



Classification Report

Pipe penetration seals

Name of sponsor: SAINT-GOBAIN ISOVER G+H AG

Product name: U Protect Pipe Section Alu2 and U Protect Roll 3.1 Alu1 on metal pipes

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Client information

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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	4
2	Details of classified product	4
	General	4
	Product description	5
3	Reports in support of the classification.....	6
	Test report	6
4	Classification and field of application.....	7
	Reference.....	7
	Classification	7
	Field of application	9
5	Limitations.....	10

1 Introduction

This classification report defines the classification assigned to the product in accordance with the procedures given in DS/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: SAINT-GOBAIN ISOVER G+H AG

The products were designated: U Protect Pipe Section Alu2 and U Protect Roll 3.1 Alu1

The classification is valid for the following end use application: Sealing of metal pipe penetrations in fire compartmentation walls and floors with the configurations EI 30-C/U, EI 30-C/C, EI 90-C/U, EI 90-C/C, EI 120-C/U and EI 120-C/C. The insulation is sustained or interrupted through the penetration and can be either local or continued in the length.

Note:

The letters C/U in the classification refers to how the ends of the pipes were closed during the fire tests. C/U means capped inside the furnace and Uncapped Outside the furnace.

In EN 1366-3:2009 Annex H, the explanation of the closing of the pipes is explained as follows:

Metal pipes would normally be capped inside the furnace as they would not be expected to result in an open end situation in a fire scenario due to their high melting point. However, this depends on the supporting system staying in place. If this is a possibility, consideration can be given to an open ended scenario as shown in Table H.2.

Table H.2 – Metal pipe end configuration versus intended use

Use of pipe	Pipe-end condition	
	Inside the furnace	Outside the furnace
Supported by fire rated ^a suspension	Capped	Uncapped
Supported by non fire rated suspension	Uncapped	Capped
Waste disposal shafts made from pipes	Uncapped	Capped
^a Shown by test or calculation (e.g. Eurocodes)		

Product description

The product is a penetration seal system for non-combustible metal pipe services installed in vertical and horizontal direction, penetrating rigid and flexible walls and rigid floors.

Standard solution:

Drawings of the penetration system are shown on the attached Annexes

Penetration service

Pipes: Non combustible metal pipes, typically copper, steel, stainless steel or cast iron pipes.
Diameter range 8 mm – 219 mm

Pipe suspension system

Hangers: System made from non-combustible material fixing the service at maximum 600 mm from both sides of the wall construction and maximum 600 mm away from the upper side of a floor construction.

Cladding

Insulation:

Type 1:
U Protect Pipe Section Alu2
Resin-bonded mineral wool with a reinforced aluminium foil
EC Certificate of Conformity no. 0751-CPR.2-003.0-04
Thickness range from 20 mm to 139 mm
Nominal density range of 62 kg/m³ to 90 kg/m³
Reaction to fire classification A2_L-s1,d0

The variations in the application of the insulation (e.g. thickness and length) are shown in Annexes V01A to H05A.

The minimum insulation length is measured from the center of the penetration, unless otherwise specified.

Type 2:
U Protect Roll 3.1 Alu1
Resin-bonded mineral wool with a reinforced aluminium foil
EC Certificate of Conformity no. 0751-CPR.2-003.0-07
Nominal density range of 34 kg/m³
Reaction to fire classification A1

The variations in the application of the insulation (e.g. thickness and length) are shown in Annexes V11A to H12A.

The minimum insulation length is measured from the center of the penetration, unless otherwise specified.

Fixing: The insulation is wrapped around the pipes with a longitudinal butt-joint.
The alu-foil overlaps the joint with minimum 30 mm and is fixed using minimum 10 -20 mm wide self-adhesive tape.

Steel wires
with minimum thickness of 0.6 mm are used to maintain the insulation in position. The

steel wires are positioned with a distance c/c of maximum 250 mm starting maximum 75 mm from the supporting construction or a lateral joint in the insulation.

Or

Steel band

Minimum dimensions w x t = 16 mm x 0.4 mm. The band and clamps are positioned with a distance c/c of maximum 250 mm starting maximum 75 mm from the supporting construction or a lateral joint in the insulation.

Penetration

Aperture: The distance from the surface of the pipe and the supporting construction shall be between 10 mm - 50 mm.

Sealing material: The aperture in floors and rigid walls can be filled with: mortar or concrete.

The aperture in flexible walls can be filled with: gypsum plaster/render/filler.

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
MPA Braunschweig	SAINT-GOBAIN ISOVER G+H AG	2401/156/16 dated 08-08-2016	EN 1366-3:2009	14-12-2011
MPA Braunschweig	SAINT-GOBAIN ISOVER G+H AG	2401/168/16 dated 08-08-2016	EN 1366-3:2009	04-05-2012
MPA Braunschweig	SAINT-GOBAIN ISOVER G+H AG	2401/157/16 dated 08-08-2016	EN 1366-3:2009	28-03-2012
MPA Braunschweig	SAINT-GOBAIN ISOVER G+H AG	2401/169/16 dated 08-08-2016	EN 1366-3:2009	05-09-2012
DBI- Danish Institute of Fire and Security Technology	SAINT-GOBAIN ISOVER G+H AG	PGA11089A dated 22-12-2017	EN 1366-3:2009	17-10-2017

4 Classification and field of application

Reference

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

Classification

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

Fire resistance classification: **EI 30-C/U, EI 90-C/U and EI 120-C/U**

For specification of the classification of each specific seal configuration, see enclosures listed below.

Annexes for U Protect Pipe Section Alu2

Annex	Classification	Orientation	Length of insulation	Pipe material	Insulation
V01A	EI 120	Vertical pipes	1200 mm	All pipes as specified below	LS
V01B	EI 120	Vertical pipes	1200 mm	Stainless steel	LS
V01C	EI 120	Vertical pipes, Cluster	1200 mm	All pipes as specified below	LS & CS
V01D	EI 120	Vertical pipes	600 mm	All pipes as specified below	LS
V01E	EI 120	Vertical pipes	600 mm	All pipes as specified below	LI
V01F	EI 120	Vertical pipes	1200 mm asymmetrical	All pipes as specified below	LS
V02A	EI 120	Vertical pipes	Continued	All pipes as specified below	CS
V02B	EI 120	Vertical pipes	Continued	Stainless steel	CS
V02C	EI 120	Vertical pipes	Continued	All pipes as specified below	CI
V02D	EI 120	Vertical pipes	Continued asymmetrical	All pipes as specified below	CS
V03A	EI 90	Vertical pipes	1200 mm	All pipes as specified below	LS
V03B	EI 90	Vertical pipes	1200 mm	Stainless steel	LS
V03C	EI 90	Vertical pipes, Cluster	1200 mm	All pipes as specified below	LS & CS
V03D	EI 90	Vertical pipes, Cluster	1200 mm	Stainless steel	LS & CS
V04A	EI 90	Vertical pipes	Continued	All pipes as specified below	CS
V04B	EI 90	Vertical pipes	Continued	Stainless steel	CS
H01A	EI 120	Horizontal pipes	1200 mm	All pipes as specified below	LS
H02A	EI 120	Horizontal pipes	Continued	All pipes as specified below	CS
H03A	EI 90	Horizontal pipes	1200 mm	All pipes as specified below	LS

H03B	EI 90	Horizontal pipes	1200 mm	Steel, Stainless steel	LS
H03C	EI 90	Horizontal pipes	1200 mm	Stainless steel	LS
H03D	EI 90	Horizontal pipes	1200 mm	All pipes as specified below	LI
H03E	EI 90	Horizontal pipes Cluster	1200 mm	All pipes as specified below	LS & CS
H03F	EI 90	Horizontal pipes Cluster	1200 mm	Steel, Stainless steel	LS & CS
H03G	EI 90	Horizontal pipes Cluster	1200 mm	Stainless steel	LS & CS
H04A	EI 90	Horizontal pipes	Continued	All pipes as specified below	CS
H04B	EI 90	Horizontal pipes	Continued	Steel, Stainless steel	CS
H04C	EI 90	Horizontal pipes	Continued	All pipes as specified below	CI
H05A	EI 30	Horizontal pipes	1200 mm asymmetrical	All pipes as specified below	LS & CS

Annexes for U Protect Roll 3.1 Alu1

Annex	Classification	Orientation	Length of insulation	Pipe material	Insulation
V11A	EI 120	Vertical pipes	1200 mm	All pipes as specified below	LS
V12A	EI 120	Vertical pipes	Continued	All pipes as specified below	CS
V13A	EI 90	Vertical pipes	Continued	All pipes as specified below	LS
V13B	EI 90	Vertical pipes	1200 mm	Stainless steel	LS
V14A	EI 90	Vertical pipes	Continued	All pipes as specified below	CS
V14B	EI 90	Vertical pipes	Continued	Stainless steel	CS
H11A	EI 90	Horizontal pipes	1200 mm	All pipes as specified below	LS
H12A	EI 90	Horizontal pipes	Continued	All pipes as specified below	CS

Explanations:

LS	=	Local, Sustained insulation
LI	=	Local, Interrupted insulation
CS	=	Continued, Sustained insulation
CI	=	Continued, Interrupted insulation

Field of application

This classification is valid for the following end use applications:

Orientation of penetration:

For protection of vertical and horizontal pipe penetrations.

