DBI
FIRE AND SECURITY

CLASSIFICATION REPORT
FIROBLOK IWS/T

Name of sponsor: **Intumescent Systems Ltd and Envirograf Europe**

Product name: FIROBLOK IWS/T, AM mastic P58

File no.: PCA10782C **Revision No:** 0

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TEST Reg.no.0012

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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.

Content

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: Intumescent System Ltd, Envirograf

The products were designated:
Pipes: Cast iron, Steel and Stainless steel.
Sleeve: FIROBLOK IWS/T
Sealant: AM mastic P58

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 device around the pipes is a Firoblok IWS/T 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 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 always 2 mm, but the size of the insulation layer changes due to the size of the device.

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	01-06-2021
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

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

Test results

DBI test reports concerns many different pipe types. For this classification, we look at the two systems described in table A. Layout drawings of the tested systems is 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 575 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 separating elements or aerated concrete)
minimum density 575 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 5 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 AM mastic P58 must be placed sloped from the pipes on both sides to prevent smoke from penetrating the penetration. Sizes of the sealant are descripted in the field of application for the different classifications.
Active component in the sleeve:

The thickness of the active component on the Firoblok IWS/T sleeve is always 2 mm in thickness.
The length of the active component is always the same length as the construction it penetrates.

The following text are 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 – 4.8.

Position of support for the service:
System made from non-combustible material fixing the service at maximum 400 mm from one side of the wall construction and maximum 400 mm away from the upper side of a floor construction. (§13.4.3)

Pipe wall thickness
Maximum pipe wall thickness is 14,2 mm for all pipe diameters. §E.1.2.1

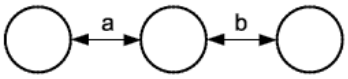
Changes of type of pipe material:
For service of non-combustible pipes, pipe material can be exchanged with other metals with a higher melting point and lower thermal conductivity. The tested materials have the following thermal conductivity and melting point: (§E.1.5.2)

Material	**Thermal conductivity W/m·k**	**Melting point °C**
Copper	386	1084
Cast iron	52	1127
Steel	45	1425
Stainless Steel	14	1510

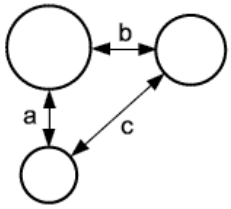
Pipe end configuration for metal pipes (§E.1.5.5)

The classification of U/C is valid for the U/C, C/U and C/C configuration, but not vice versa.
U/C = (Uncapped inside the furnace, capped outside the furnace)
C/U = (Capped inside the furnace, uncapped outside the furnace)
C/C = (capped inside the furnace, Capped outside the furnace)

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 section.



Linear arrangement



Cluster arrangement

Minimum distance between the aperture (drilled hole) for each pipe penetration is:
a ≥ 200 mm
b ≥ 200 mm
c ≥ 200 mm
The gap between the IWS/T device and the supporting construction must be maximum 5 mm.

Extended field of application from EXAP PHB10144A according to EN 15882-3: 2009

Changes in orientation: according to rule A.1.1 Table A.1 (Sealant / Mastics)
Floor seal generally more onerous than wall and may be used as supporting evidence for a wall mounted application.
Test evidence from wall applications shall not be used to support floor applications.

Changes of pipe dimensions: according to rule 4.2 table 4 (Metal pipes)
Permitted between the diameters tested and wall thicknesses tested.

4.4 Classification and field of application - Summary

The product is classified according to the following combinations of performance and classes as appropriate.
Interpolation of any material must be considered together with enclosure: Table of Envirograf product sizes.
Type of supporting construction is shown in section 4.2 and on each pipe classification chapter.

Material	Pipe Diameter	Pipe wall thickness	Product active component	Product internal insulation	Floor / Wall	Classification
Stainless steel	10mm - 33,5mm	1mm - 14,2mm	2mm	10mm	Floor & Wall	EI 120 C/C
	10mm - 75mm	1mm - 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 90 C/C
	10mm - 110mm	1mm - 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 60 C/C
Steel	17,5mm - 33,5mm	2,4 mm - 14,2mm	2mm	10mm	Floor & Wall	EI 120 C/C
	17,5mm - 75mm	2,4 mm - 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 90 C/C
	17,5mm - 110mm	2,4 mm - 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 60 C/C
Cast Iron	75mm	4mm – 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 90 C/C
	75mm - 110mm	4mm - 14,2mm	2mm	10mm - 15mm	Floor & Wall	EI 60 C/C

4.5 Classification and field of application - 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.
For wall constructions, the classification is valid for fire resistance from either side. This is only valid for penetrations through rigid walls (concrete, masonry separating elements or aerated concrete). See section 4.2 – supporting 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 Envirograf product sizes.

Pipes:

For vertical penetrations through deck constructions:
Steel pipes with pipe diameter of Ø17,5 to Ø33,5 mm and with a wall thickness of 2,4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A1
Stainless steel pipes with pipe diameter of Ø10 to Ø33,5 mm and with a wall thickness of 1 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A2.

For horizontal penetrations through wall constructions:
Steel pipes with pipe diameter of Ø17,5 to Ø33,5 mm and with a wall thickness of 2,4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A1.
Stainless steel pipes with pipe diameter of Ø10 to Ø33,5 mm and with a wall thickness of 1 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A2.

Sealant:
AM mastic P58 must be placed sloped around the pipes on both sides of the construction.
Width: 50 mm.
Depth: 4 mm.

Insulation:
The internal insulation in the Firoblok IWS/T sleeve must be 10 mm.

4.6 Classification and field of application - EI 90 C/C.

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

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

For deck constructions the classification is only valid with fire from below.
For wall constructions, the classification is valid for fire resistance from either side. This is only valid for penetrations through rigid walls (concrete, masonry separating elements or aerated concrete). See section 4.2 – supporting 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:

For vertical penetrations through deck constructions:
Cast iron pipes with pipe diameter of Ø75 mm and with a wall thickness of 4 - 14,2 mm.
Steel pipes with pipe diameter of Ø17,5 to Ø75 mm and with a wall thickness of 2,4 - 14,2 mm.
Pipe interpolation and wall thicknesses are shown in Annex A3.
Stainless steel pipes with pipe diameter of Ø10 to Ø75 mm and with a wall thickness of 1 - 14,2 mm.
Pipe interpolation and wall thicknesses are shown in Annex A4.

For horizontal penetrations through wall constructions:
Cast iron pipes with pipe diameter of Ø75 mm and with a wall thickness of 4 - 14,2 mm.
Steel pipes with pipe diameter of Ø17,5 to Ø75 mm and with a wall thickness of 2,4 - 14,2 mm.
Pipe interpolation and wall thicknesses are shown in Annex A3.
Stainless steel pipes with pipe diameter of Ø10 to Ø75 mm and with a wall thickness of 1 - 14,2 mm.
Pipe interpolation and wall thicknesses are shown in Annex A4.

