

4.3 Field of application – General system description

Section 7 contains the individual classifications of all pipes.

For wall constructions, the classification is valid for fire resistance from either side.

For deck constructions the classification is only valid with fire from below.

Sealant around pipes:

Envirograf P58 AM mastic white sealant must be placed sloped from the pipes on both sides to prevent smoke from penetrating the penetration. Sizes of the sealant are described in the field of application for the different classifications.

The following text are field of application rules from EN 1366-3:2009

Orientation of penetration:

For protection of vertical or horizontal pipe penetrations as specified in the classifications in section 4.4 – section 6

Orientation of the pipe (§E.2.7.6.)

The plastic pipe can only be installed in 90-degree angle from the supporting construction.

Position of support for the service:

The distance between the surface of the supporting construction and the first support for the service shall not exceed 400 mm for floor and wall penetrations. (§13.4.3)

Pipe end configuration for plastic pipes (§E.2.7.3)

The classification of U/C is valid for the U/C and C/C configuration.

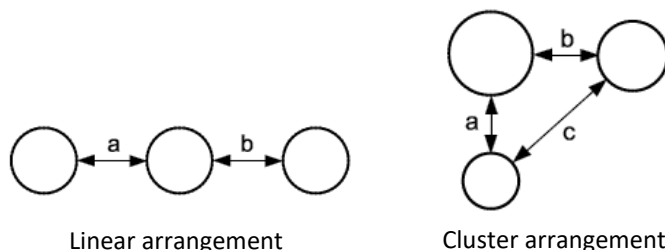
U/C = (Uncapped inside the furnace, capped outside the furnace)*

C/C = (Capped inside the furnace, Capped outside the furnace)

**Note: In real use if the wall has a resistance to fire demand from both sides the pipes need to be C/C.*

Distance between the services (§6.1)

The minimum distance between the outer sides of a single penetration or a cluster of pipes to another type of penetration must be 200 mm. Unless stated otherwise in the field of application in each classification chapter.



Linear arrangement

Cluster arrangement

Minimum distance between the aperture (drilled hole) for each pipe penetration is:

$a \geq 200 \text{ mm}$

$b \geq 200 \text{ mm}$

$c \geq 200 \text{ mm}$

Aperture

The gap between the IWS pipe closure device and the supporting construction must be maximum 8 mm.

The gap between the pipe and the supporting construction when using WPCS pipe closure device must be maximum 10 mm.

Changes of type of pipe material:

Pipes made from PE-HD according to EN 1519-1 are valid for pipes made from PE according to EN 12201-2, EN 1519-1 and EN 12666-1, for pipes made from ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1. (§E.2.7.4)

Extended field of application from EXAP PHB10144A according to EN 15882-3: 2009**Changes of type of pipe material: according to rule 4.2 table 5 (plastic pipes)**

It is permitted to use PVC pipes based on tests on PE and PP pipes of the same size and up to a diameter of 160 mm.

Changes in pipe dimensions: according to rule 4.2 table 5 (plastic pipes)

It is allowed to change the diameter and wall thickness of the range that has been tested. Seal thickness and depths must remain the same across the tested range. For pipe closure devices the thickness and length of the intumescent component must be the same any time.

Changes of position within thickness of separating element: according to rule A.2.7 (Pipe closure device)

It is permitted to increase the size or number of fixings or mechanical restraint of the pipe closure device.

4.4 Classification and field of application – IWS – PP Pipes - EI 120 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/U

For wall constructions, the classification is valid for fire resistance from either side.

For deck constructions the classification is only valid with fire from below.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter Ø40 with 1.8 mm pipe wall thickness, only for horizontal penetrations through wall constructions.

Pipe diameter Ø75 with 2.3 mm pipe wall thickness, only for vertical penetrations through deck constructions.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: Ø40 - the active component must be 3 mm in thickness.

Pipe: Ø75 - the active component must be 5 mm in thickness.

4.5 Classification and field of application – IWS – PP Pipes - EI 120 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/C

For deck constructions the classification is only valid with fire from below.

Not for wall constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is Ø75 - Ø110 mm.

Pipe wall thicknesses is shown in Annex A1.

Distance between the services in walls:

Pipes with a diameter of 110 mm and a minimum wall thickness of 3.4 mm can be installed in clusters.

In addition to the sketch in general description the minimum distance between the aperture (drilled hole) for this penetration seal is:

a ≥ 0 mm

b ≥ 0 mm

c ≥ 0 mm

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex A1.

4.6 Classification and field of application – IWS – PP Pipes - E 120 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: E 120 - C/U

For wall constructions, the classification is valid for fire resistance from either side.

Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is $\varnothing 40 - \varnothing 75$ mm.

Pipe wall thicknesses is shown in Annex B1.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Graph for active component interpolation range is shown in Annex B1.

4.7 Classification and field of application – IWS – PP Pipes - EI 90 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: **EI 90 - C/U**

For wall constructions, the classification is valid for fire resistance from either side.

Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is $\varnothing 40 - \varnothing 110$ mm.

Pipe wall thicknesses is shown in Annex C1.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex C1.

4.8 Classification and field of application – IWS – PP SN4 Wavin pipe - EI 120 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/C

For deck constructions the classification is only valid with fire from below.

Not for wall constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter Ø110 with 4.2 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: Ø110 - the active component must be 8 mm in thickness.

4.9 Classification and field of application – IWS – PE - HD Pipes - EI 120 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/C

For wall constructions, the classification is valid for fire resistance from either side.

For deck constructions the classification is only valid with fire from below.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is Ø40 - Ø110 mm only for horizontal penetrations through wall constructions.

Pipe wall thicknesses is shown in Annex D1.

Pipe diameter range is Ø40 - Ø110 mm only for vertical penetrations through deck constructions.

Pipe wall thicknesses is shown in Annex E1.

Distance between the services in walls:

Vertical (deck) pipe with a diameter of 110 mm and wall thickness of minimum 3.5 mm can be installed in clusters.

In addition to the sketch in general description the minimum distance between the aperture (drilled hole) for this penetration seal is:

a ≥ 0 mm

b ≥ 0 mm

c ≥ 0 mm

All other pipes for this classification have the field of application in section 4.3.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex D1 for horizontal penetration and E1 for vertical.

4.10 Classification and field of application – IWS – PE - HD Pipes mounted in Slab- EI 120 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/C

For deck constructions the classification is only valid with fire from below.

Not for wall constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is $\varnothing 40 - \varnothing 75$ mm only for horizontal penetrations through deck constructions.

Pipe wall thicknesses is shown in Annex F1.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Slab type:

Pipes must be installed in Envirograf product 4, 60 mm mineral wool slab.

Slab position:

In 150 mm aerated concrete it must be placed 60 mm from the bottom and 30 mm from top.

Slab size:

Maximum 1200 x 600 x 60 mm. Length and width can be smaller but 60 mm in thickness must remain the same.

For floor constructions, result from tests with a penetration seal length of minimum 1000 mm apply to any length as long as the perimeter length to seal area ratio is not smaller than that of the tested penetration seal. (§13.5.2) The distance to the seal edge must always be respected.
The perimeter length to seal area ratio must be minimum 5.0

Distance between the pipes and seal edge in the slab:

Distance between pipes and the seal edge ≥ 200 mm.

Distance between pipes in the slab ≥ 200 mm.

Slab sealant:

White sealant must be placed on both sides on all edges of the slab.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex F1.

4.11 Classification and field of application – IWS – PVC U Pipes - EI 120 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/U

For deck constructions the classification is only valid with fire from below.

Not for wall constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter $\varnothing 110$ with 4 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: $\varnothing 110$ - the active component must be 8 mm in thickness.

4.12 Classification and field of application – IWS – PVC U Pipes - EI 60 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 60 - C/U

For wall constructions, the classification is valid for fire resistance from either side.
Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter Ø110 with 4 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: Ø110 - the active component must be 8 mm in thickness.

4.13 Classification and field of application – IWS – PVC U Pipes mounted in slab - EI 60 U/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 60 - U/C

For wall constructions, the classification is valid for fire resistance from either side.
Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter Ø200 with 8 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Slab type:

Pipes must be installed in Envirograf product 4, 60 mm thick mineral wool slab.

Slab position:

The slab must be installed centered in the wall construction.

Slab size:

Maximum 1200 x 600 x 60 mm. Height and width can be smaller but 60 mm in thickness must remain the same.

Distance between the pipes and seal edge in the slab:

Distance between pipes and the seal edge \geq 130 mm.

Distance between pipes in the slab \geq 200 mm.

Slab sealant:

White sealant must be placed on both sides on all edges of the slab.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: \varnothing 200 - the active component must be 10 mm in thickness.

Sleeve must protrude 16 mm out on each side of the wall.

5. Classification and field of application – WPCS – PP Pipes - EI 90 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 90 - C/U

For wall constructions, the classification is valid for fire resistance from either side.

Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter \varnothing 40 with 1.8 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipe on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: \varnothing 40 - the active component must be 2 mm in thickness.

5.1 Classification and field of application – WPCS – PP Pipes - EI 60 C/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 60 - C/U

For wall constructions, the classification is valid for fire resistance from either side.
Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is $\varnothing 40$ - $\varnothing 110$ mm.
Pipe wall thicknesses is shown in Annex G1.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.
Width: 20 mm.
Depth: 2 mm.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex G1.

5.2 Classification and field of application – WPCS – PE-HD Pipes - EI 120 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 120 - C/C

For wall constructions, the classification is valid for fire resistance from either side.
For deck constructions the classification is only valid with fire from below.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter range is $\varnothing 40$ - $\varnothing 110$ mm, only for vertical penetrations through deck constructions.
Pipe wall thicknesses is shown in Annex H1.
WPCS closure device only on bottom side of the construction on vertical penetrations.

Pipe diameter $\varnothing 40$ with a wall thickness of 3 mm, only for horizontal penetrations through wall constructions.
WPCS closure device on both sides of the construction on horizontal penetrations.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 20 mm.

Depth: 2 mm.

Active component in the pipe closure device:

Graph for active component interpolation range is shown in Annex H1.

5.3 Classification and field of application – WPCS – PE-HD Pipes - EI 60 C/C.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 60 - C/C

For wall constructions, the classification is valid for fire resistance from either side.

For deck constructions the classification is only valid with fire from below.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Interpolation of any material must be considered together with enclosure: Table of product sizes.

Pipes:

Pipe diameter range is $\varnothing 40 - \varnothing 110$ mm, for both vertical and horizontal penetrations.

Pipe wall thicknesses for vertical penetrations through deck constructions are shown in Annex I1.