Supporting construction:

For penetration through rigid floors (concrete, masonry or aerated concrete)

minimum density 475 kg/m³ (§13.2.1)

minimum thickness of 150 mm. (§13.2.1)

For penetration through rigid walls (concrete, masonry or aerated concrete)

minimum density 475 kg/m³ (§13.2.1)

minimum thickness of 100 mm. (§13.2.1)

For penetration through flexible walls (gypsum plasterboards walls)

Resistance to fire classification of minimum EI 90 for penetrations classified EI 90

Resistance to fire classification of minimum EI 120 for penetrations classified EI 120 (§13.2.2.1 1)

Minimum thickness of 100 mm. (§13.2.2.1 2)

Minimum two board layers on each side (§13.2.2.1 3)

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 600 mm for floors and walls. (§13.4.3)

Gap between supporting construction and insulation:

the distance shall not exceed 50 mm and should be minimum 10 mm

Sealing medium inside aperture:

For rigid constructions the aperture can be filled with:

Mortar

Concrete

For flexible constructions the aperture can be filled with:

Gypsum plaster/render/filler

The filling has to be free of cavities.

Pipes:

Diameter range and wall thickness range is determined as shown on Annex V01A – H12A.

Materials

For service pipes made from:

Material	Thermal conductivity W/m·K	Melting point °C
Copper	386	1084
Cast iron	58	1127
Steel	43	1425
Stainless Steel	16	1510

Or other metals with a higher melting point and lower thermal conductivity than copper.

Pipe end configuration

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

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

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

Orientation of the pipe

The service pipe can be installed in an angle between 90° – 45° to the supporting construction.

Distance between the services

The pipes can be installed with no void (0 mm distance) between the outer surfaces of the pipe insulation.

Insulation:

The thickness range of the insulation is shown on Annex V01A – H12A.

The thickness can be increased above the specification given in the annexes for pipes with continued insulation.

The density of the insulation may be increased but not reduced.

The length from the center of the supporting construction to the end of the insulation may be increased from the insulation length given in Annex V01A – H12A.

The joint between 2 pipe sections can be closed using aluminum tape.

5 Limitations

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

Danish Institute of Fire and Security Technology

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SAINT-GOBAIN ISOVER G+H AG

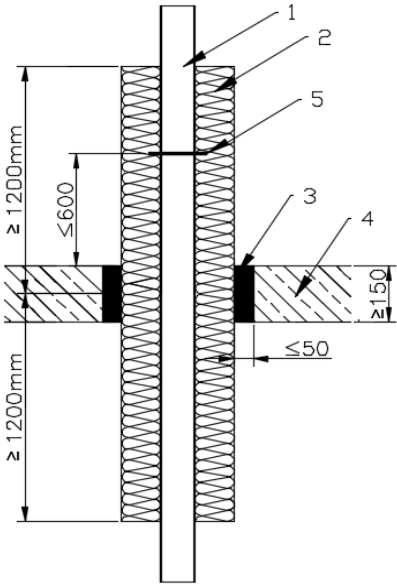
Bürgermeister-Grünzweig-Strasse 1
67059 Ludwigshafen
Germany

EI 120 - Vertical pipe direction

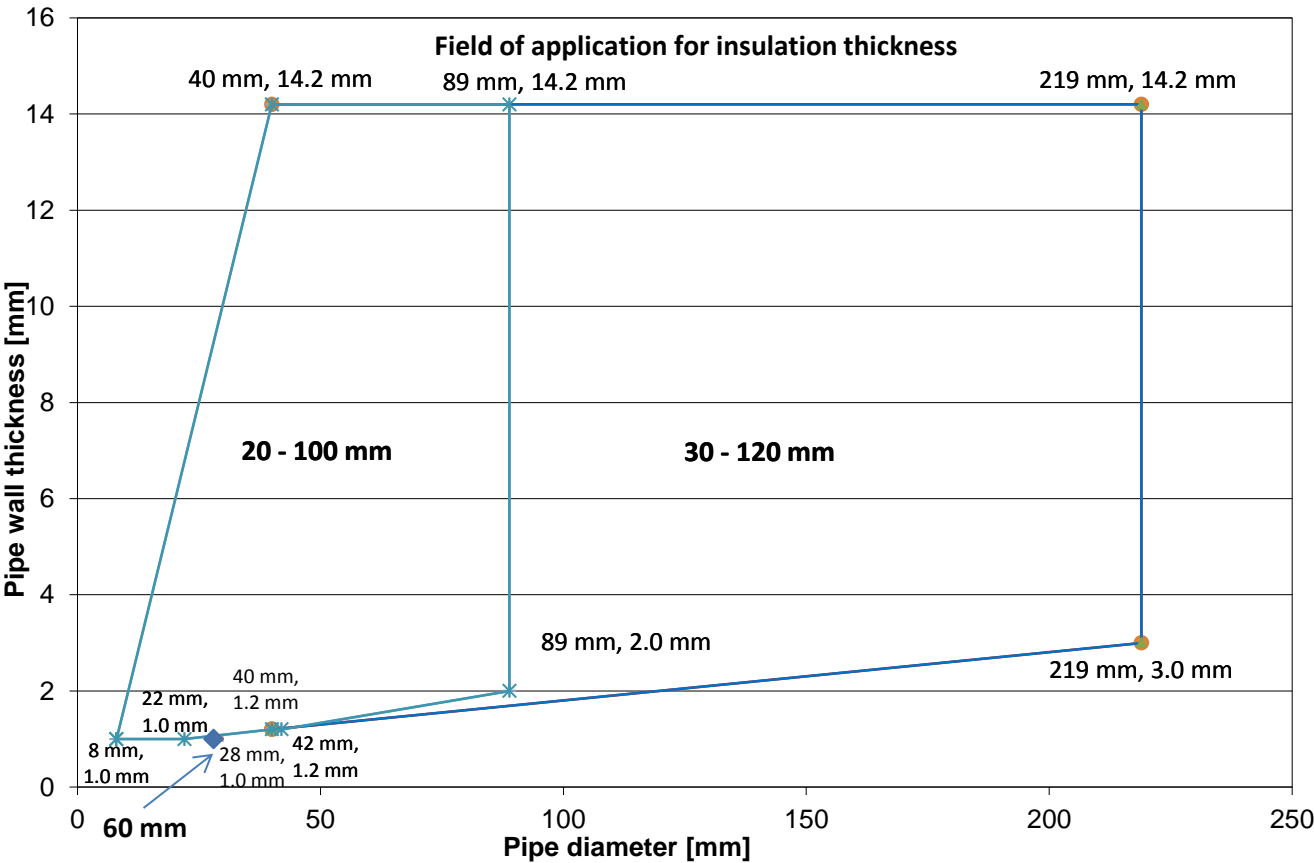
U Protect Pipe Section Alu2

Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2
		fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