*Note: Steel and stainless-steel pipe diameter Ø33.5 mm with a wall thickness of 3.25 mm can be installed in a flexible wall as shown in 4.2 – supporting constructions.

Sealant:

AM mastic P58 must be placed sloped around the pipes on both sides of the construction.
Width: 50 mm.
Depth: 4 mm.

Insulation:

The internal insulation in the Firoblok IWS/T sleeve on pipe Ø10 – up to Ø50 must be 10 mm.
The internal insulation in the Firoblok IWS/T sleeve on pipe Ø50 - Ø75 must be 15 mm.

4.7 Classification and field of application - 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 deck constructions the classification is only valid with fire from below.
For wall constructions, the classification is valid for fire resistance from either side. This is only valid for penetrations through rigid walls (concrete, masonry separating elements or aerated concrete). See section 4.2 – supporting 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 Envirograf product sizes.

Pipes:

For vertical penetrations through deck constructions:
Cast iron pipes with pipe diameter of Ø75 mm to Ø110 mm and with a wall thickness of 4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A5.
Steel pipes with pipe diameter of Ø17,5 to Ø110 mm and with a wall thickness of 2,4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A6.
Stainless steel pipes with pipe diameter of Ø10 to Ø110 mm and with a wall thickness of 1 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A7.

For horizontal penetrations through wall constructions:
Cast iron pipes with pipe diameter of Ø75 mm to Ø110 mm and with a wall thickness of 4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A5.
Steel pipes with pipe diameter of Ø17,5 to Ø110 mm and with a wall thickness of 2,4 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A6.
Stainless steel pipes with pipe diameter of Ø10 to Ø110 mm and with a wall thickness of 1 - 14,2 mm
Pipe interpolation and wall thicknesses are shown in Annex A7.

*Note: Steel and stainless-steel pipe diameter Ø33.5 mm with a wall thickness of 3.25 mm can be installed in a flexible wall as shown in 4.2 – supporting constructions.

Sealant:

AM mastic P58 must be placed sloped around the pipes on both sides of the construction.
Width: 50 mm.
Depth: 4 mm.

Insulation:

The internal insulation in the Firoblok IWS/T sleeve on pipe Ø10 – up to Ø50 must be 10 mm
The internal insulation in the Firoblok IWS/T sleeve on pipe Ø50 - Ø75 must be 15 mm.

5. 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 2	Stainless steel	10	PGA12059A	E 120 C/C	EI 120 C/C
Seal 3	Steel	17.5	PGA12059A	E 120 C/C	EI 120 C/C
Seal 8	Steel	33.5	PGA11952A	E 120 C/C	EI 120 C/C
Seal 9	Cast iron	75	PGA11952A	E 120 C/C	EI 90 C/C
Seal 10	Cast iron	110	PGA11952A	E 120 C/C	EI 60 C/C
Seal 8	Steel	33.5	PGA11952B	E 120 C/C	EI 90 C/C

6. Limitations

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

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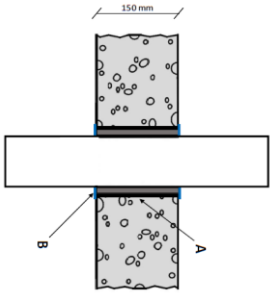
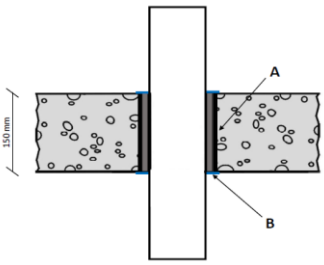
Denmark

EI 120 C/C Vertical and horizontal Pipe penetration

Steel - Pipes

Pipe Sleeve IWS/T

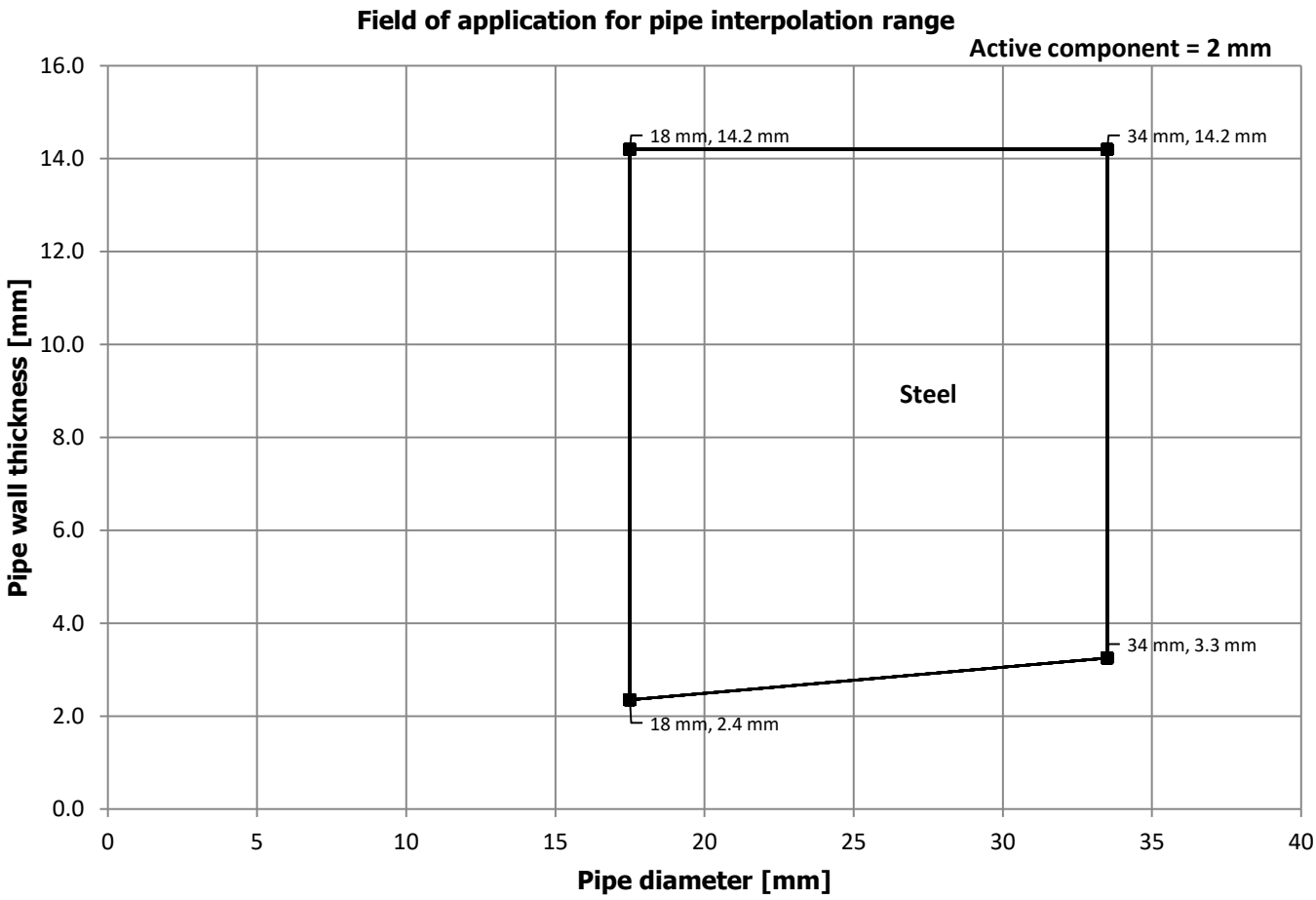




No.	Item	Description
1	Pipe	Steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