Pipe wall thicknesses for horizontal penetrations through wall constructions are shown in Annex J1.

WPCS closure device only on bottom side of the construction on vertical penetrations.

WPCS closure device on both sides of the construction on horizontal penetrations.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 20 mm.

Depth: 2 mm.

Active component in the pipe closure device:

Graph for active component interpolation range in vertical penetrations is shown in Annex I1.

Graph for active component interpolation range in horizontal penetrations is shown in Annex J1.

5.4 Classification and field of application – WPCS – PVC U Pipes - EI 90 U/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 90 - U/U

For wall constructions, the classification is valid for fire resistance from either side.

Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Pipes:

Pipe diameter Ø40 with 3 mm pipe wall thickness.

Sealant:

White sealant must be placed sloped around the pipes on both sides of the construction.

Width: 50 mm.

Depth: 4 mm.

Active component in the pipe closure device:

The thickness of the active component according to pipe diameter is as follows:

Pipe: Ø40 - the active component must be 2 mm in thickness.

6. Classification and field of application – PVC trunking mounted in slab - EI 60 U/U.

The product is classified according to the following combinations of performance and classes as appropriate.

Fire resistance classification: EI 60 - U/U

For wall constructions, the classification is valid for fire resistance from either side.

Not for deck constructions.

Field of application

The classification is valid for the end use conditions in Field of application – General system description and the following end use conditions:

The test results are directly applicable to similar constructions where one or more changes in this field of application are made, and the construction continues to comply with the appropriate design code for its stiffness and stability. Other changes are not permitted.

Service:

PVC Trunking 50 x 100 mm.

Sealant:

White sealant must be placed around the PVC trunking on both sides of the construction.

Width: 20 mm.

Depth: 2 mm.

Active component in the pipe closure device:

Envirograf pads IP42 must be placed inside the trunking on both sides.

Slab type:

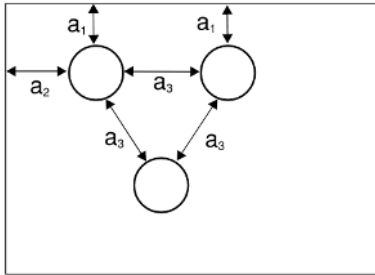
PVC trunking must be installed in Envirograf product 4, 60 mm thick mineral wool slab.

Slab position:

In 150 mm aerated concrete it must be placed mid depth in the wall.

Slab size:

Maximum 1200 x 600 x 60 mm. Height and width can be smaller but 60 mm in thickness must remain the same.

Distance between the pipes and seal edge in the slab:

Minimum distances from the service (PVC trunking) to aperture edge and other services:

- $a_1 \geq 0 \text{ mm}$
 $a_2 \geq 200 \text{ mm}$
 $a_3 \geq 200 \text{ mm}$

Slab sealant:

White sealant must be placed on both sides on all edges of the slab.

7. Individual classifications for each single penetration.

This classification is valid for the following end use applications in floors:

Test specimen name from test report:	Material	Diameter and Size:	Test report:	Integrity	Integrity & Insulation
	[-]	[mm]	[no.]	[-]	[-]
Seal 1.1	PP - Wavin	110	PGA12059A	E 120 C/C	EI 120 C/C
Seal 1.2	PE-HD - Geberit	110	PGA12059A	E 120 C/C	EI 120 C/C
Seal 1.3	PP SN4 - Wavin	110	PGA12059A	E 120 C/C	EI 120 C/C
Seal 3	PP - Wavin	75	PGA11952A	E 120 C/U	EI 120 C/U
Seal 4	PVC - Wavin	110	PGA11952A	E 120 C/U	EI 120 C/U
Seal 5	PE-HD - Geberit	40	PGA11952A	120	120
Seal 6	PE-HD - Geberit	75	PGA11952A	120	120
Seal 7	PE-HD - Geberit	110	PGA11952A	E 120 C/C	EI 120 C/C
Seal 13	PE-HD - Geberit	40	PGA11952A	E 120 C/C	EI 120 C/C
Seal 14	PE-HD - Geberit	75	PGA11952A	E 60 C/C	EI 60 C/C
Seal 15	PE-HD - Geberit	110	PGA11952A	E 120 C/C	EI 120 C/C
Seal 16	PE-HD - Geberit	40	PGA11952A	E 120 C/C	EI 120 C/C
Seal 17	PE-HD - Geberit	75	PGA11952A	E 120 C/C	EI 120 C/C
Seal 18	PE-HD - Geberit	110	PGA11952A	E 120 C/C	EI 120 C/C
Seal 24	PE-HD - Geberit	40	PGA11952A	E 120 C/C	EI 120 C/C
Seal 25	PE-HD - Geberit	75	PGA11952A	E 120 C/C	EI 120 C/C
Seal A2	PVC	40	R9284a[Rev.1]	E 120 U/U	EI 90 U/U
Pipe C	PVC	200	RF12084	E 60 U/C	EI 60 U/C
Seal 1	PE-HD - Geberit	40	PGA11952B	E 120 C/C	EI 120 C/C
Seal 2	PE-HD - Geberit	75	PGA11952B	E 120 C/C	EI 120 C/C
Seal 3	PE-HD - Geberit	110	PGA11952B	E 120 C/C	EI 120 C/C
Seal 4	PVC	110	PGA11952B	E 60 C/U	EI 60 C/U
Seal 5	PP - Wavin	40	PGA11952B	E 120 C/U	EI 120 C/U
Seal 6	PP - Wavin	75	PGA11952B	E 120 C/U	-

Seal 7	PP - Wavin	110	PGA11952B	E 90 C/U	EI 90 C/U
Seal 13	PP - Wavin	40	PGA11952B	E 120 C/U	EI 90 C/U
Seal 14	PP - Wavin	75	PGA11952B	E 120 C/U	EI 60 C/U
Seal 15	PE-HD - Geberit	110	PGA11952B	E 60 C/U	EI 60 C/U
Seal 16	PE-HD - Geberit	40	PGA11952B	E 120 C/C	EI 120 C/C
Seal 17	PE-HD - Geberit	75	PGA11952B	E 90 C/C	EI 60 C/C
Seal 18	PE-HD - Geberit	110	PGA11952B	E 60 C/C	EI 60 C/C
Seal W	PVC	50 x 100	R9284b[Rev.1]	E 120 U/U	EI 60 U/U

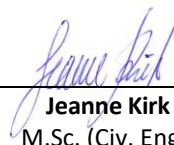
8. Limitations

This document does not represent type approval or certification of the element.

Danish Institute of Fire and Security Technology



Christian Basbøll
Resistance to Fire Engineer



Jeanne Kirk
M.Sc. (Civ. Eng.)

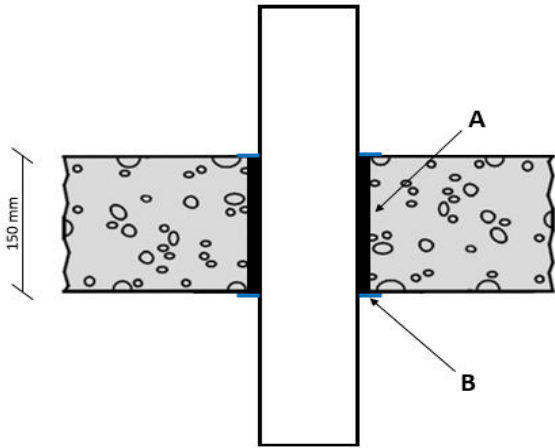
Envirograf Europe ApS

Lyngvejen 7, Sædding
6900 Skjern
Denmark

EI 120 C/C Vertical Pipe penetration

PP Pipes

Pipe closure device IWS



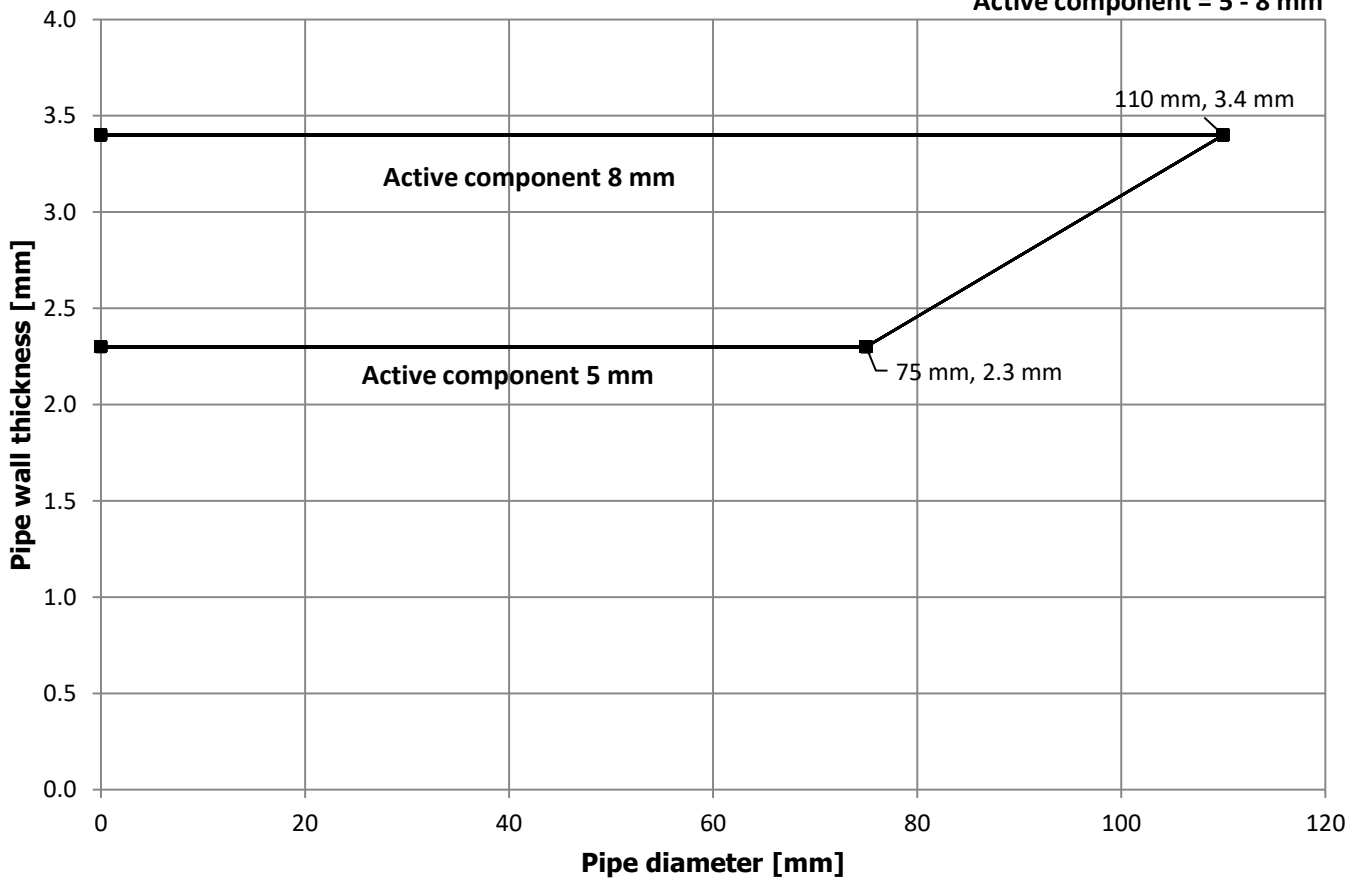
No.	Item	Description
1	Pipe	PP Pipes
2	Pipe closure	IWS
3	Deck	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 Firoblok IWS