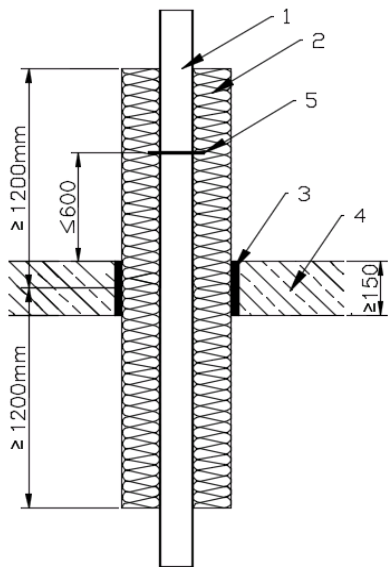


EI 120 - Vertical pipe direction

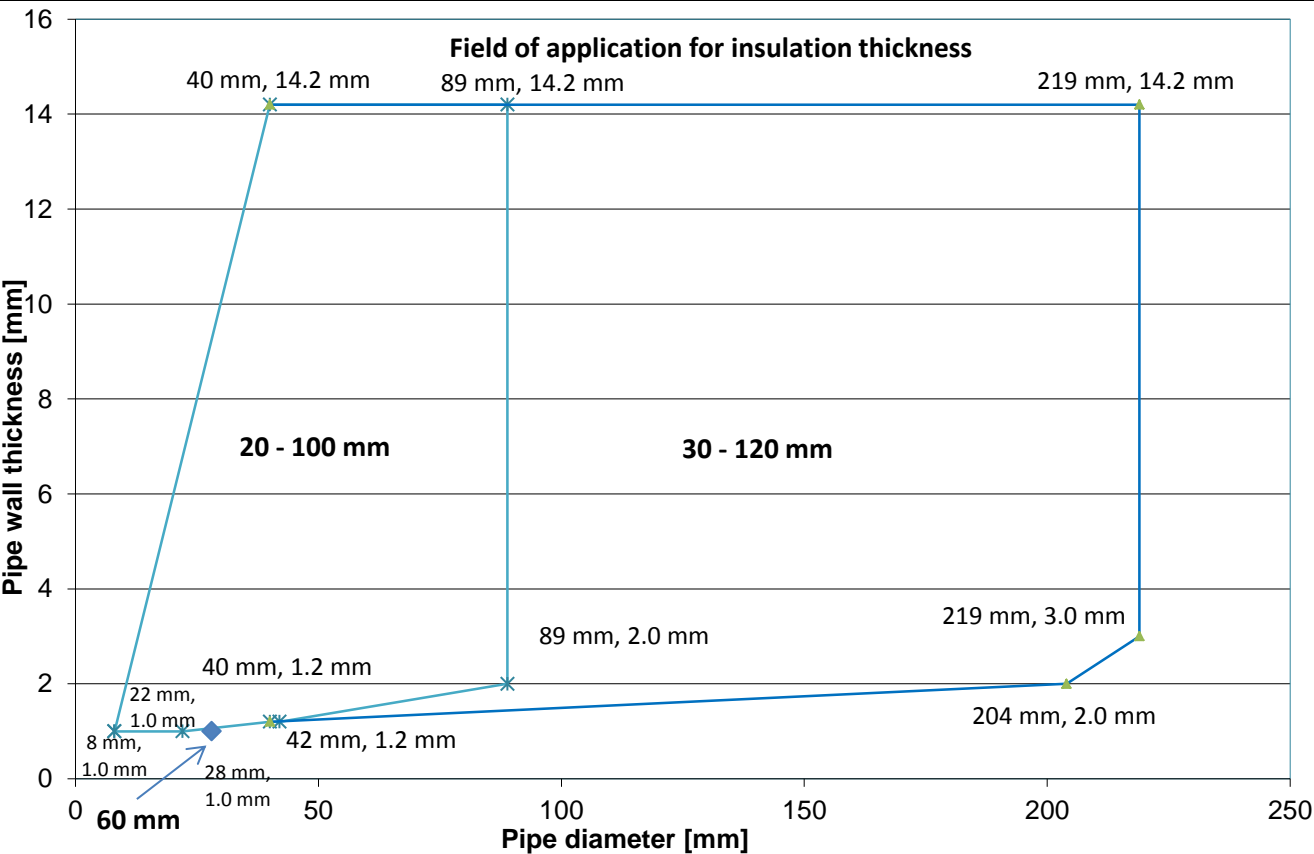
U Protect Pipe Section Alu2

Local, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

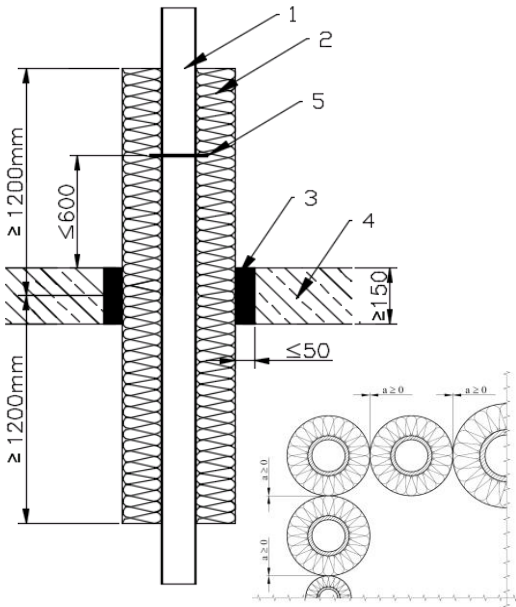


EI 120 - Vertical pipe direction

U Protect Pipe Section Alu2

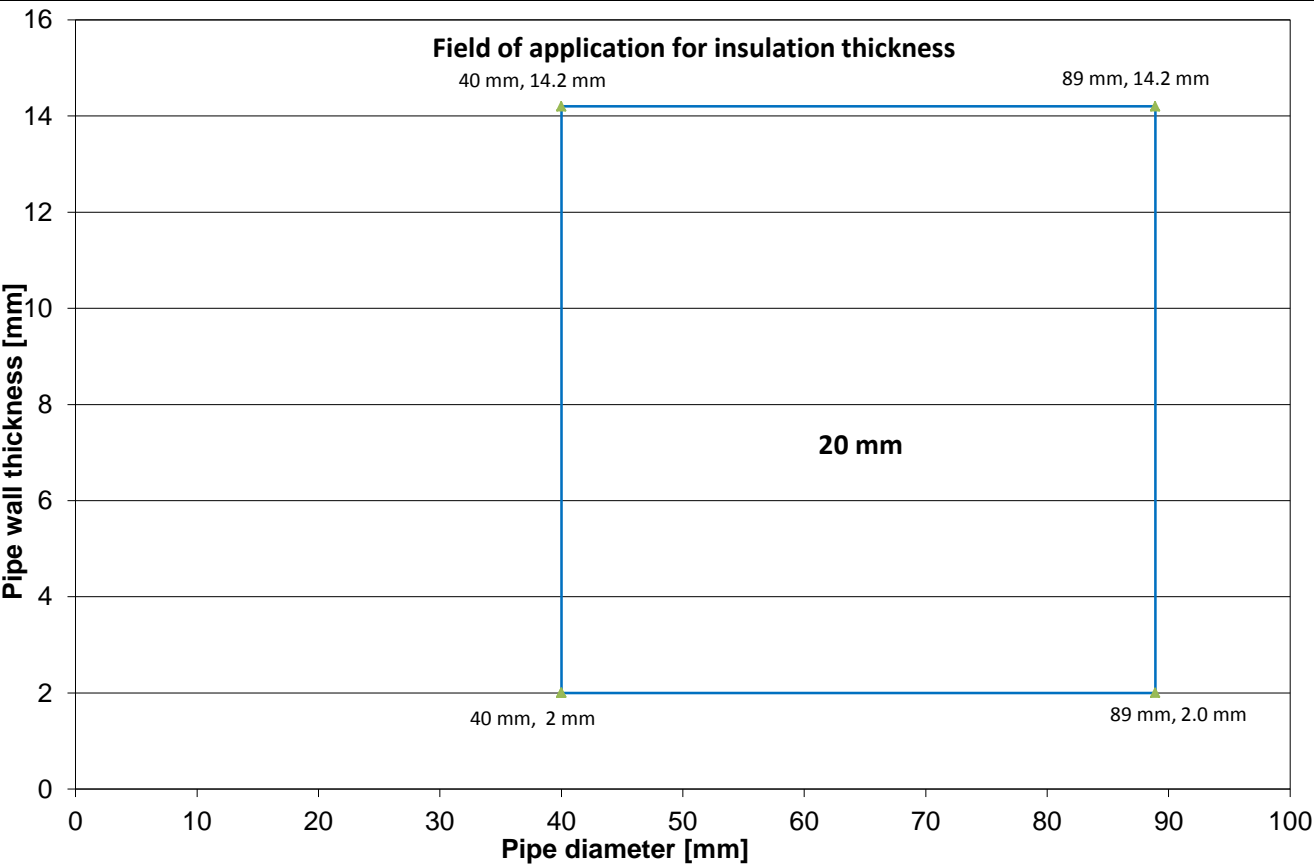
Local/Continued, Sustained insulation, Cluster arrangement

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB. For continued insulation the thickness of the insulation can be increased