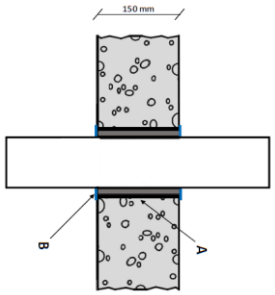
B: Envirograf Product 58 AM Mastic

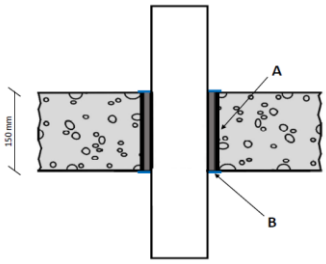


EI 120 C/C Vertical and horizontal Pipe penetration

Stainless steel - Pipes

Pipe Sleeve IWS/T

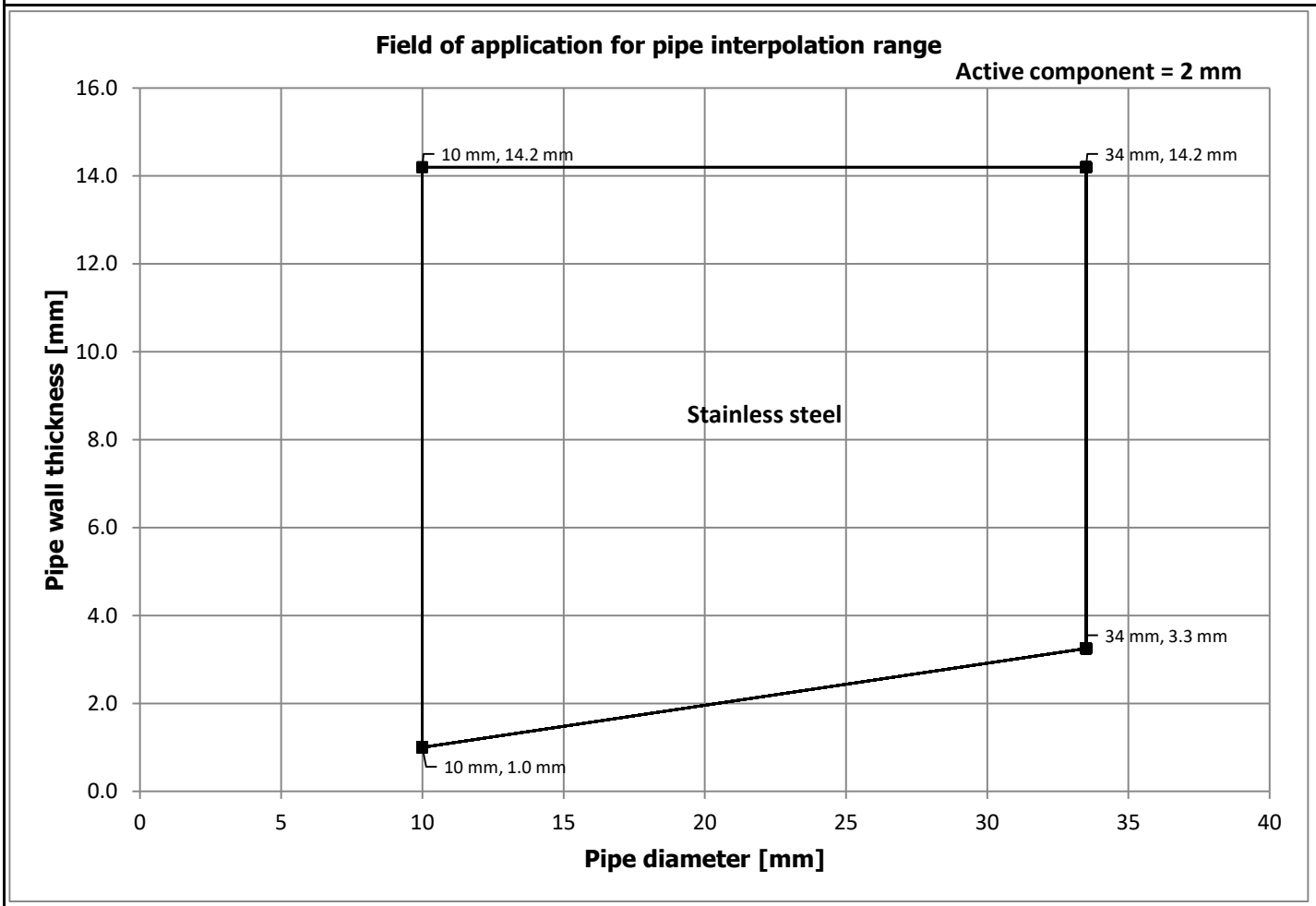




No.	Item	Description
1	Pipe	Stainless steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