B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range

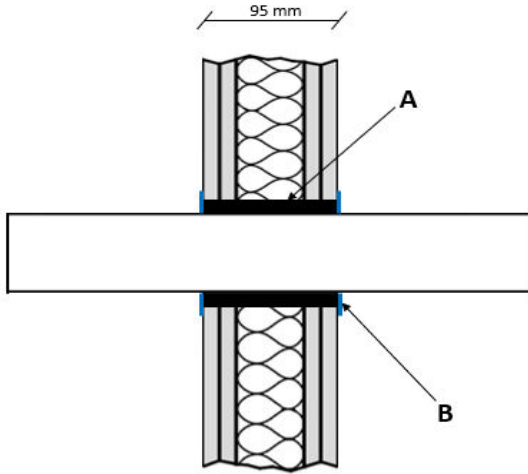
Active component = 5 - 8 mm



E 120 C/U Horizontal Pipe penetration

PP Pipes

Pipe closure device IWS

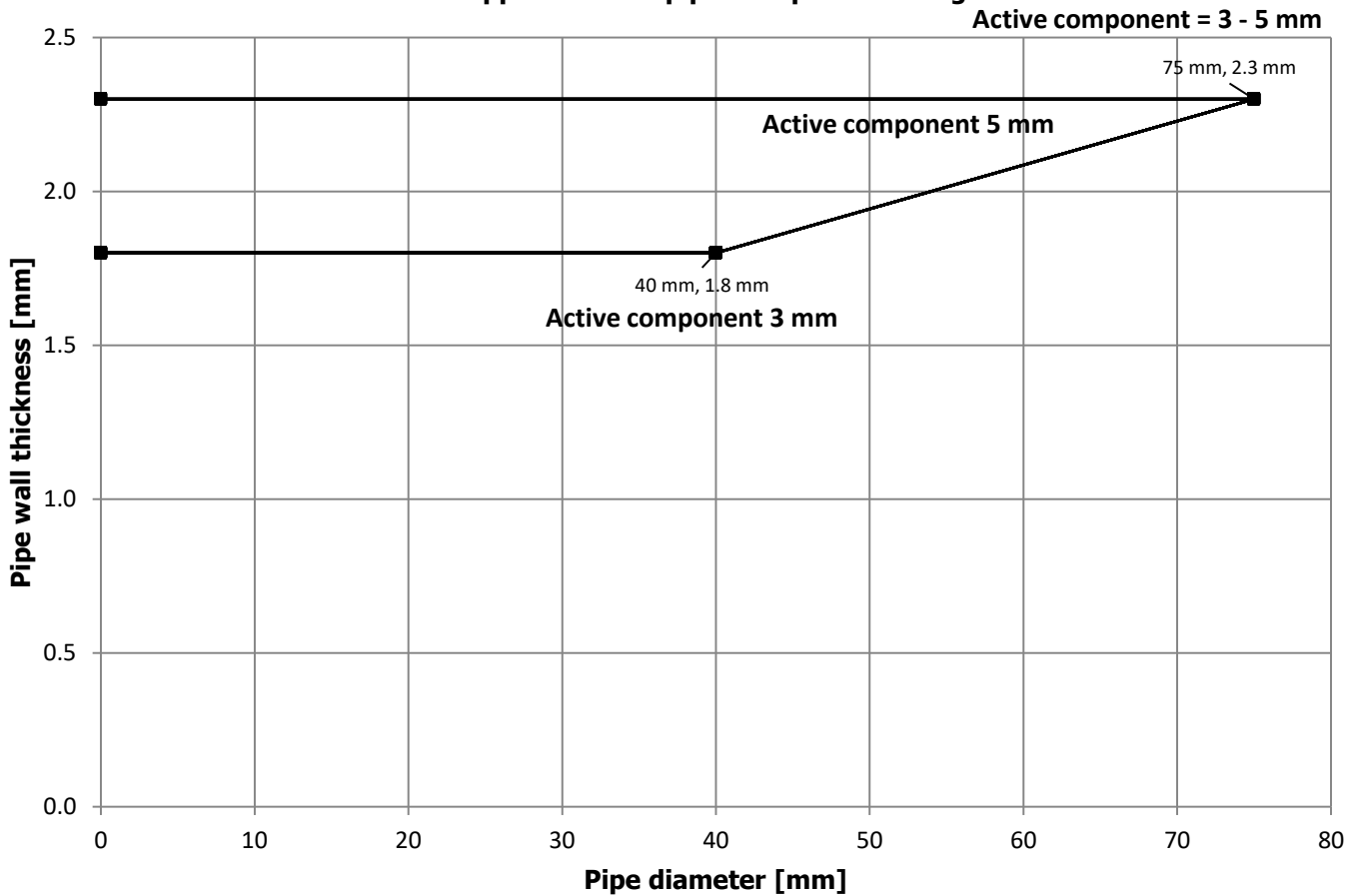


No.	Item	Description
1	Pipe	PP Pipes
2	Pipe closure	IWS
3	Wall	Flexible wall, Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS

B: Envirograf Product 58 AM Mastic

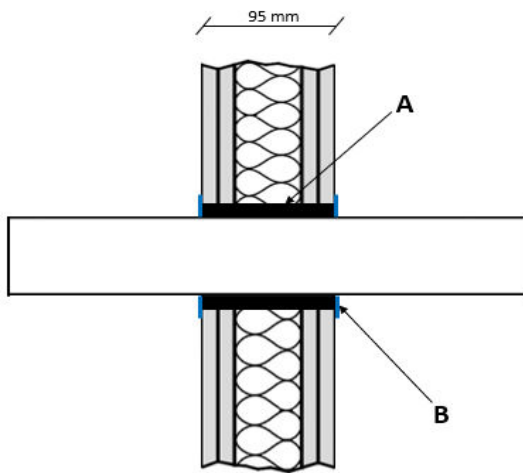
Field of application for pipe interpolation range



EI 90 C/U Horizontal Pipe penetration

PP Pipes

Pipe closure device IWS

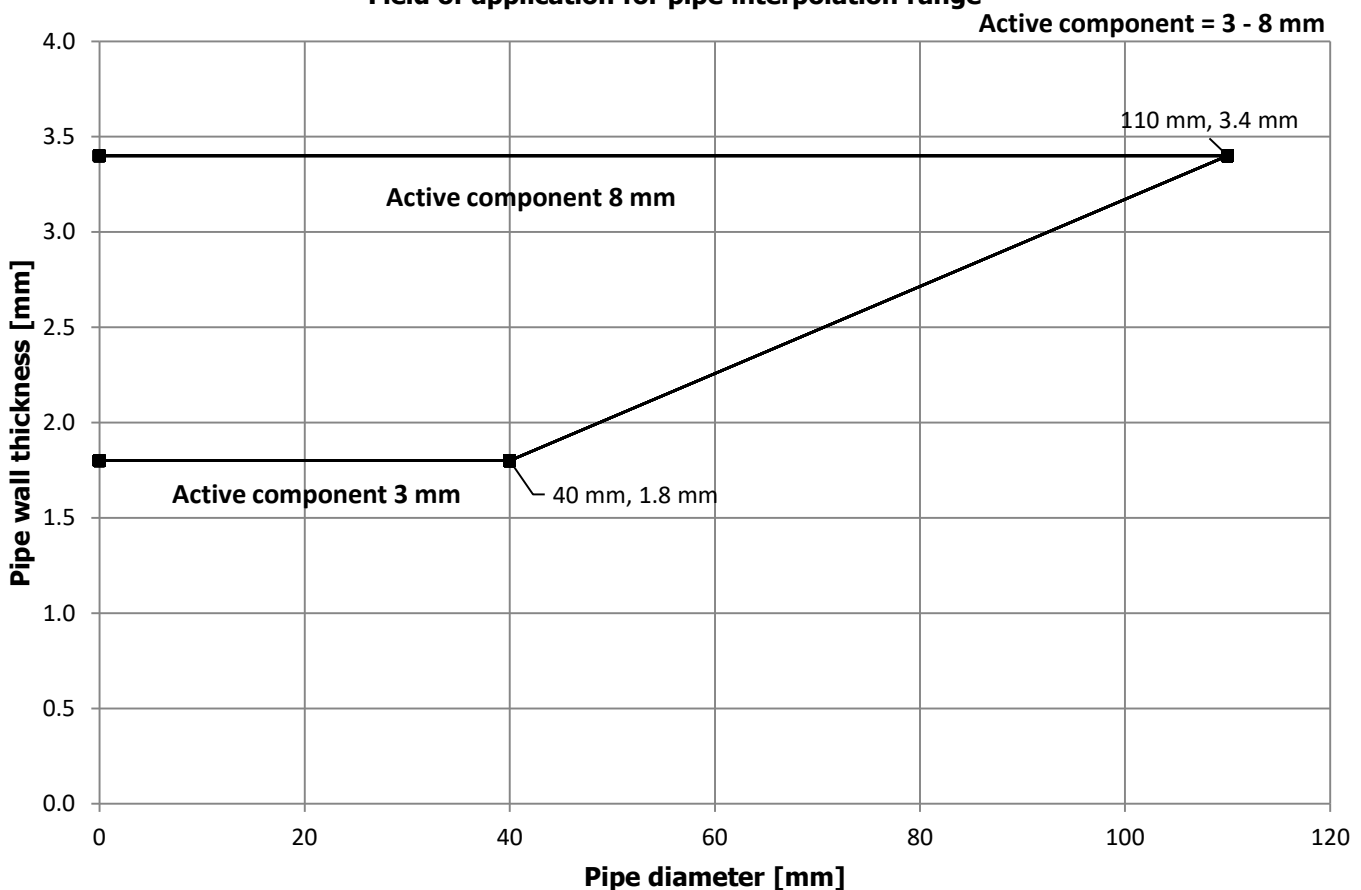


No.	Item	Description
1	Pipe	PP Pipes
2	Pipe closure	IWS
3	Wall	Flexible wall, Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