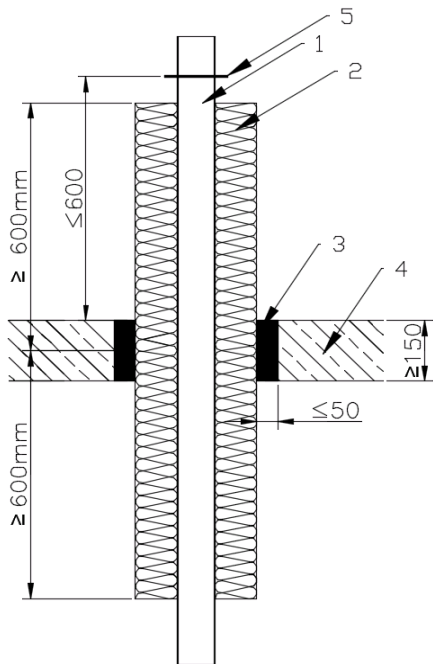


EI 120 - Vertical pipe direction

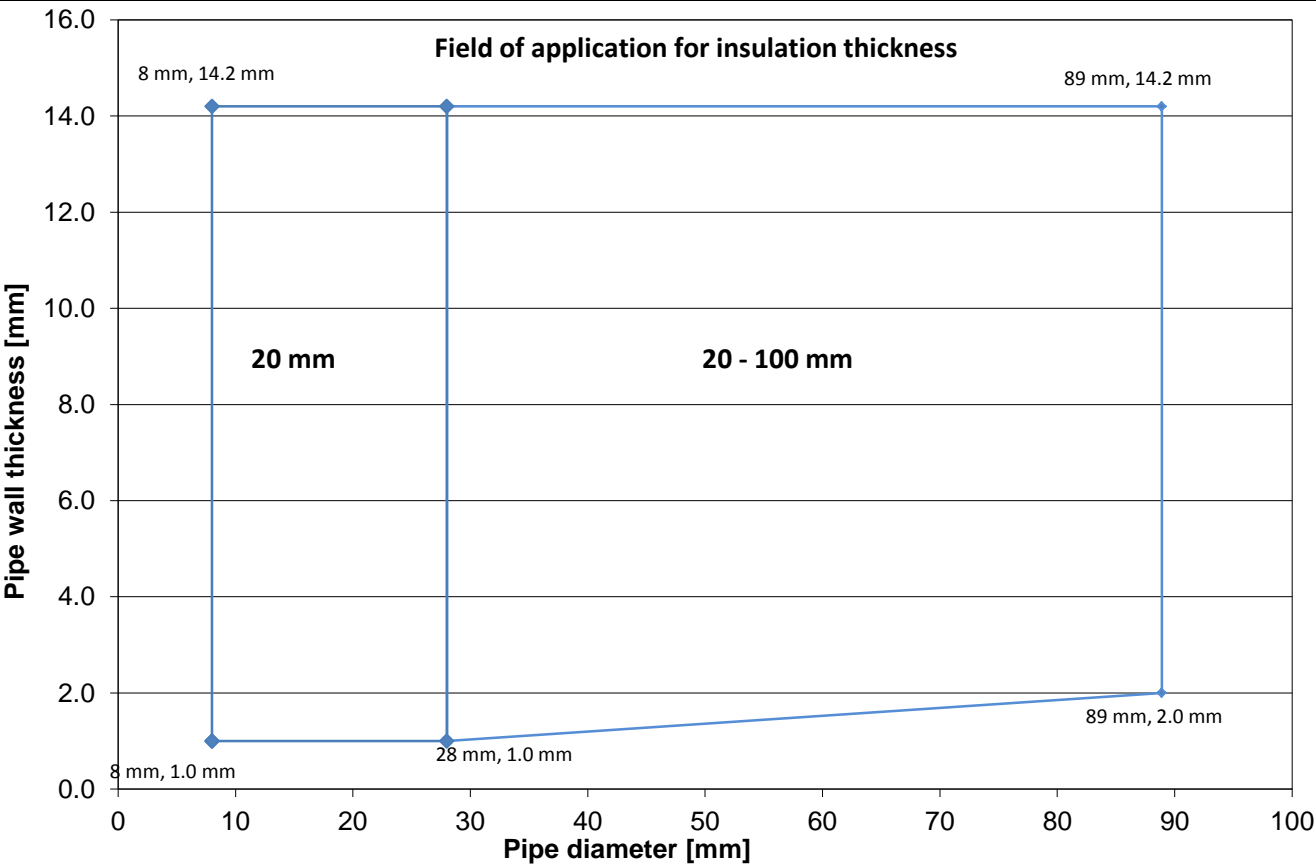
U Protect Pipe Section Alu2

Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

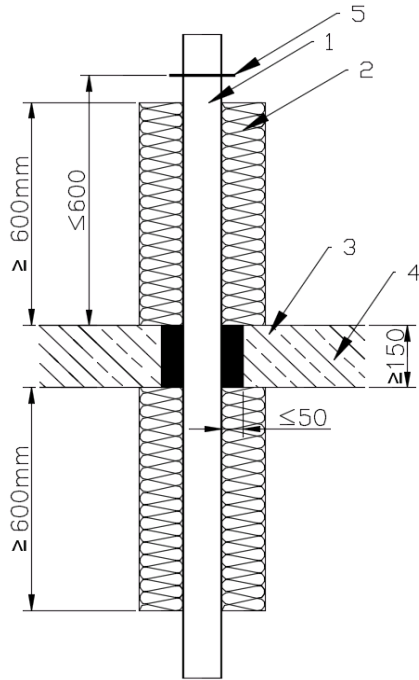


EI 120 - Vertical pipe direction

U Protect Pipe Section Alu2

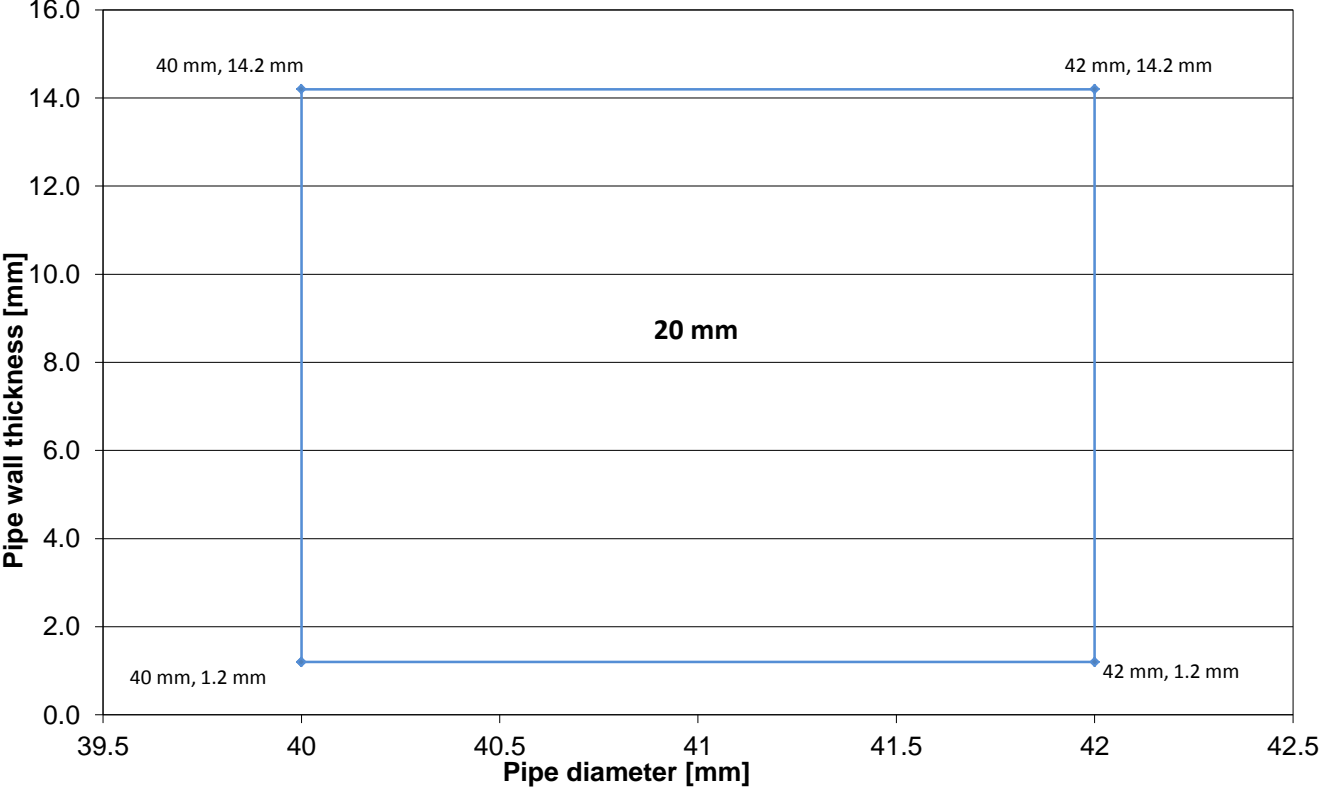
Local, Interrupted insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness