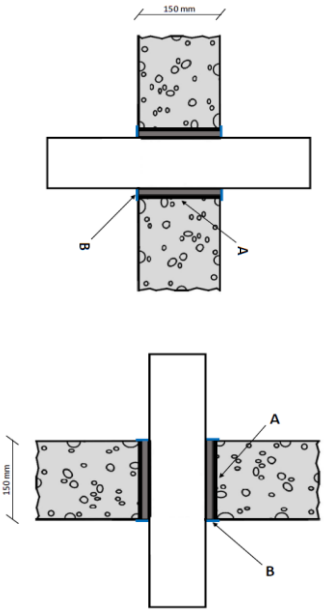
B: Envirograf Product 58 AM Mastic



EI 90 C/C Vertical and horizontal Pipe penetration

Steel - Pipes

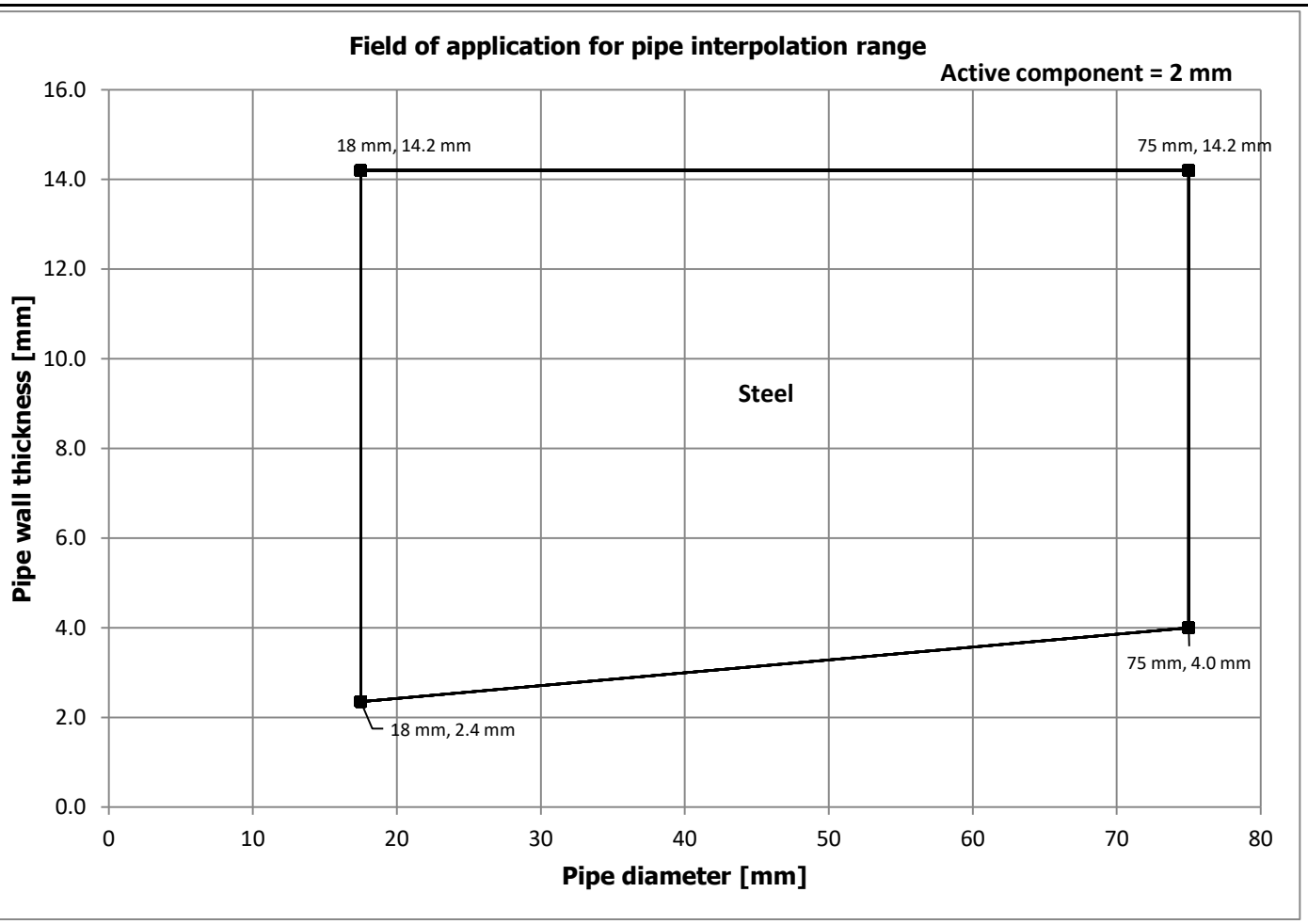
Pipe Sleeve IWS/T



No.	Item	Description
1	Pipe	Steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

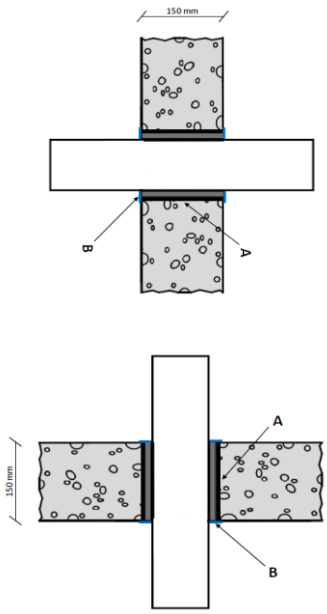
B: Envirograf Product 58 AM Mastic



EI 90 C/C Vertical and horizontal Pipe penetration

Stainless steel - Pipes

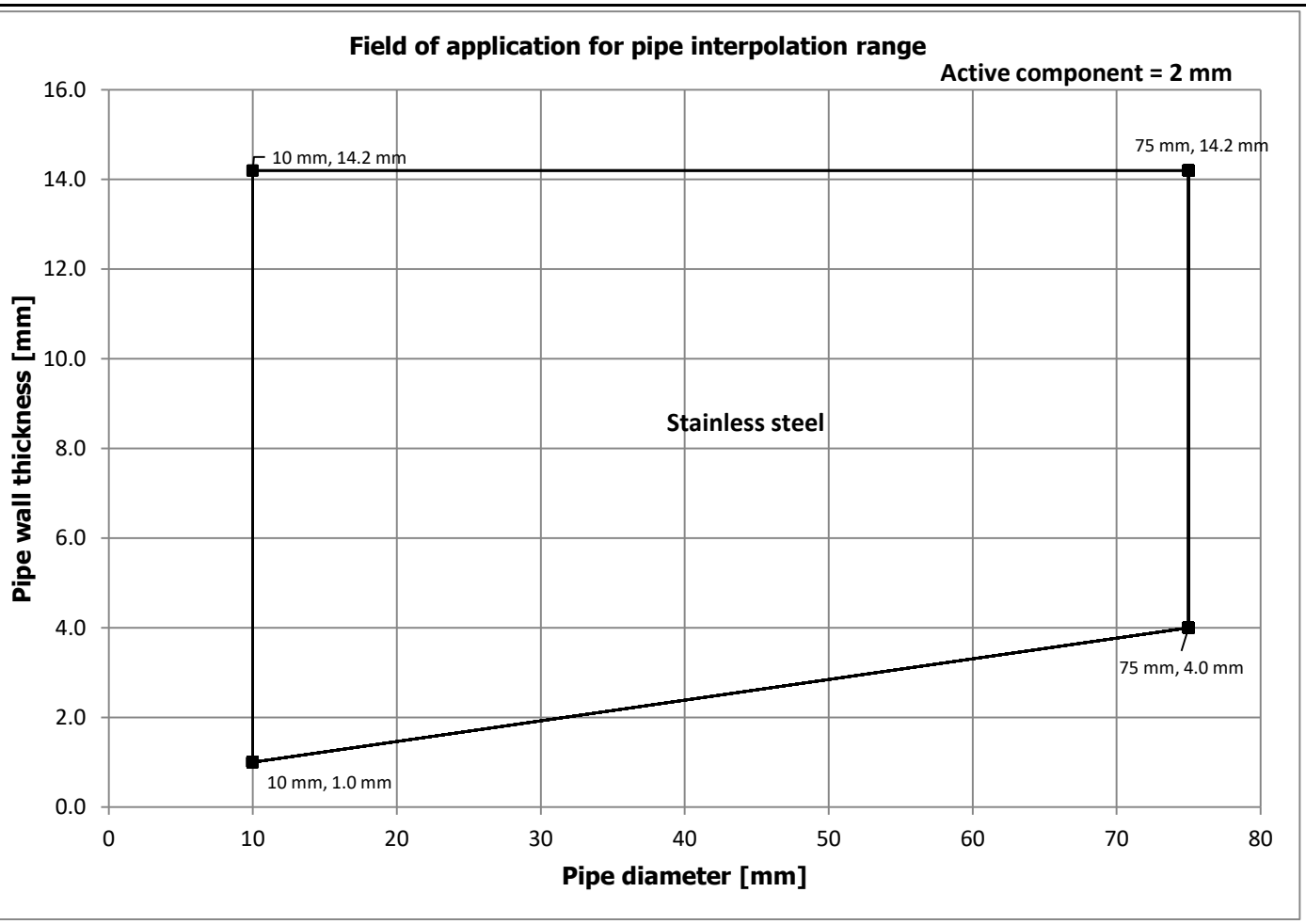
Pipe Sleeve IWS/T



No.	Item	Description
1	Pipe	Stainless steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