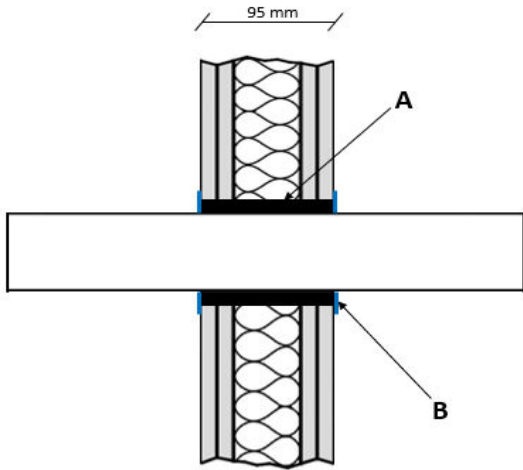
A: Envirograf Product 110 IWS

B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range



**EI 120 C/C Horizontal Pipe penetration
PE - HD Pipes
Pipe closure device IWS**

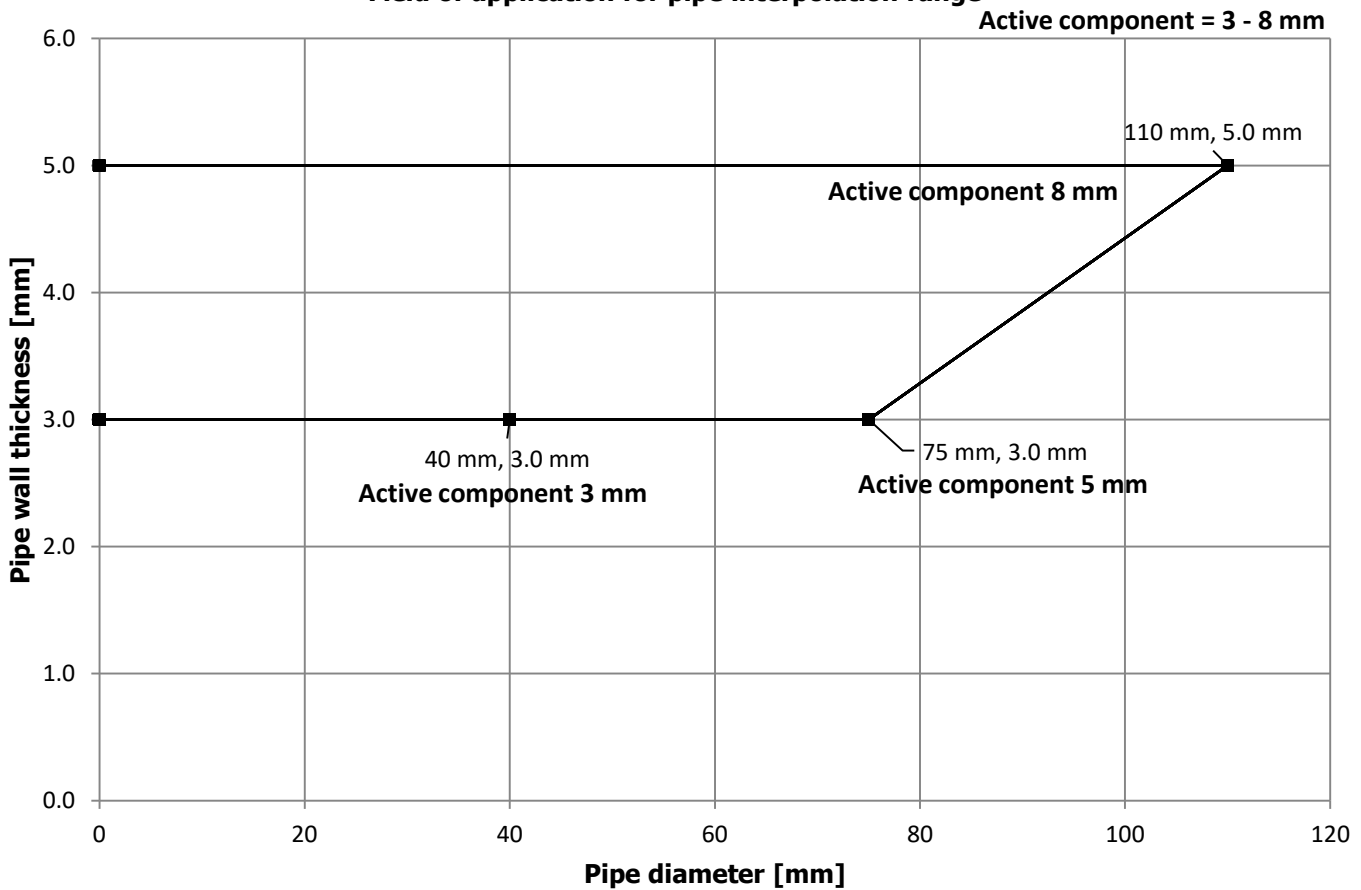


No.	Item	Description
1	Pipe	PE - HD Pipes
2	Pipe closure	IWS
4	Wall	Flexible wall, Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

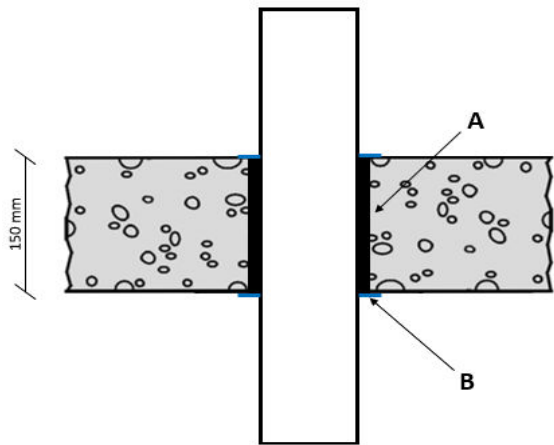
A: Envirograf Product 110 IWS

B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range



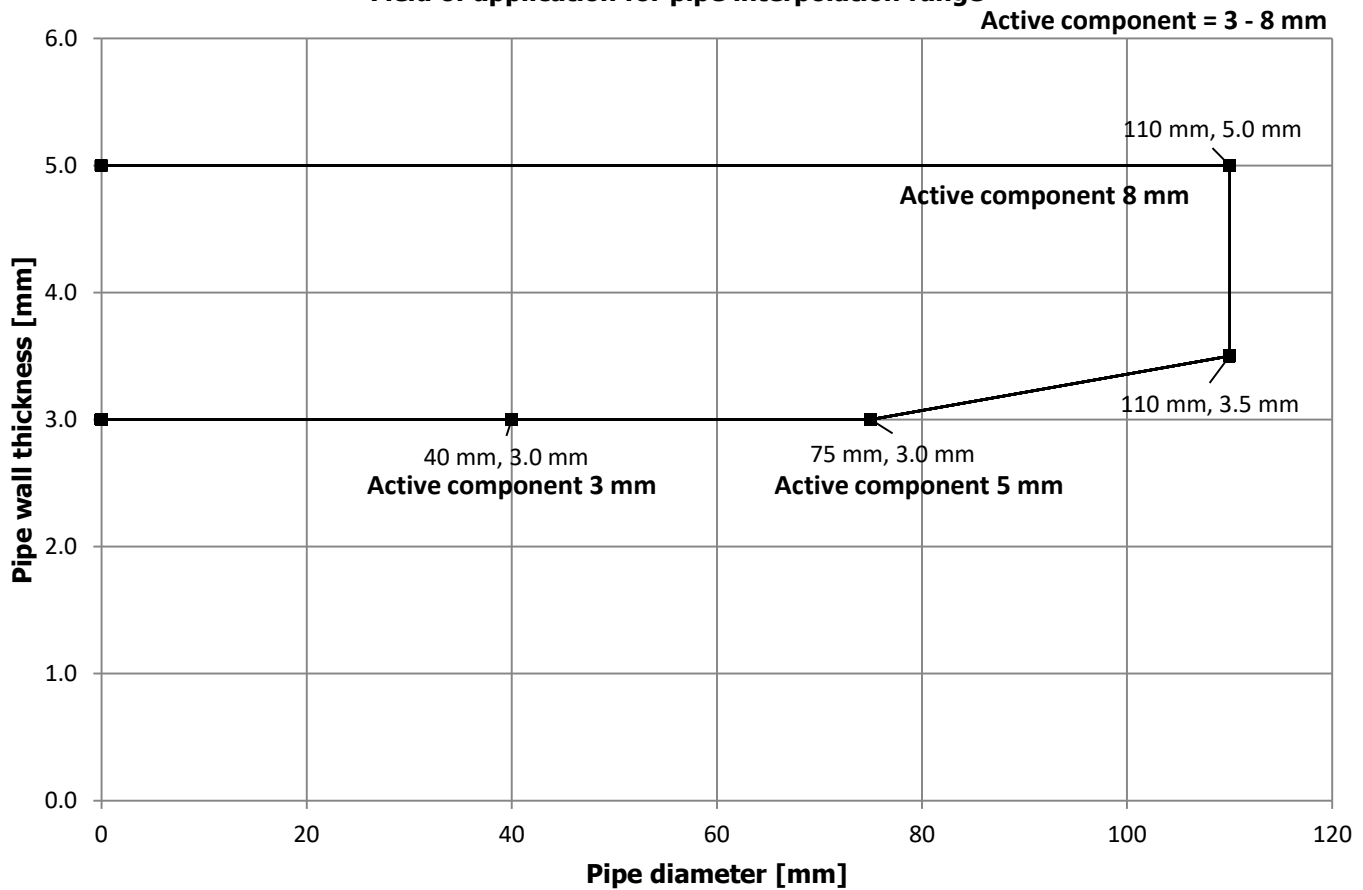
**EI 120 C/C vertical Pipe penetration
PE - HD Pipes
Pipe closure device IWS**