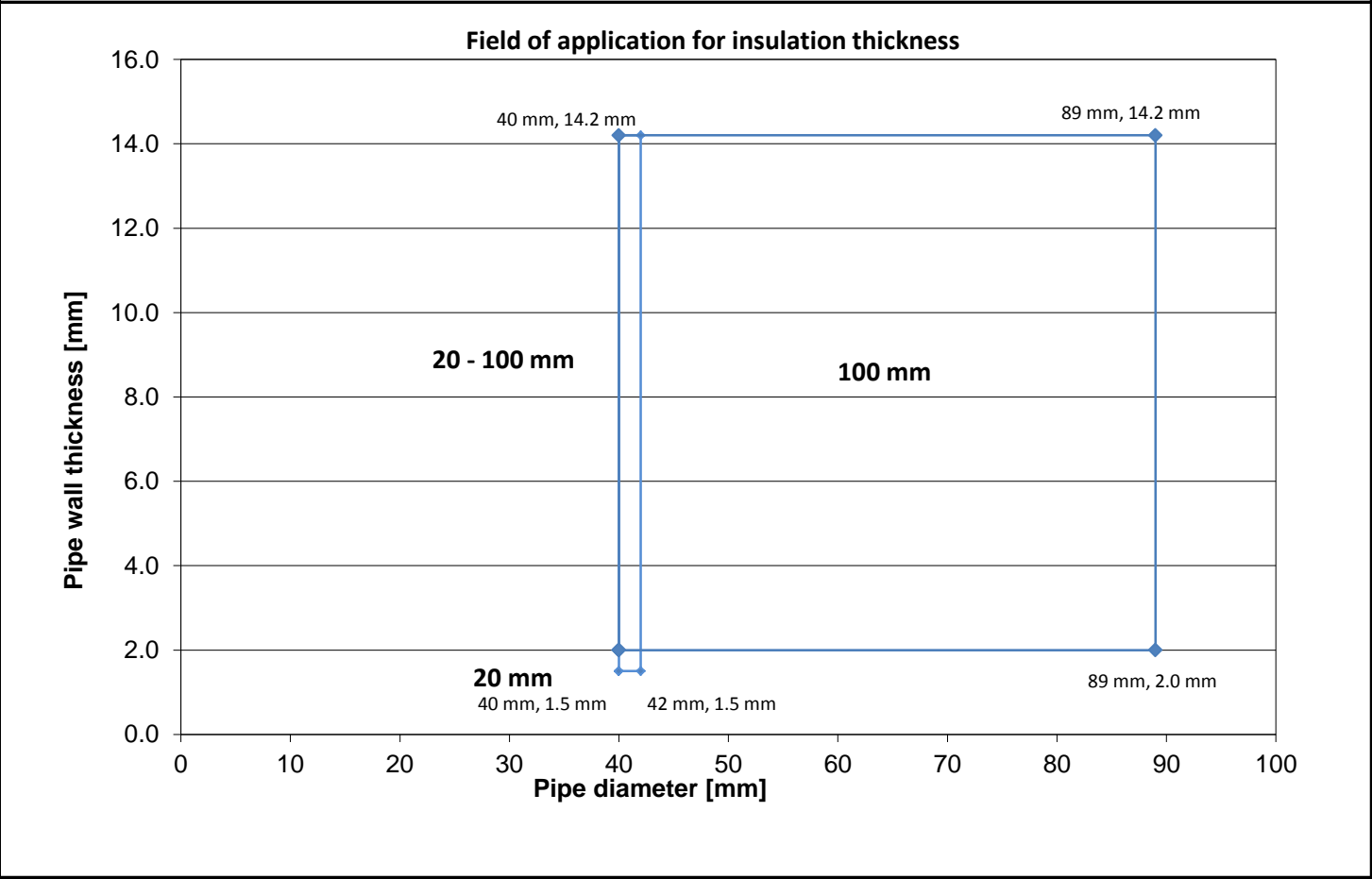
EI 120 - Vertical pipe direction

U Protect Pipe Section Alu2

Local, Sustained asymmetrical insulation

Copper, Cast iron, Steel and Stainless steel pipes

No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

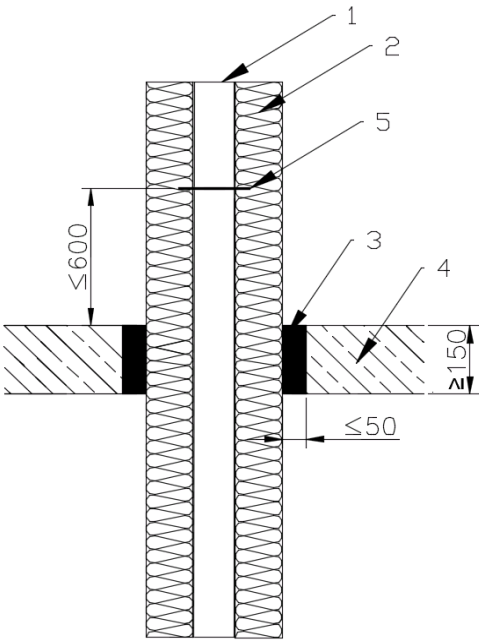


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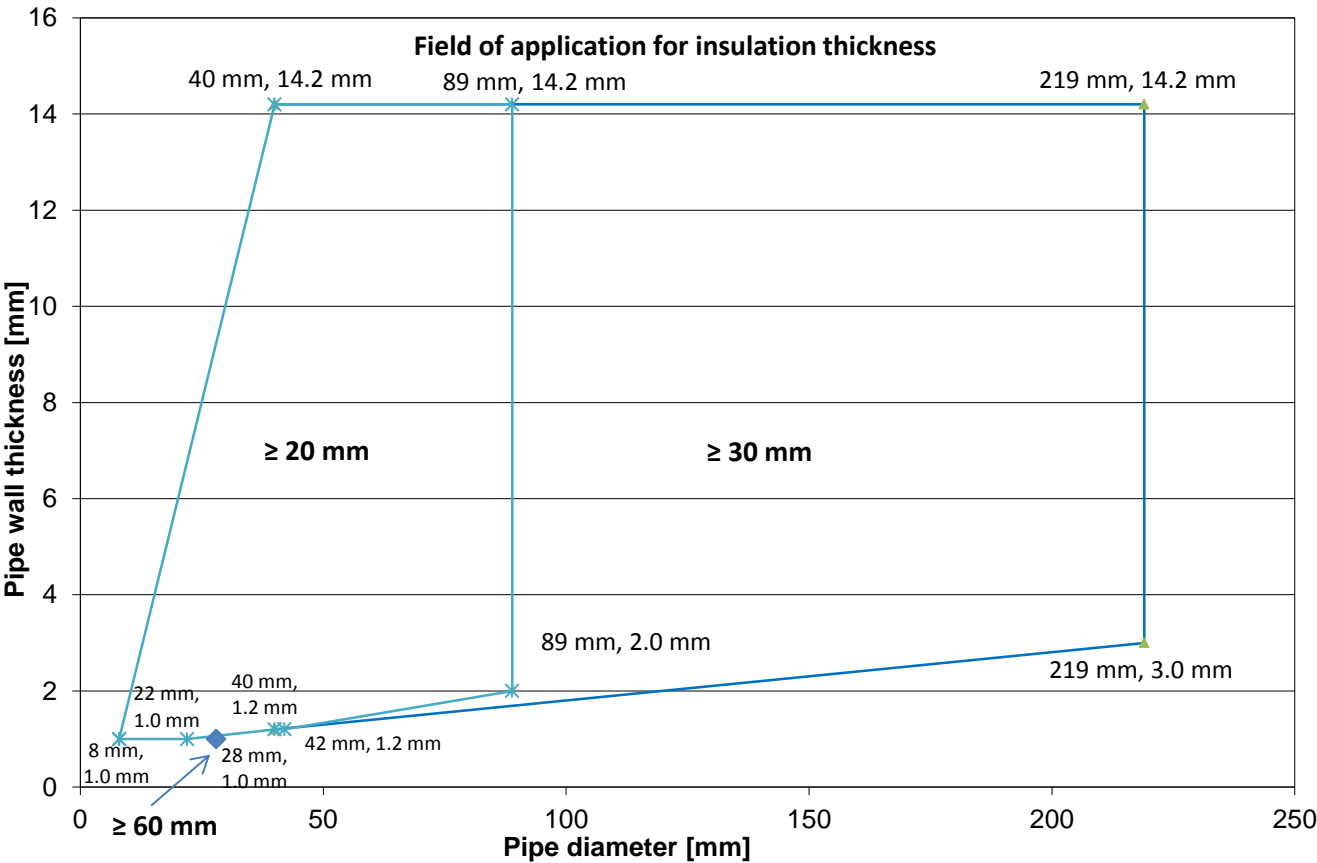
U Protect Pipe Section Alu2

Continued, Sustained insulation

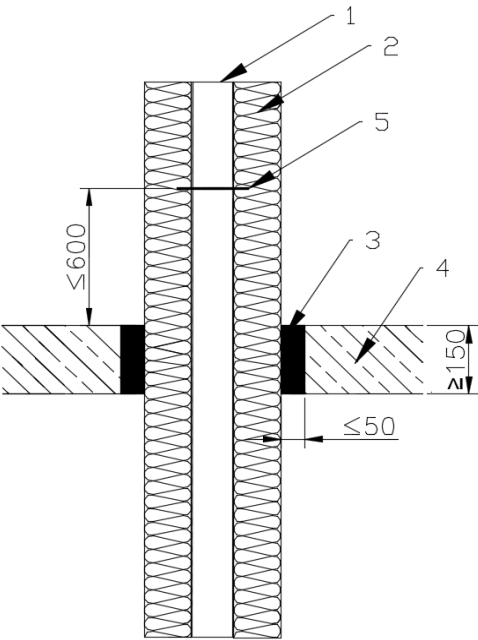
Copper, Cast iron, Steel and Stainless steel pipes