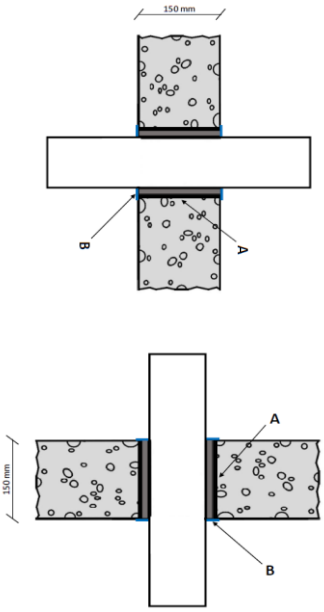
B: Envirograf Product 58 AM Mastic



EI 60 C/C Vertical and horizontal Pipe penetration

Cast iron

Pipe Sleeve IWS/T



No.	Item	Description
1	Pipe	Cast iron
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

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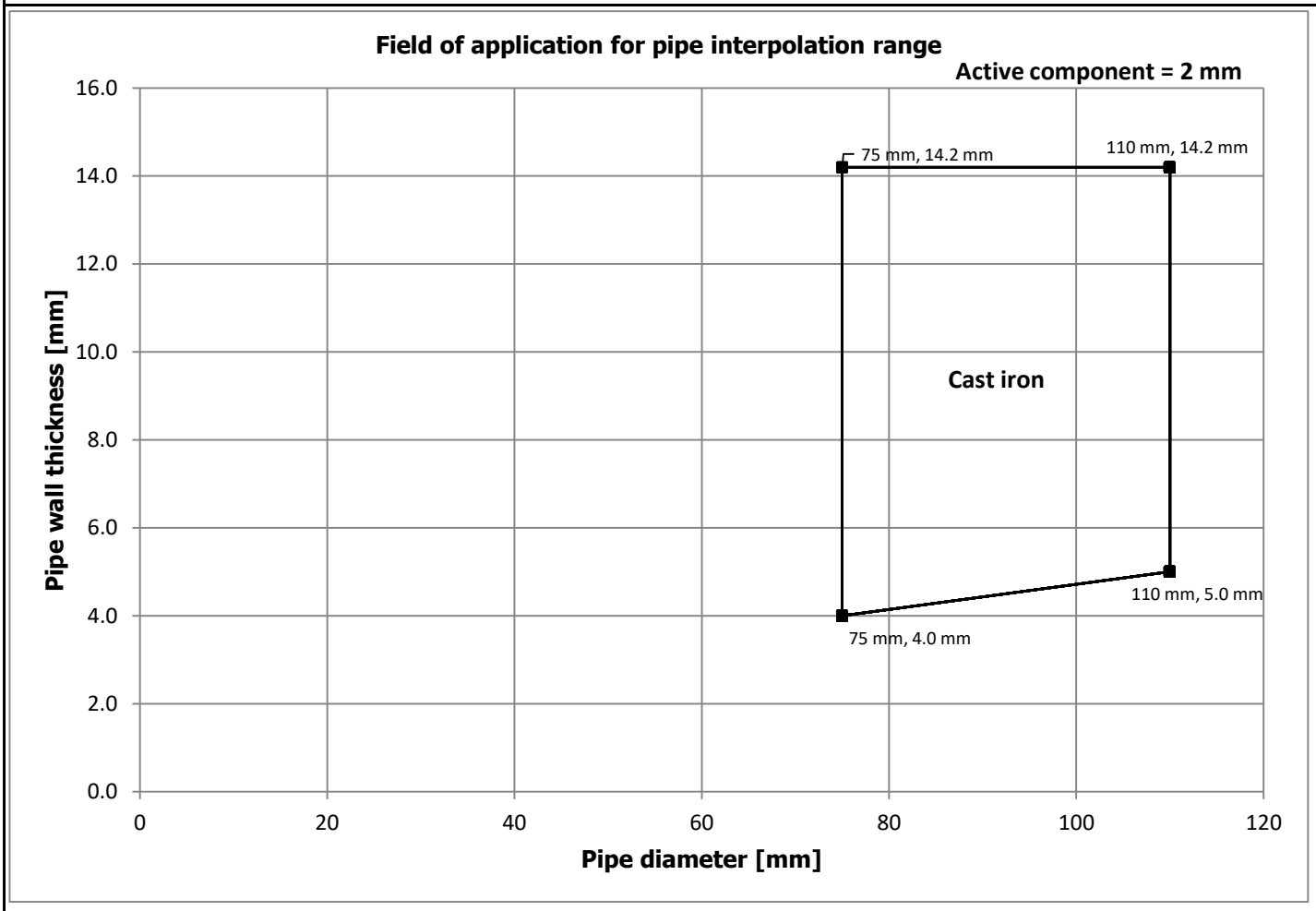
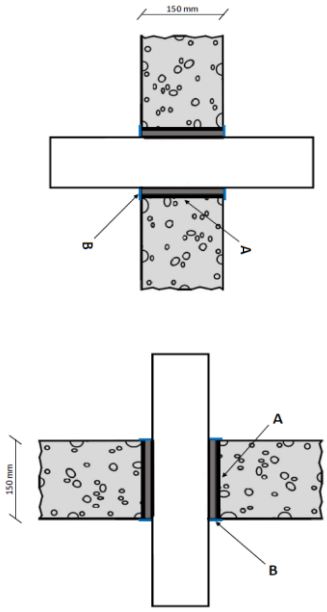