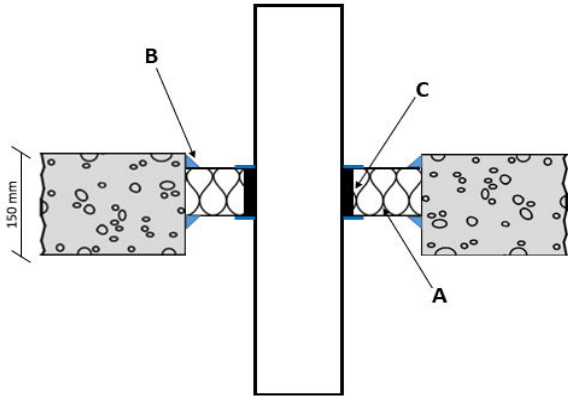
No.	Item	Description
1	Pipe	PE - HD Pipes
2	Pipe closure	IWS
3	Deck	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 Firoblok IWS
B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range



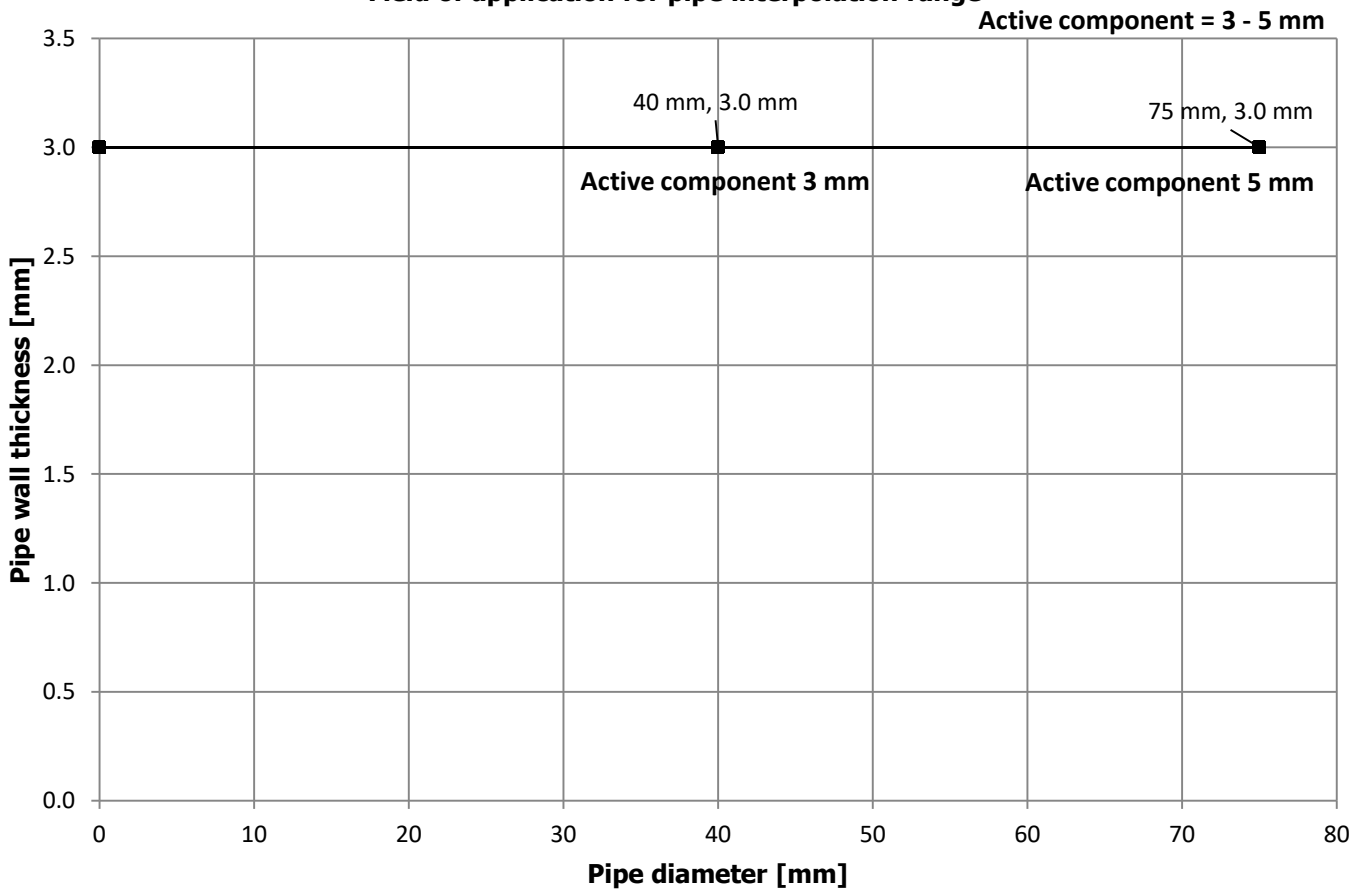
EI 120 C/C vertical Pipe penetration
PE - HD Pipes
Pipe closure device IWS
Envirograf product 4 mineral wool slab



No.	Item	Description
1	Pipe	PE - HD Pipes
2	Pipe closure	IWS
3	Slab	Envirograf product 4
4	Deck	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

- A: Envirograf Product 4 mineral wool slab
- B: Envirograf Product 58 AM Mastic
- C: Envirograf Product 110 IWS

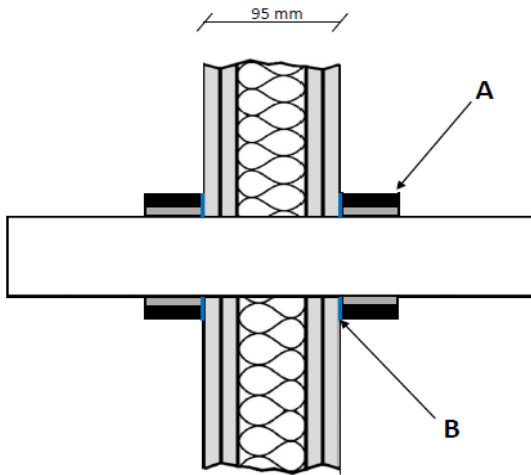
Field of application for pipe interpolation range



EI 60 C/U horizontal Pipe penetration

PP - Pipes

Pipe closure device WPCS

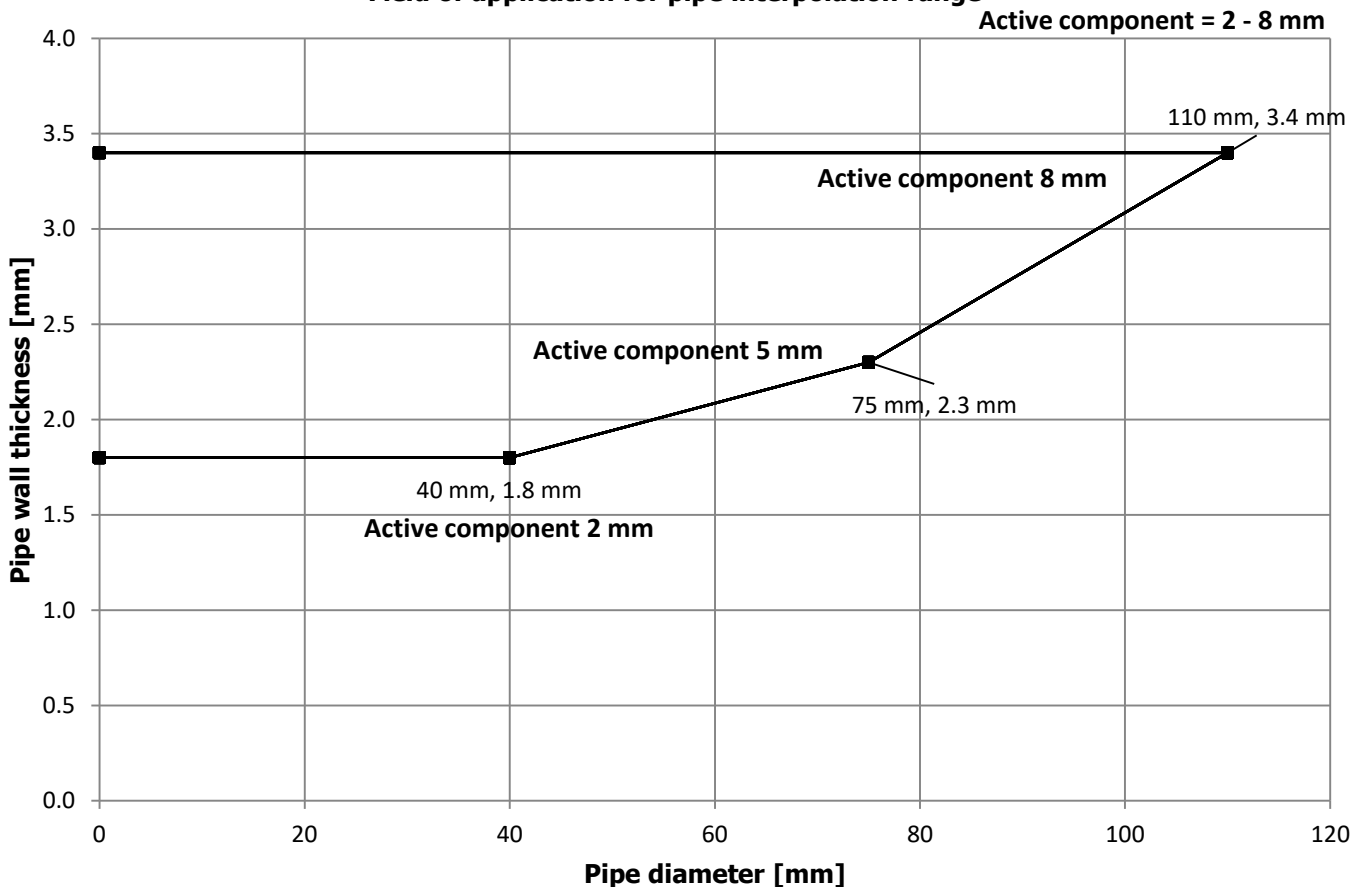


No.	Item	Description
1	Pipe	PP - Pipes
2	Pipe closure	WPCS
4	Wall	Flexible wall, Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