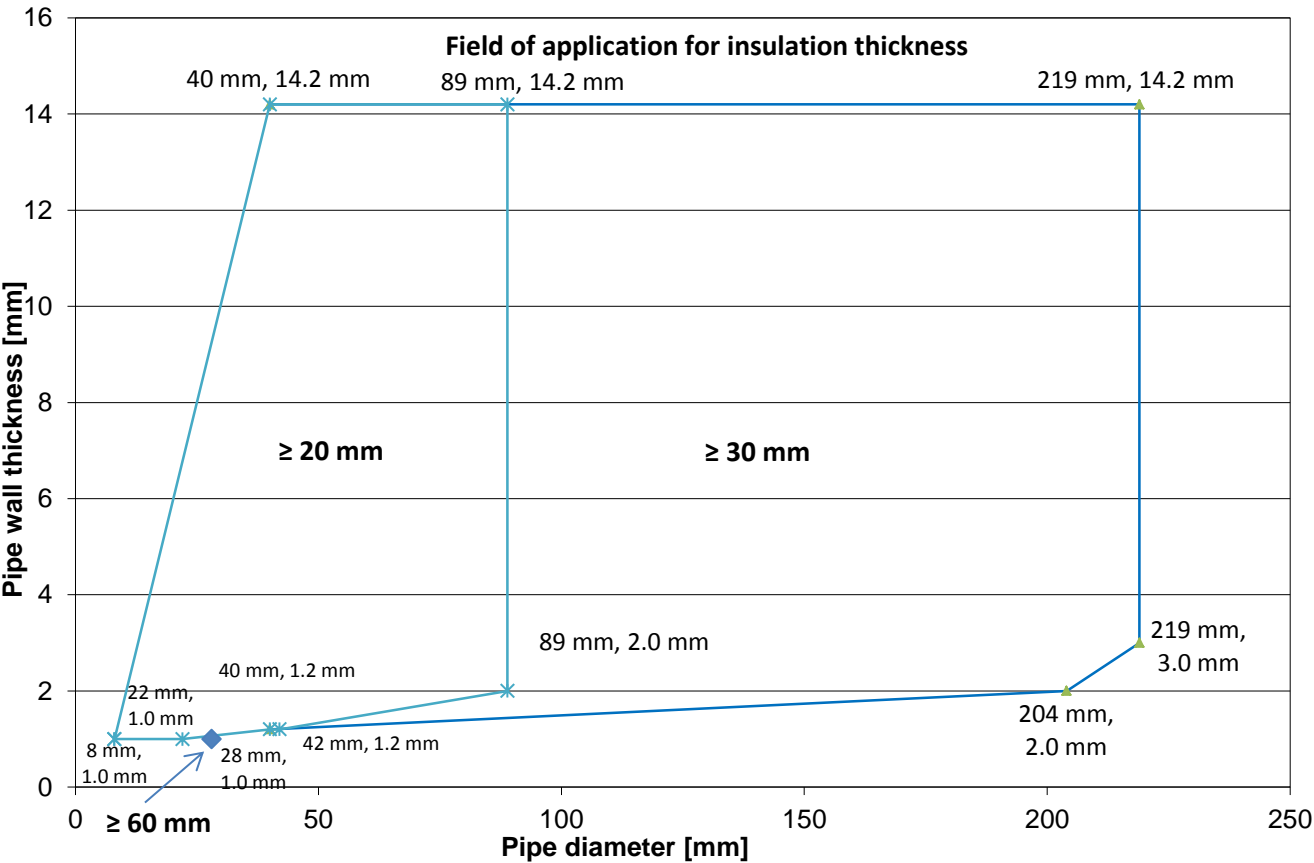
No.	Item	Description
1	Pipe	Copper, Cast iron, Steel, Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger



EI 120 - Vertical pipe direction
U Protect Pipe Section Alu2
 Continued, Sustained insulation
 Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