EI 60 C/C Vertical and horizontal Pipe penetration

Steel

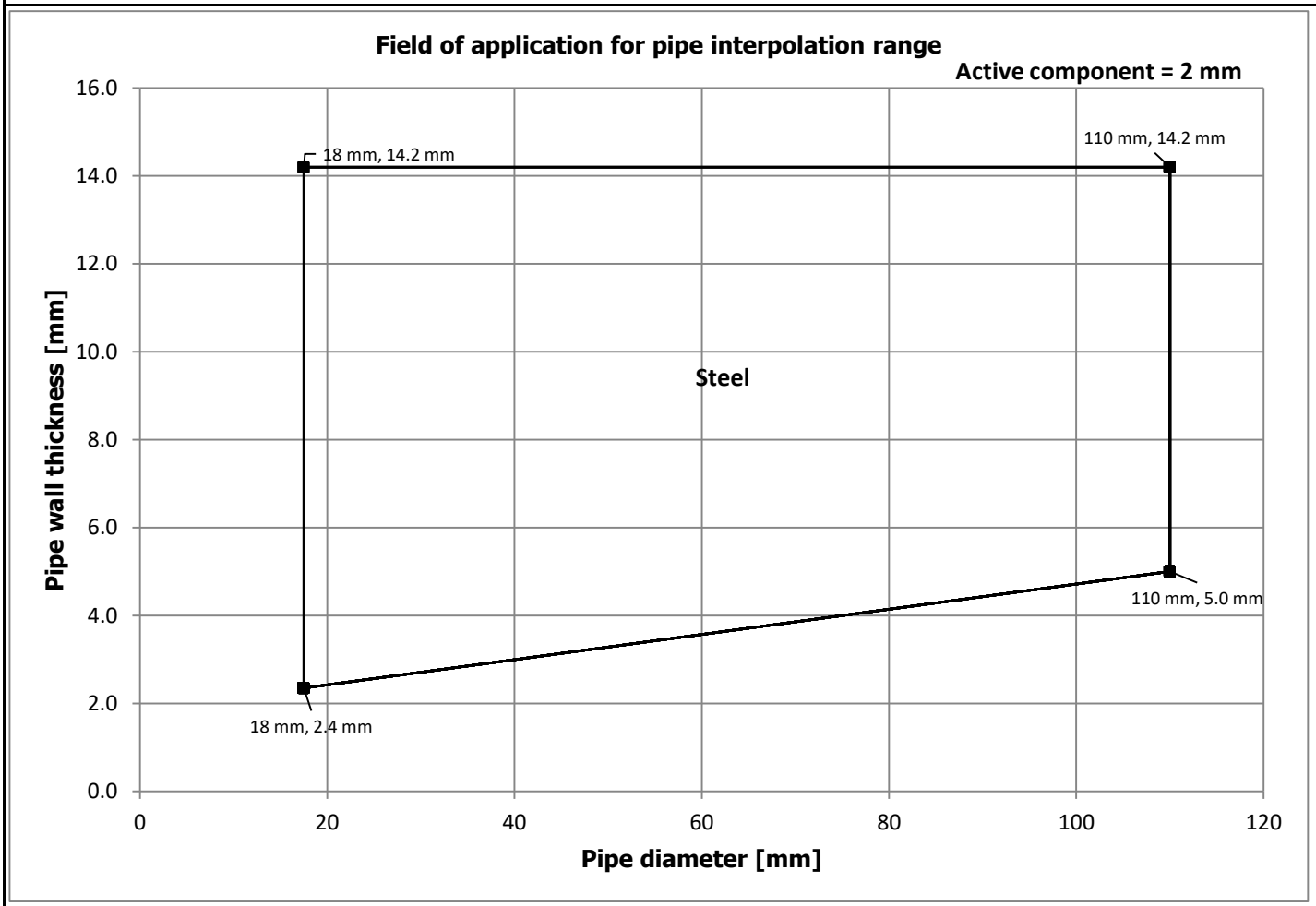
Pipe Sleeve IWS/T



No.	Item	Description
1	Pipe	Steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