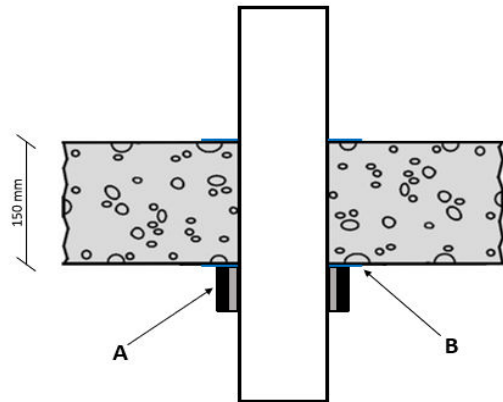
A: Envirograf WPCS Intumescent Collar

B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range



**EI 120 C/C vertical Pipe penetration
PE - HD - Pipes
Pipe closure device WPCS**

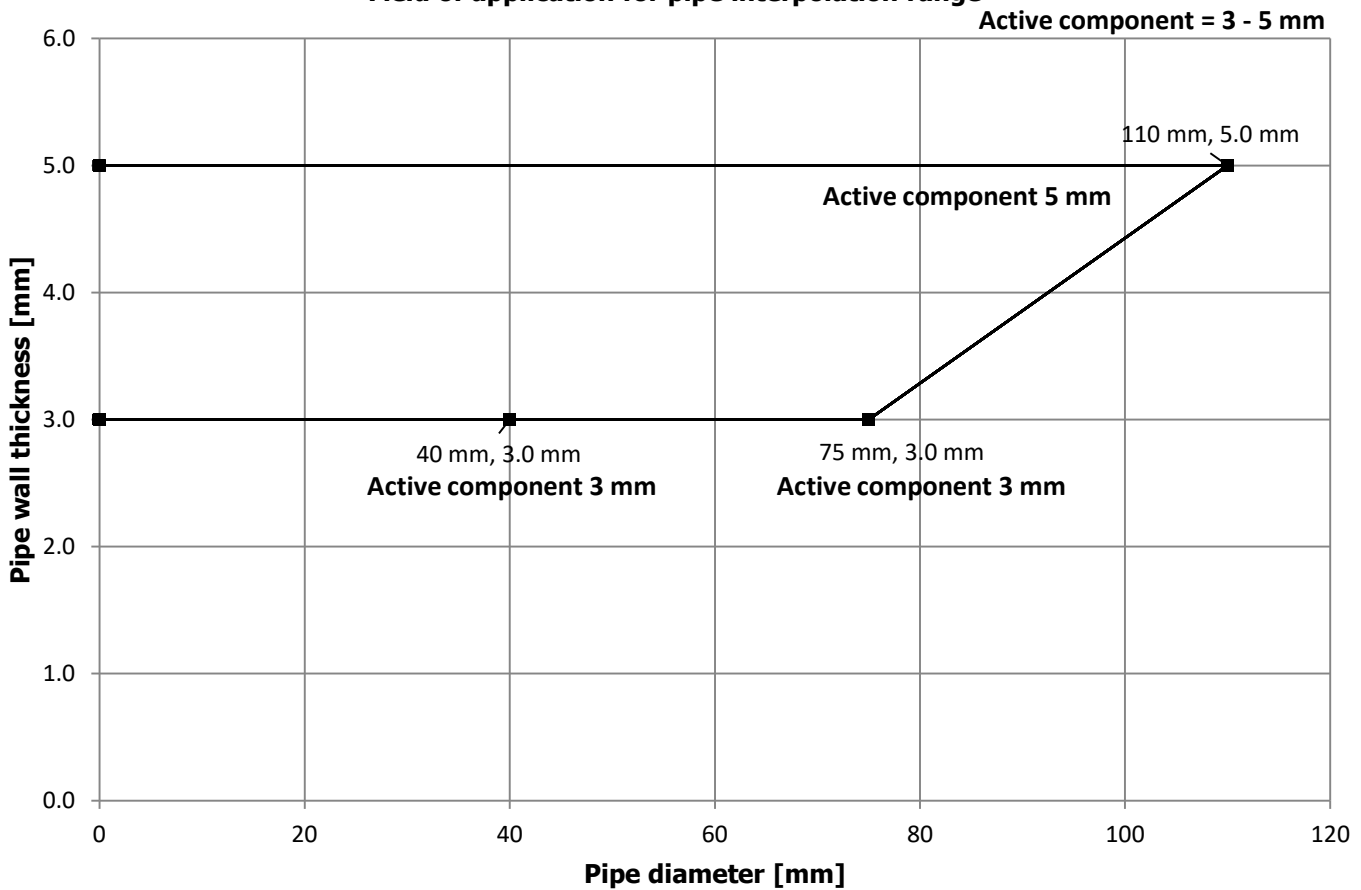


No.	Item	Description
1	Pipe	PE - HD - Pipes
2	Pipe closure	WPCS
4	Deck	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

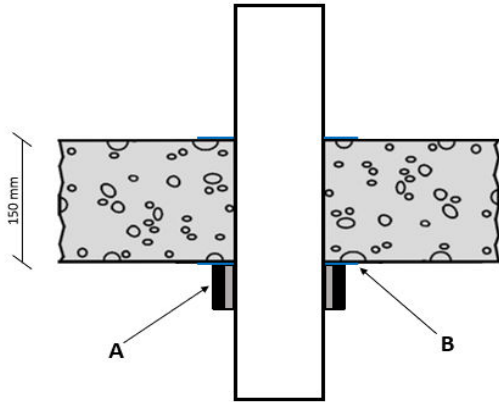
A: Envirograf Product 13 Intumescent Collar (WPCS)

B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range

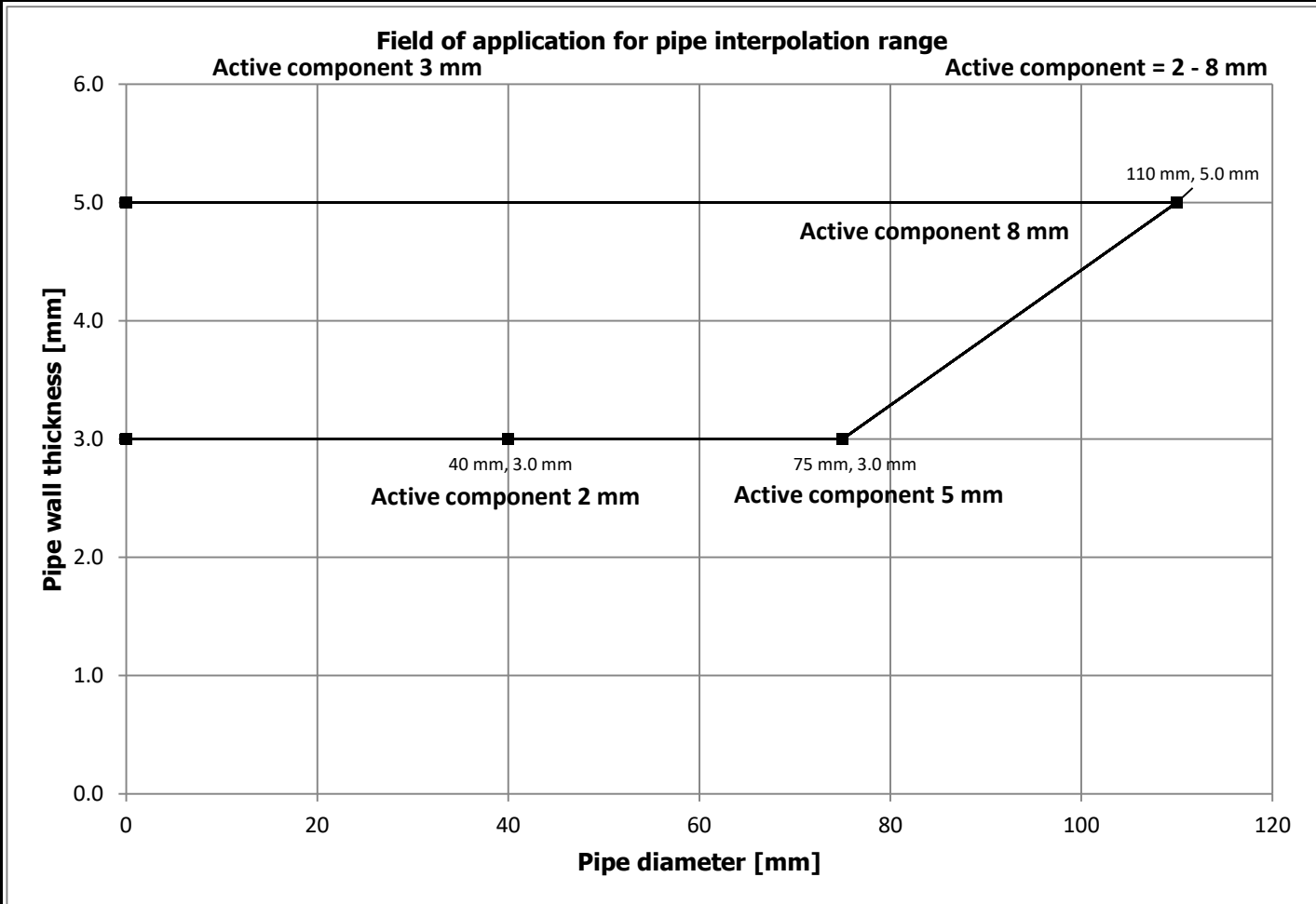


**EI 60 C/C vertical Pipe penetration
PE - HD - Pipes
Pipe closure device WPCS**

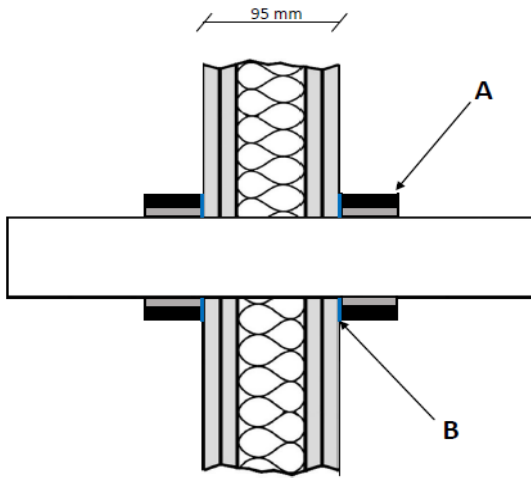


No.	Item	Description
1	Pipe	PE - HD - Pipes
2	Pipe closure	WPCS
4	Deck	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

A: Envirograf Product 13 Intumescent Collar (WPCS)
 B: Envirograf Product 58 AM Mastic



**EI 60 C/C vertical Pipe penetration
PE - HD - Pipes
Pipe closure device WPCS**



No.	Item	Description
1	Pipe	PE - HD - Pipes
2	Pipe closure	WPCS
4	Wall	Flexible wall, Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