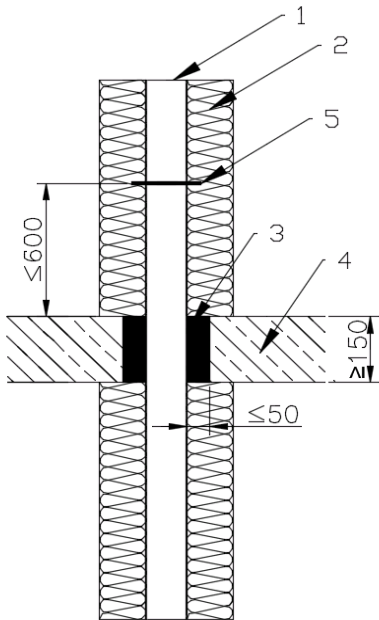


EI 120 - Vertical pipe direction

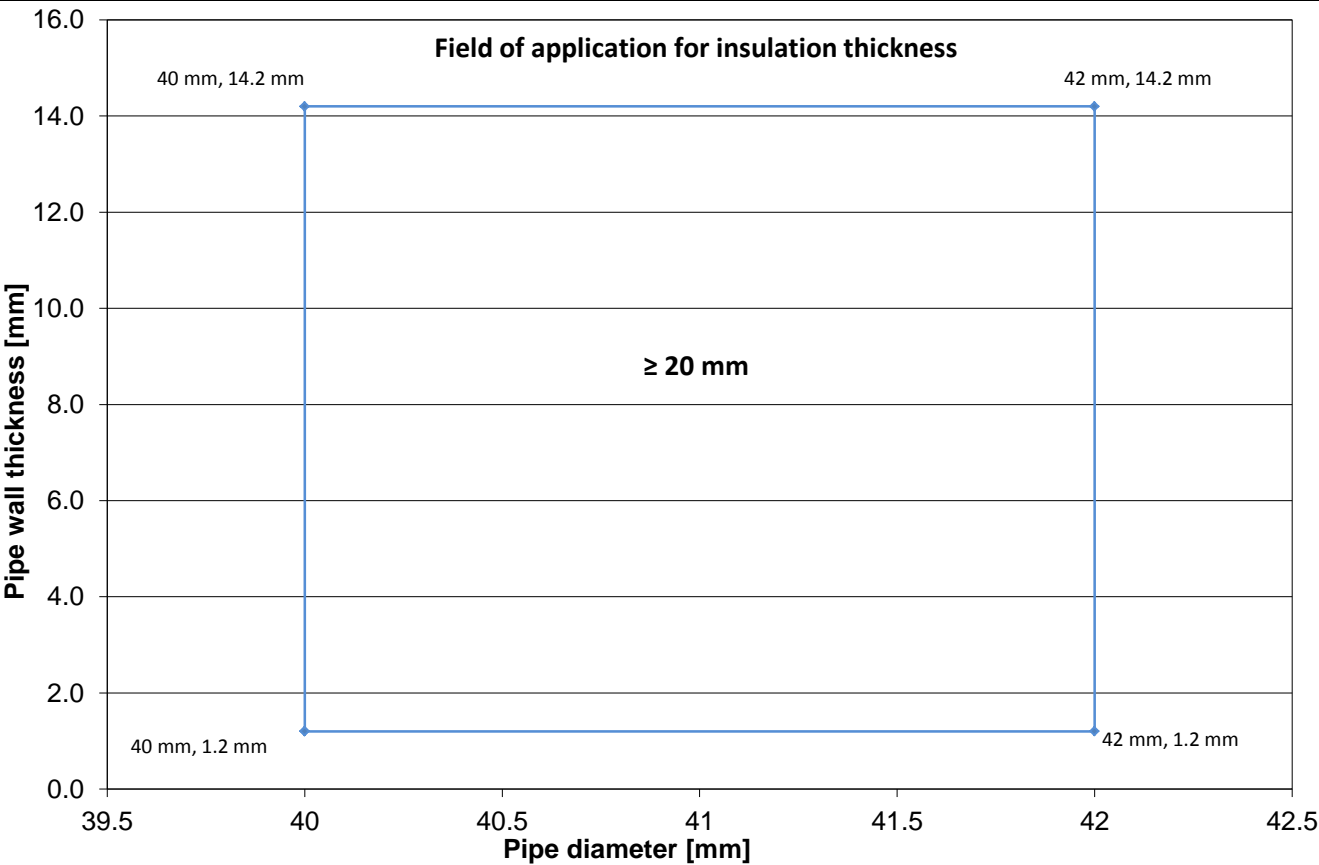
U Protect Pipe Section Alu2

Continued, Interrupted insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

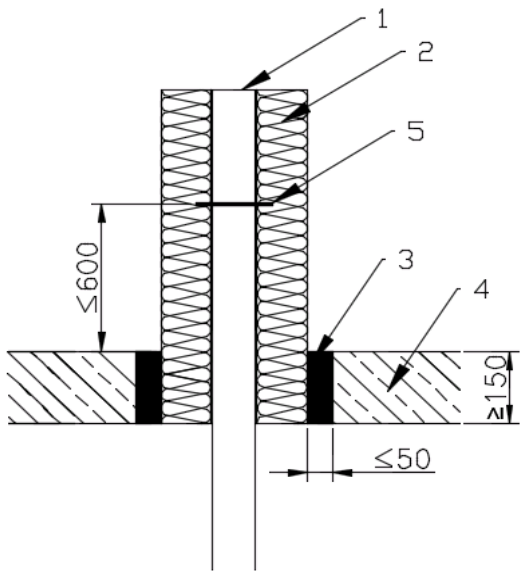


EI 120 - Vertical pipe direction

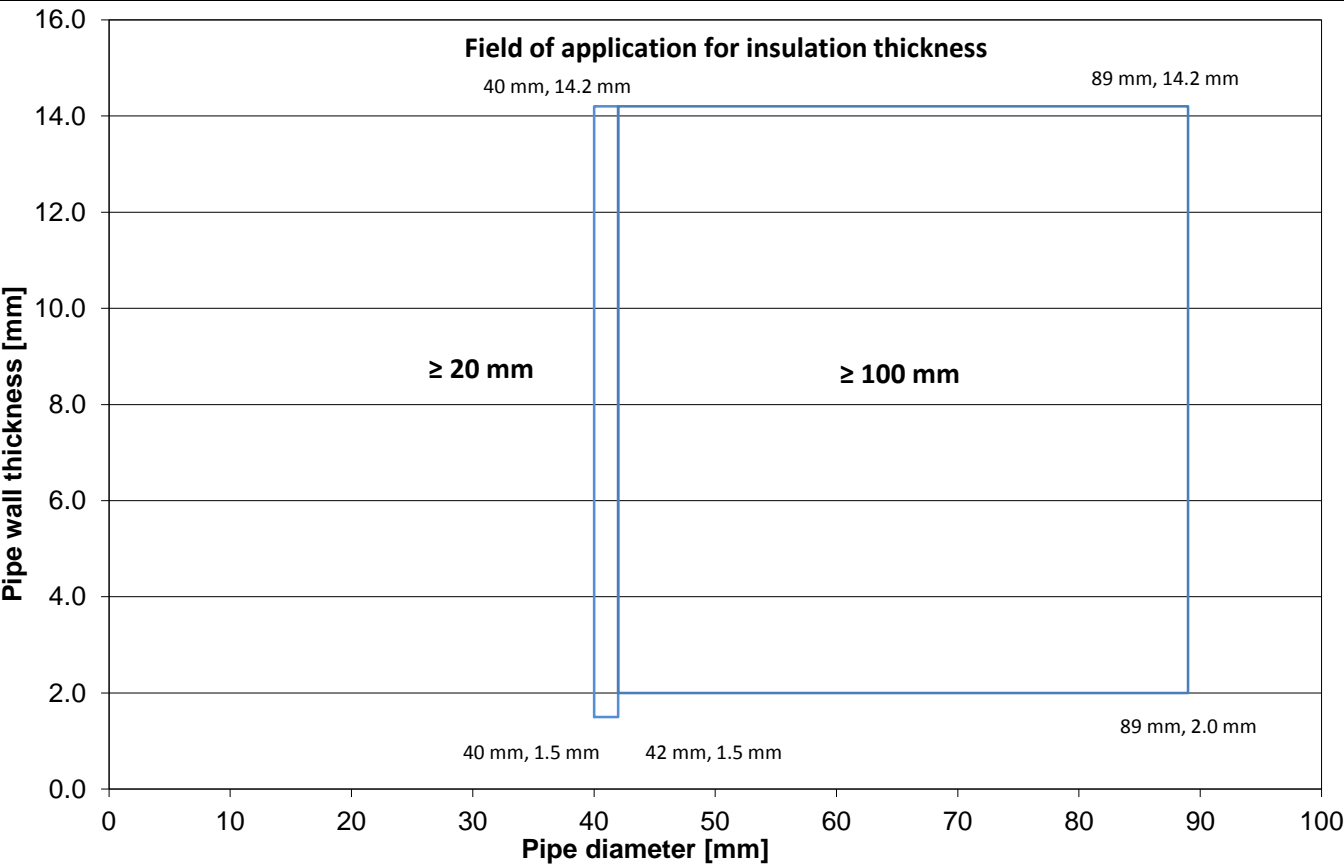
U Protect Pipe Section Alu2

Continued, Sustained asymmetrical insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

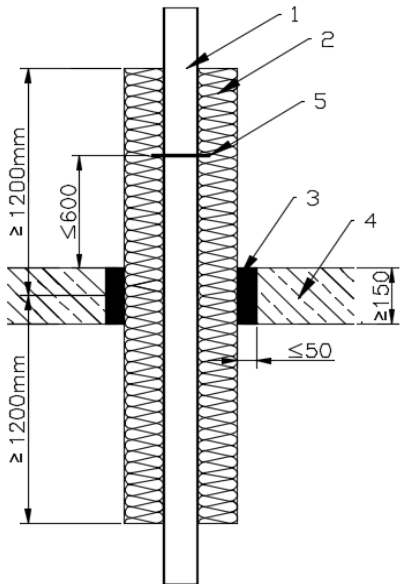


El 90 - Vertical pipe direction

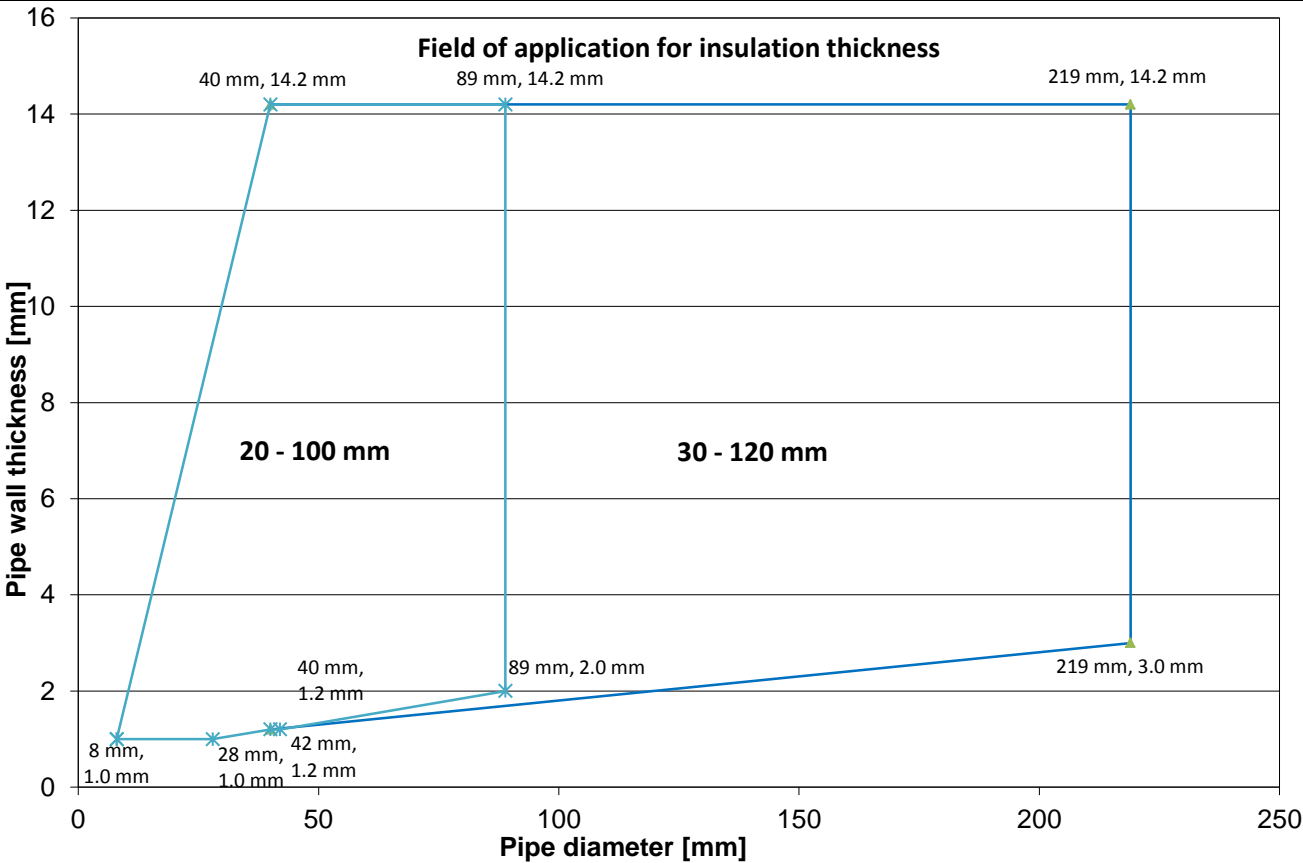
U Protect Pipe Section Alu2

Local,Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
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4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