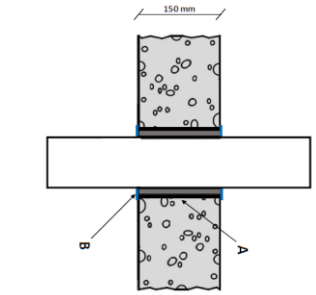
B: Envirograf Product 58 AM Mastic

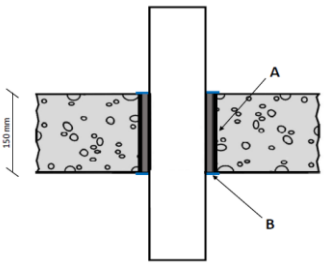


EI 60 C/C Vertical and horizontal Pipe penetration

Stainless Steel

Pipe Sleeve IWS/T

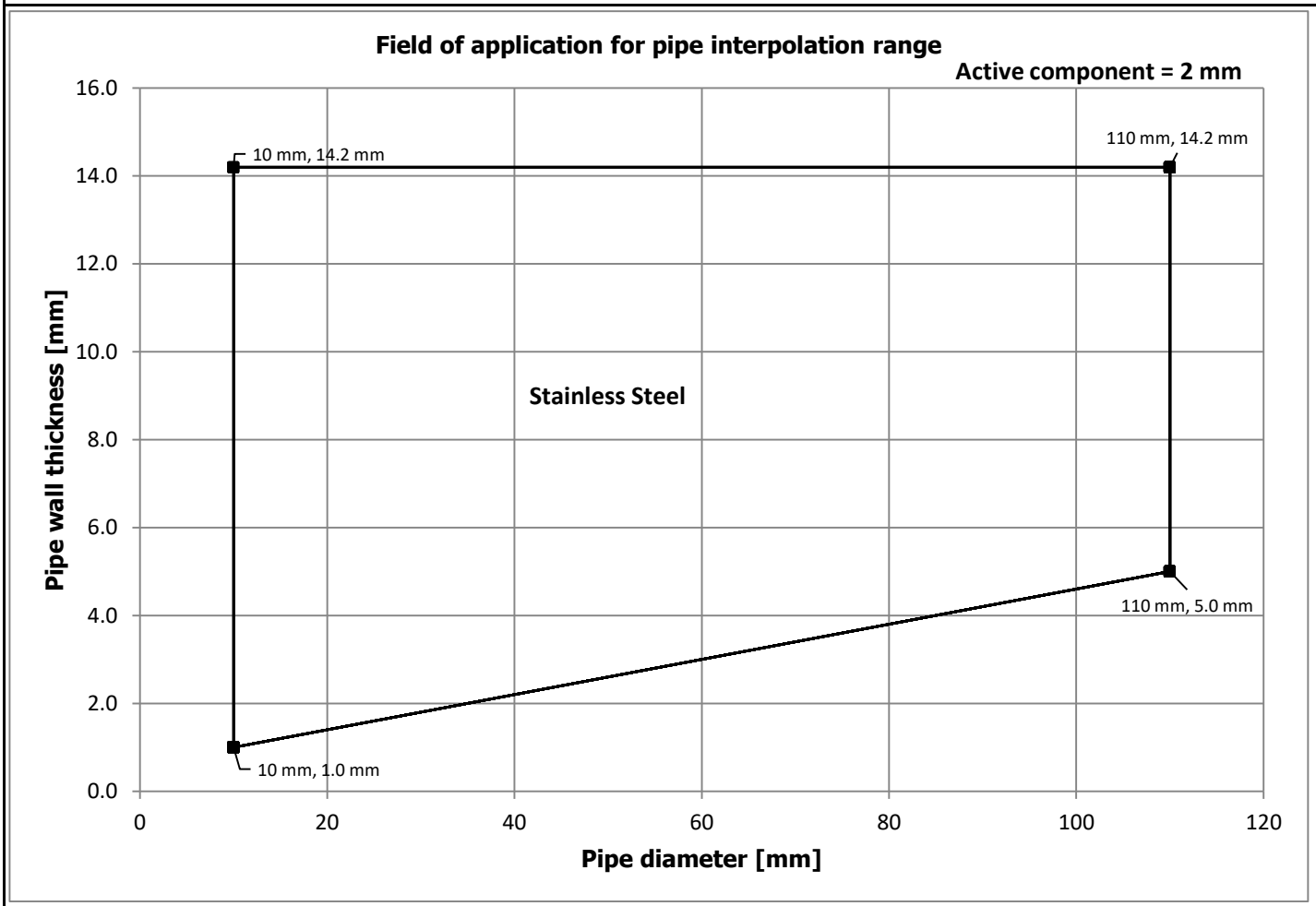




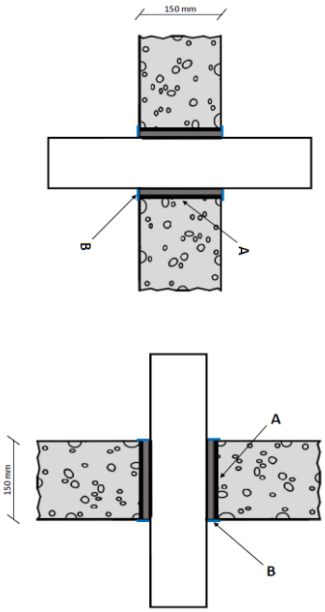
No.	Item	Description
1	Pipe	Stainless Steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

B: Envirograf Product 58 AM Mastic



EI 60 C/C Vertical and horizontal Pipe penetration
Cast iron / Steel / Stainless Steel
Pipe Sleeve IWS/T



No.	Item	Description
1	Pipe	Cast iron / Steel / Stainless Steel
2	Sleeve	IWS/T
3	Deck / Wall	Aerated concrete, Concrete or Masonry
4	Service support	Metal hanger