A: Envirograf WPCS Intumescent Collar
B: Envirograf Product 58 AM Mastic

Field of application for pipe interpolation range

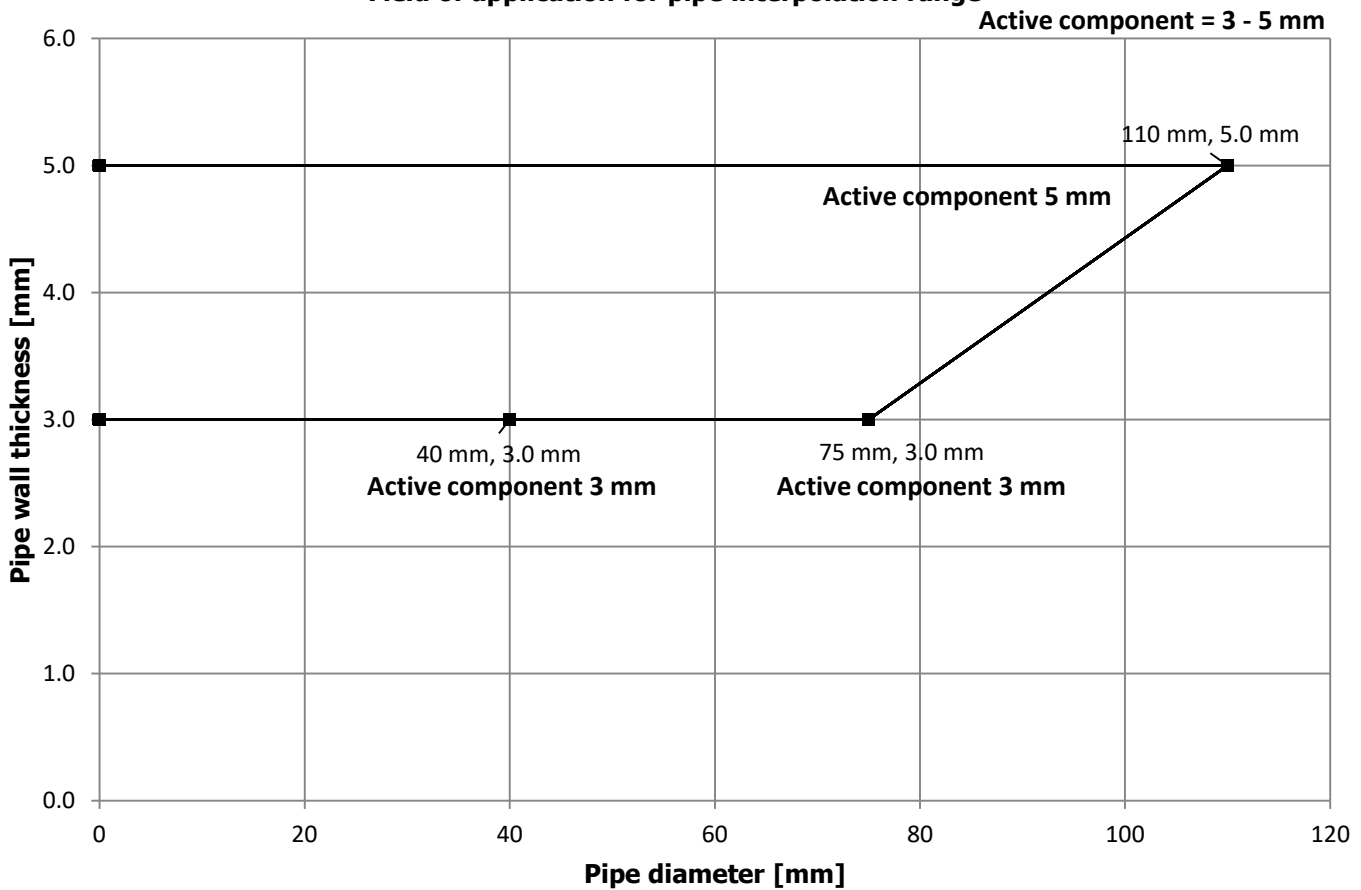


TABLE OF ENVIROGRAF PRODUCT SIZES

Table for IWS-sleeves

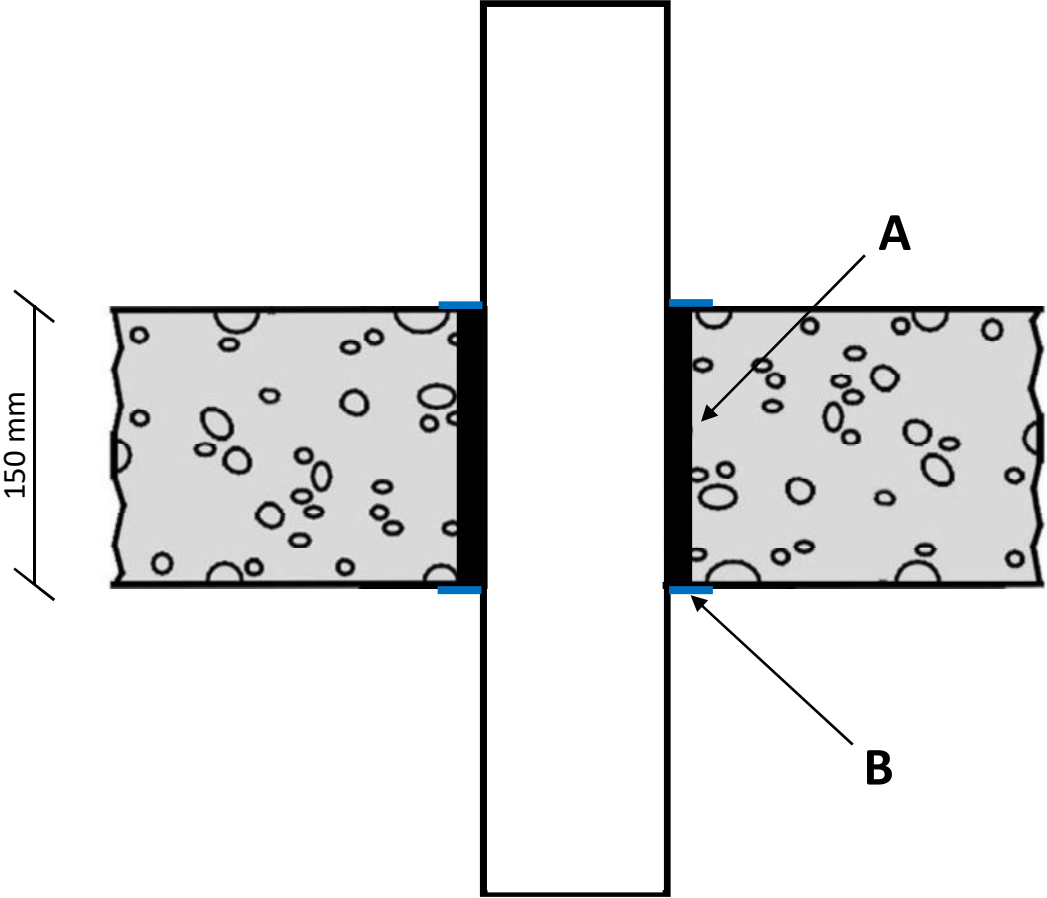
Product	Active intumescent material thickness:	Sponge thickness:	Overall product thickness:	Pipe range diameter:
	[mm]	[mm]	[mm]	[Ø]
IWS 18	2.0mm	none	2.4mm	18-24
IWS 25	2.0mm	none	2.4mm	25-32
IWS 33	3.0mm	none	3.4mm	33-39
IWS 40	3.0mm	none	3.4mm	40-49
IWS 50	4.0mm	none	4.4mm	50-54
IWS 55	4.0mm	none	4.4mm	55-59
IWS 60	4.0mm	none	4.4mm	60-82
IWS 83	5.0mm	none	5.4mm	83-89
IWS 90	6.0mm	none	6.4mm	90-99
IWS 100	6.0mm	none	6.4mm	100-114
IWS 115	8.0mm	none	8.4mm	115

Table for WPCS Collar

Product	Active intumescent material thickness:	Sponge thickness:	Overall product thickness:	Pipe range diameter:
	[mm]	[mm]	[mm]	[Ø]
WPCS 45 Collar	2	none	40 x 45	35-45
WPCS 55 Collar	2	none	40 x 55	46-55
WPCS 65 Collar	2	none	40 x 65	56-65
WPCS 75 Collar	5	none	40 x 75	66-75
WPCS 100 Collar	8	none	40 x 100	76-100

Note:
All AM Mastic seal widths and depths are shown in the test report in Table 2.

Firoblok IWS

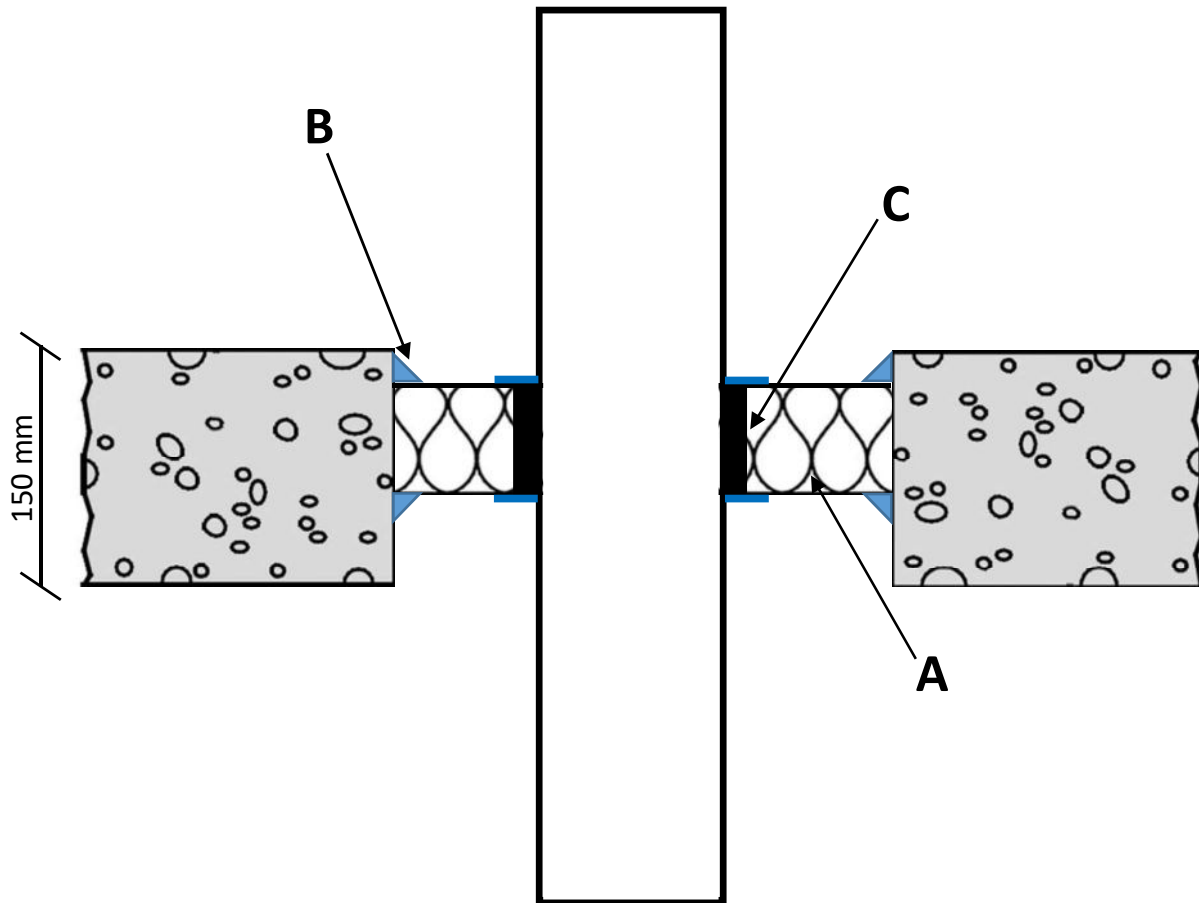


A: Envirograf Product 110 Firoblok IWS

B: Envirograf Product 58 AM Mastic

Plastic pipe installed in intumescent coated slab

Note:
All AM Mastic seal widths and depths are shown in the test report in Table 2.



A: Envirograf Product 4 mineral wool slab

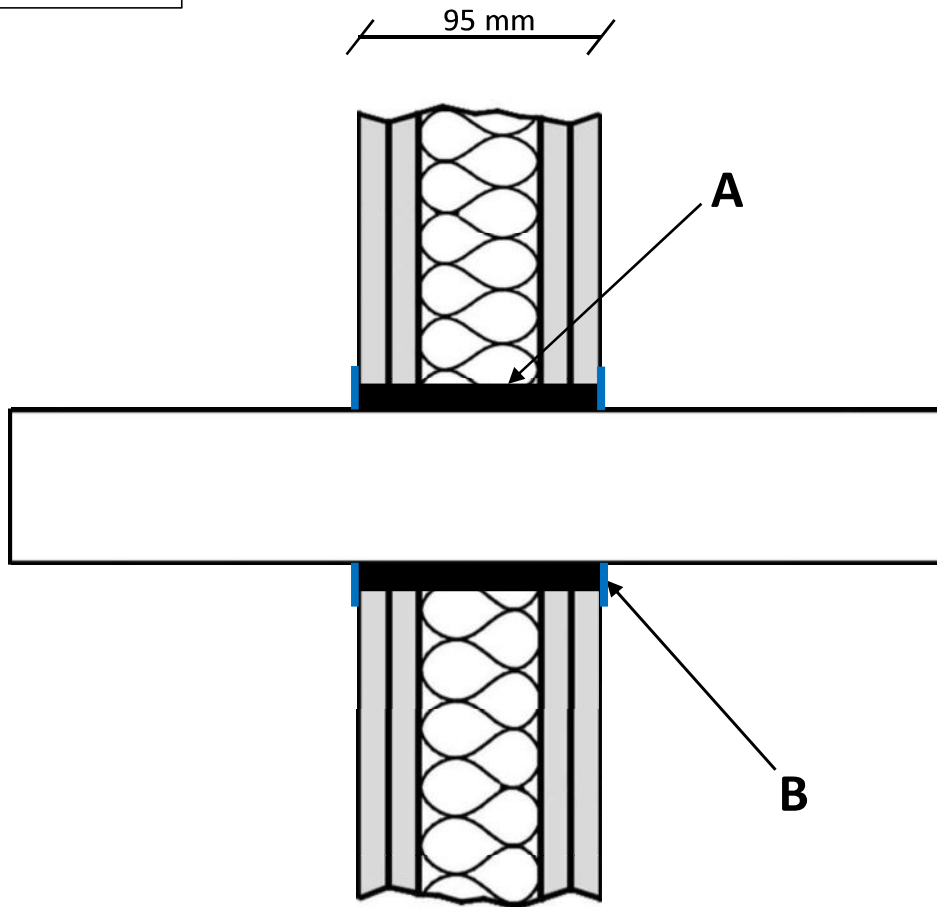
B: Envirograf Product 58 AM Mastic

C: Envirograf Product 110 IWS

IWS – Plastic pipe



Note:
All AM Mastic seal widths and depths are shown in the test report in Table 2.



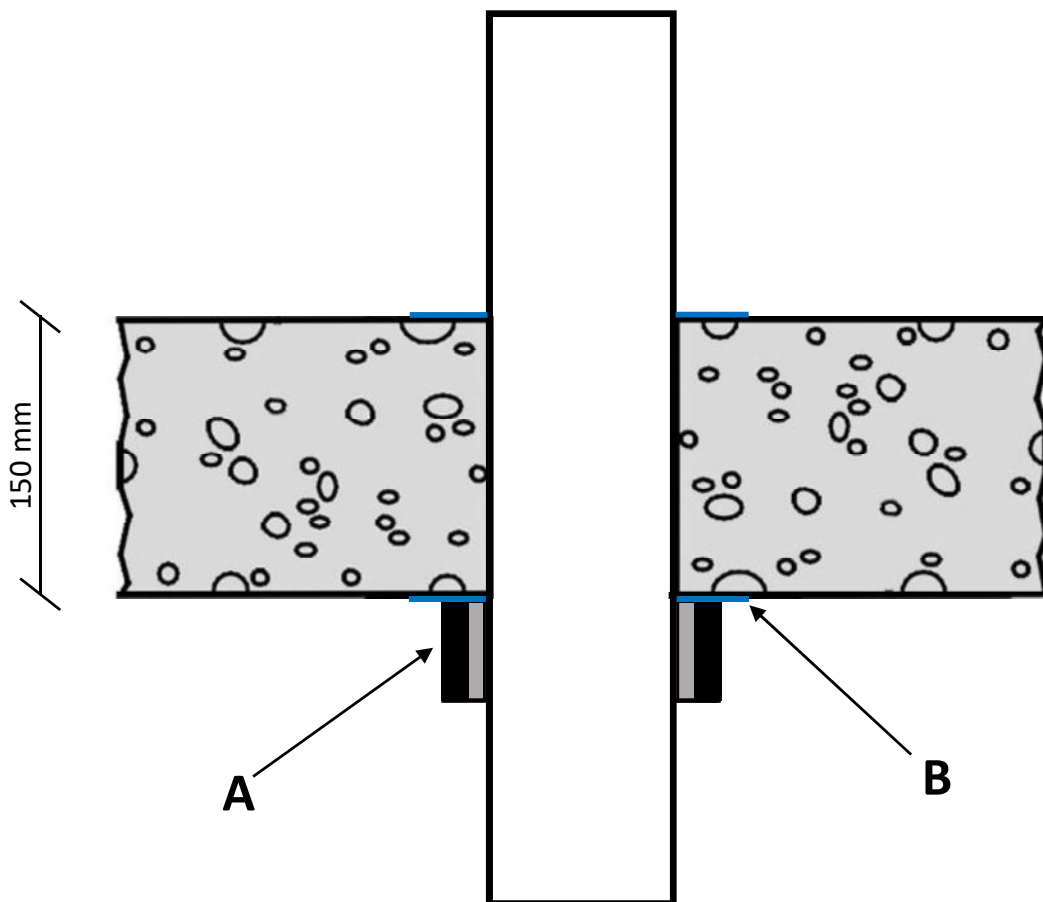
A: Envirograf Product 110 Firoblok (IWS)

B: Envirograf Product 58 AM Mastic

Product 13 Intumescent Collar (WPCS)

Note:

All AM Mastic seal widths and depths are shown in the test report in Table 2.



A: Envirograf Product 13 Intumescent Collar (WPCS)

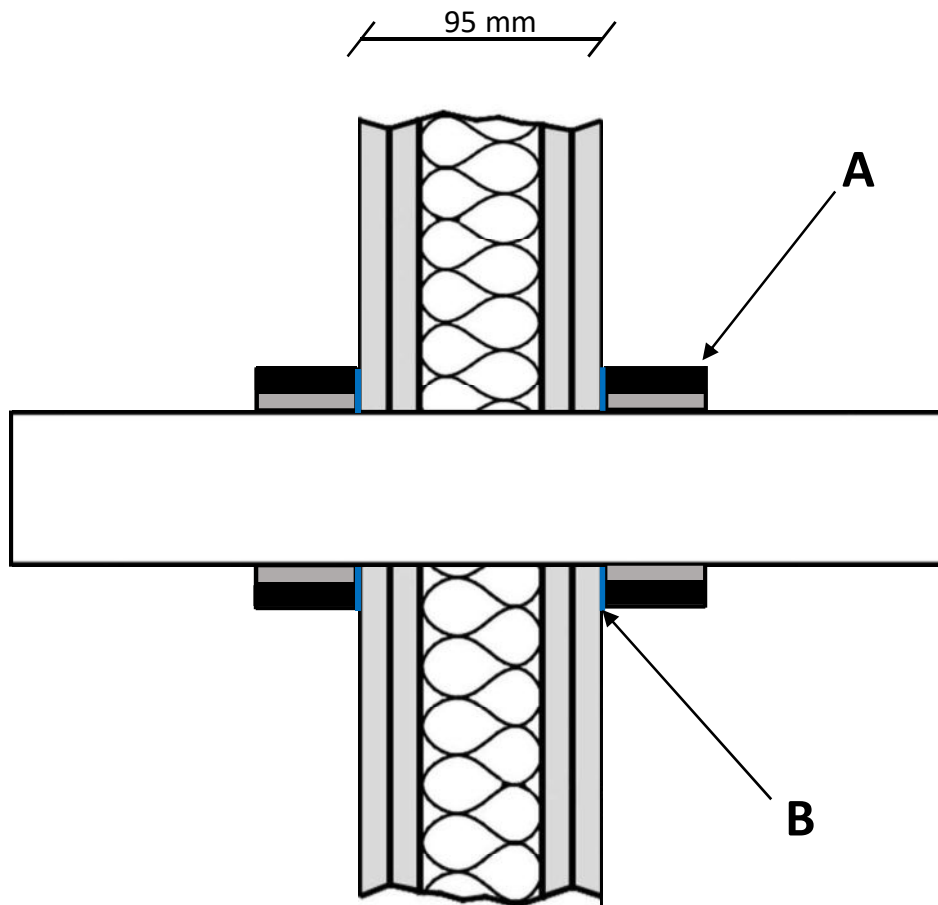
B: Envirograf Product 58 AM Mastic

WPCS Intumescent Collar



Note:

All AM Mastic seal widths and depths are shown in the test report in Table 2.



A: Envirograf WPCS Intumescent Collar

B: Envirograf Product 58 AM Mastic