A: Envirograf Product 110 IWS/T Firoblok

B: Envirograf Product 58 AM Mastic

Pipe interpolation - Cast Iron

Pipe interpolation - Steel

Pipe interpolation - Stainless Steel

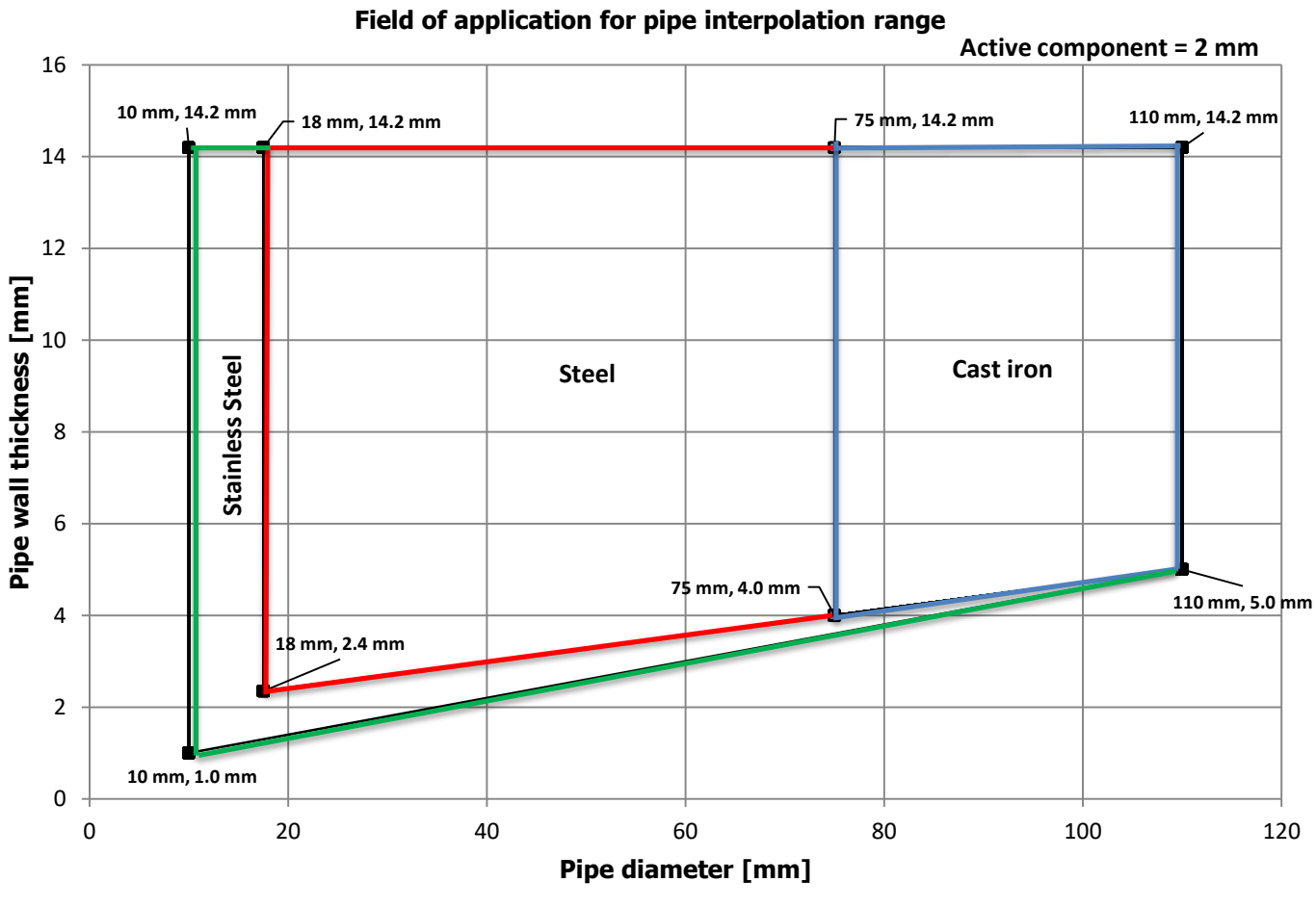


TABLE OF ENVIROGRAF PRODUCT SIZES

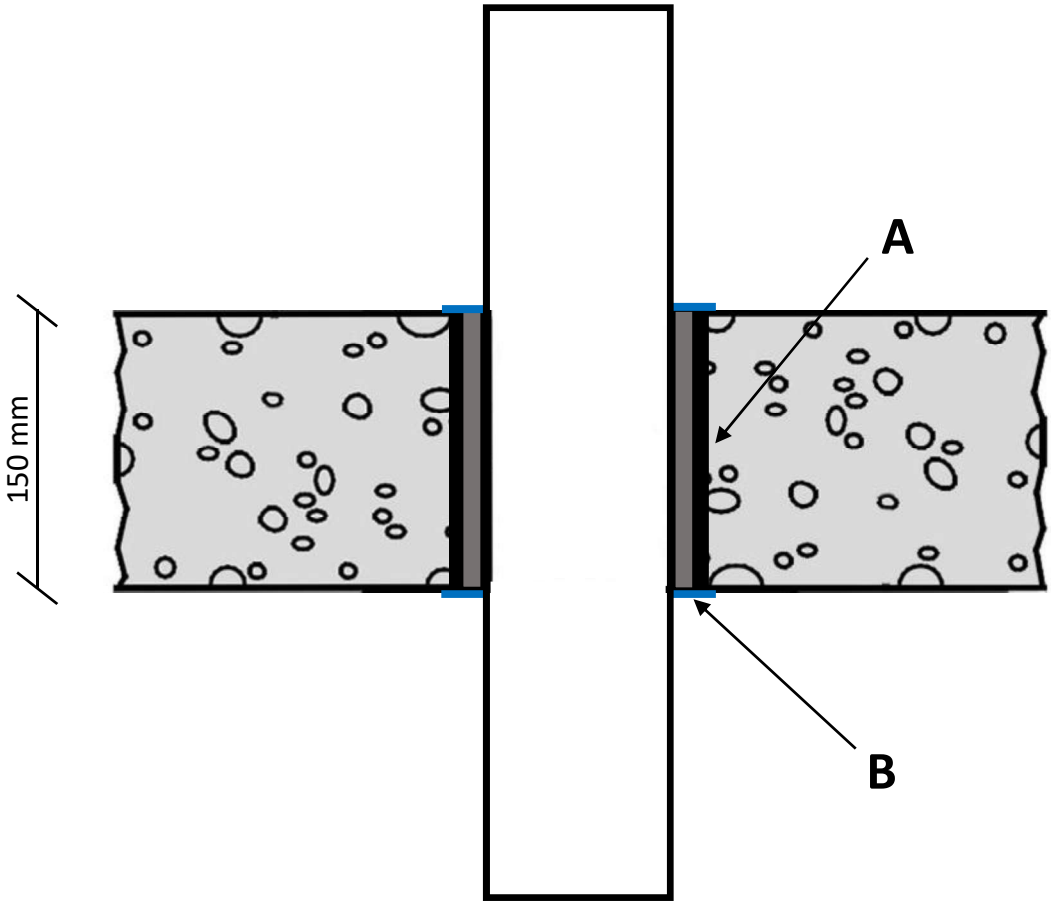
Table for IWS/T-sleeves

Product	Active intumescent material thickness:	Sponge thickness:	Overall product thickness:	Pipe range diameter:
	[mm]	[mm]	[mm]	[Ø]
IWS 18T	2.0mm	10.0mm	12.4mm	18-24
IWS 25T	2.0mm	10.0mm	12.4mm	25-32
IWS 33T	2.0mm	10.0mm	12.4mm	33-39
IWS 40T	2.0mm	10.0mm	12.4mm	40-49
IWS 50T	2.0mm	15.0mm	17.4mm	50-54
IWS 55T	2.0mm	15.0mm	17.4mm	55-59
IWS 60T	2.0mm	15.0mm	17.4mm	60-82
IWS 83T	2.0mm	15.0mm	17.4mm	83-89
IWS 90T	2.0mm	15.0mm	17.4mm	90-99
IWS 100T	2.0mm	15.0mm	17.4mm	100-114
IWS 115T	2.0mm	15.0mm	17.4mm	115

Product 110 IWS/T Firoblok – Metal pipe

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

DBI
PCA10782C
Christian Basbøll



A: Envirograf Product 110 IWS/T Firoblok

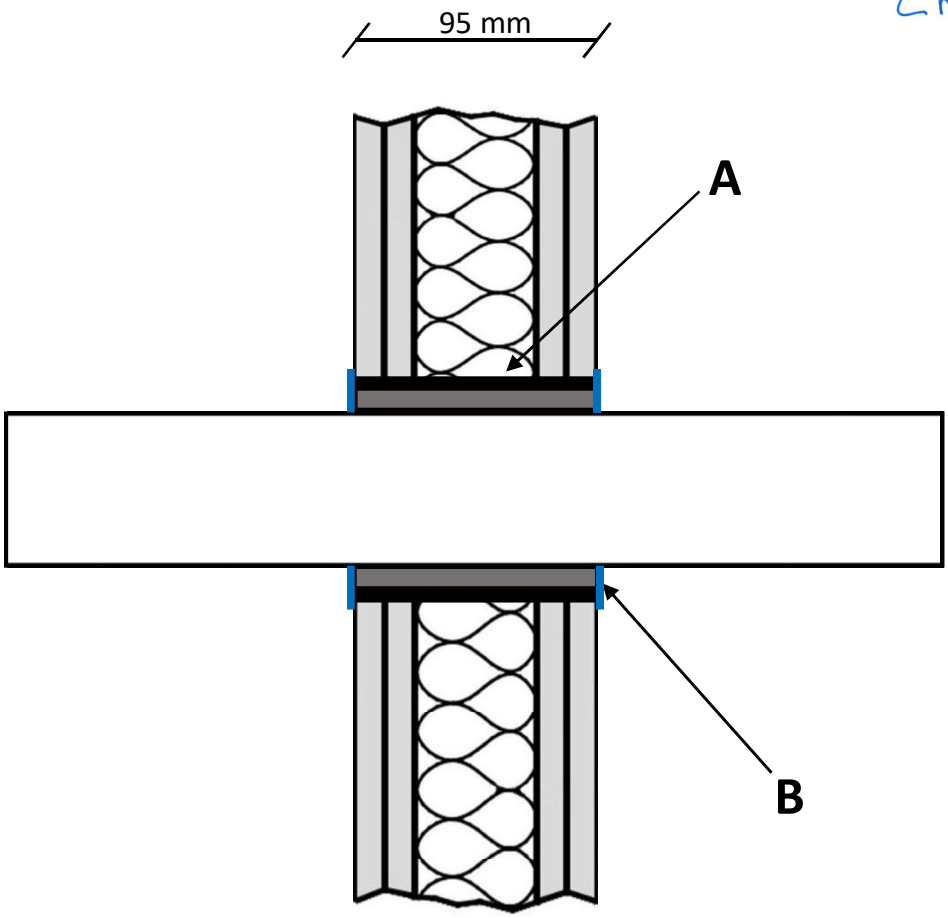
B: Envirograf Product 58 AM Mastic

Drawing no: 8 ***Drawing Date: 30-06-2022***

Product 110 IWS/T Firoblok – Metal pipe

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

DBI
PCA10782C
Christian Basbaum



A: Envirograf Product 110 IWS/T Firoblok

B: Envirograf Product 58 AM Mastic

Drawing no: 5 ***Drawing Date: 30-06-2022***