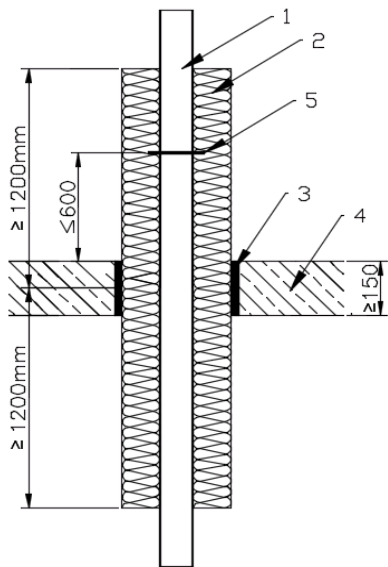


El 90 - Vertical pipe penetraion

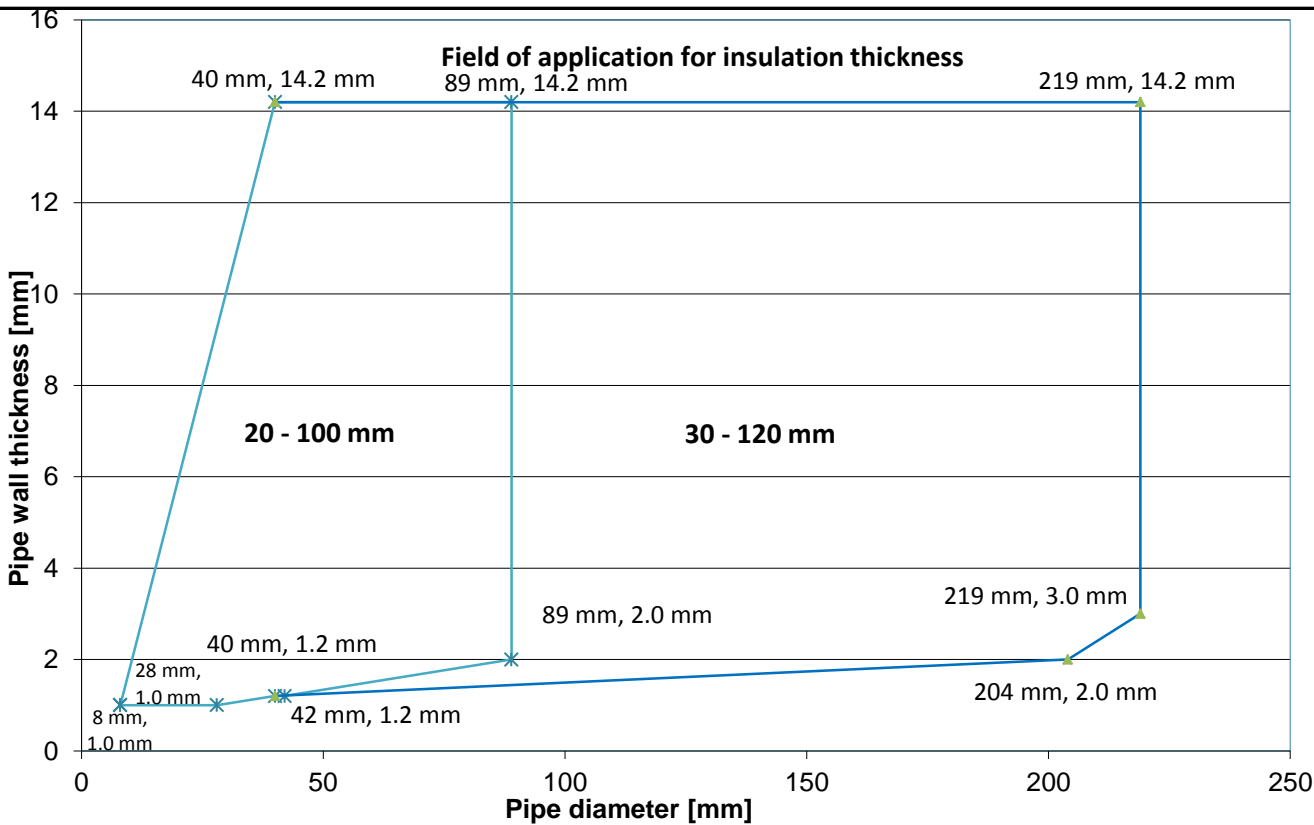
U Protect Pipe Section Alu2

Local, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2
		fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
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5	Service support	Metal hanger

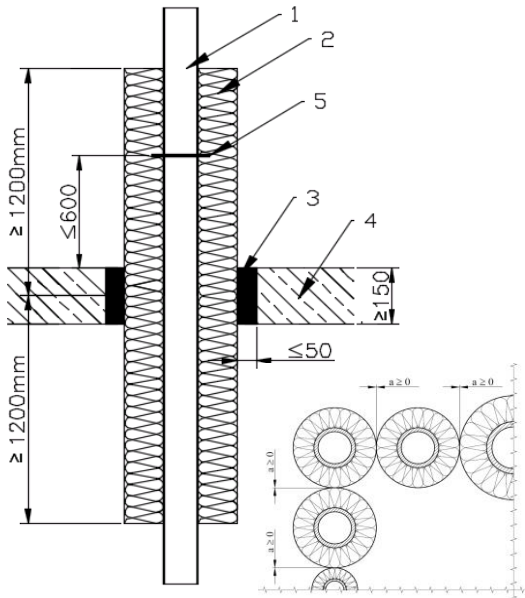


El 90 - Vertical pipe direction

U Protect Pipe Section Alu2

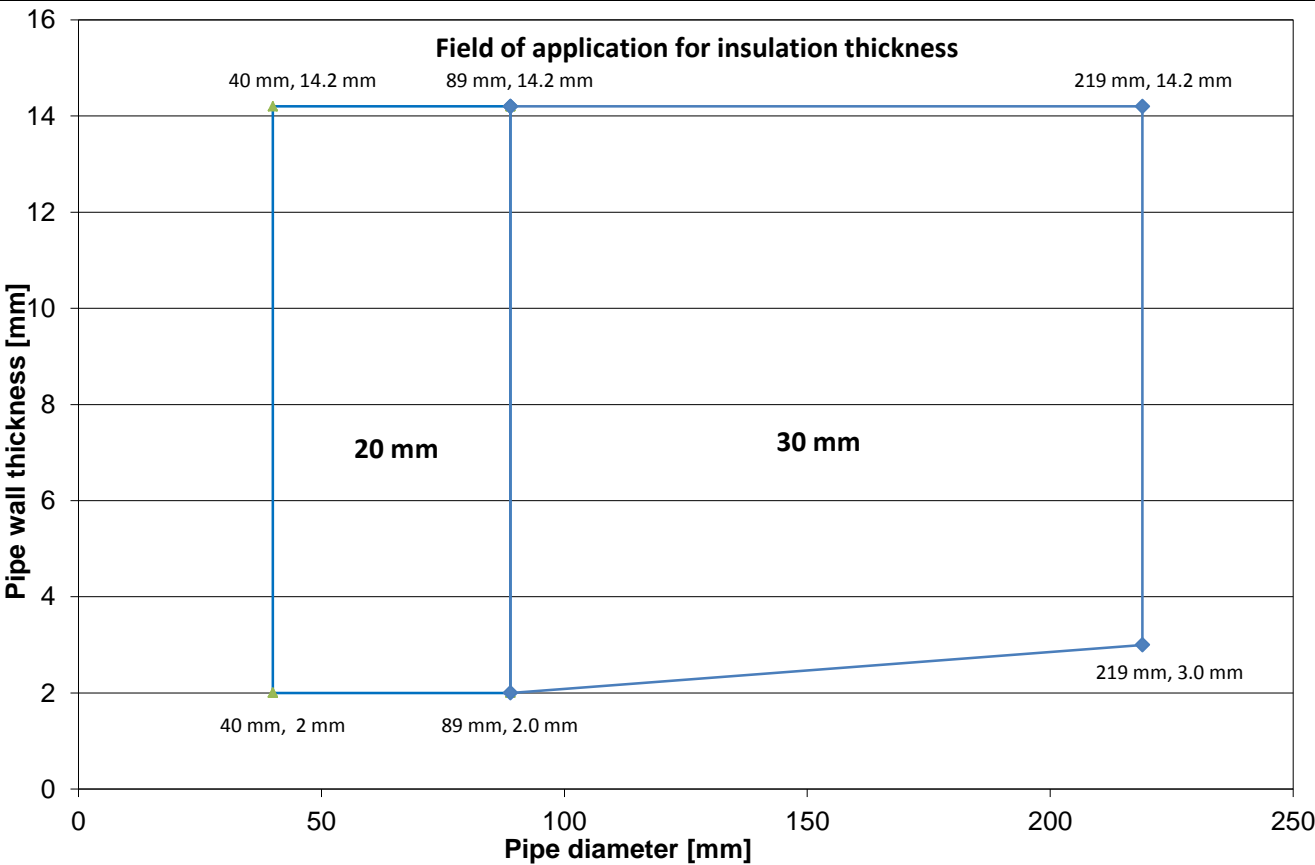
Local/Continued, Sustained insulation, Cluster arrangement

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB. For continued insulation the thickness of the insulation can be increased

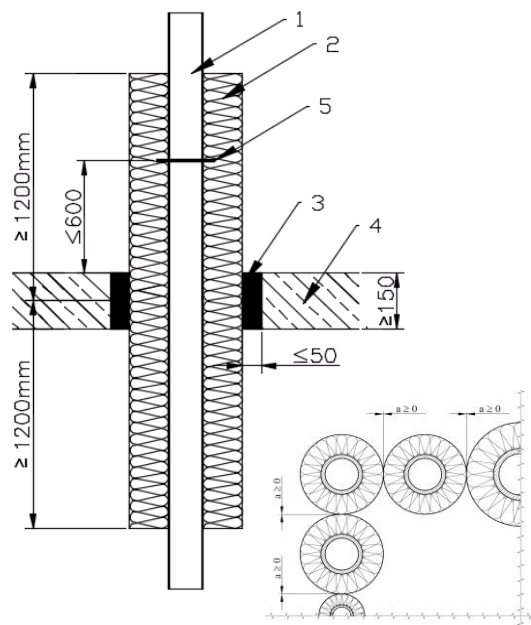


El 90 - Vertical pipe direction

U Protect Pipe Section Alu2

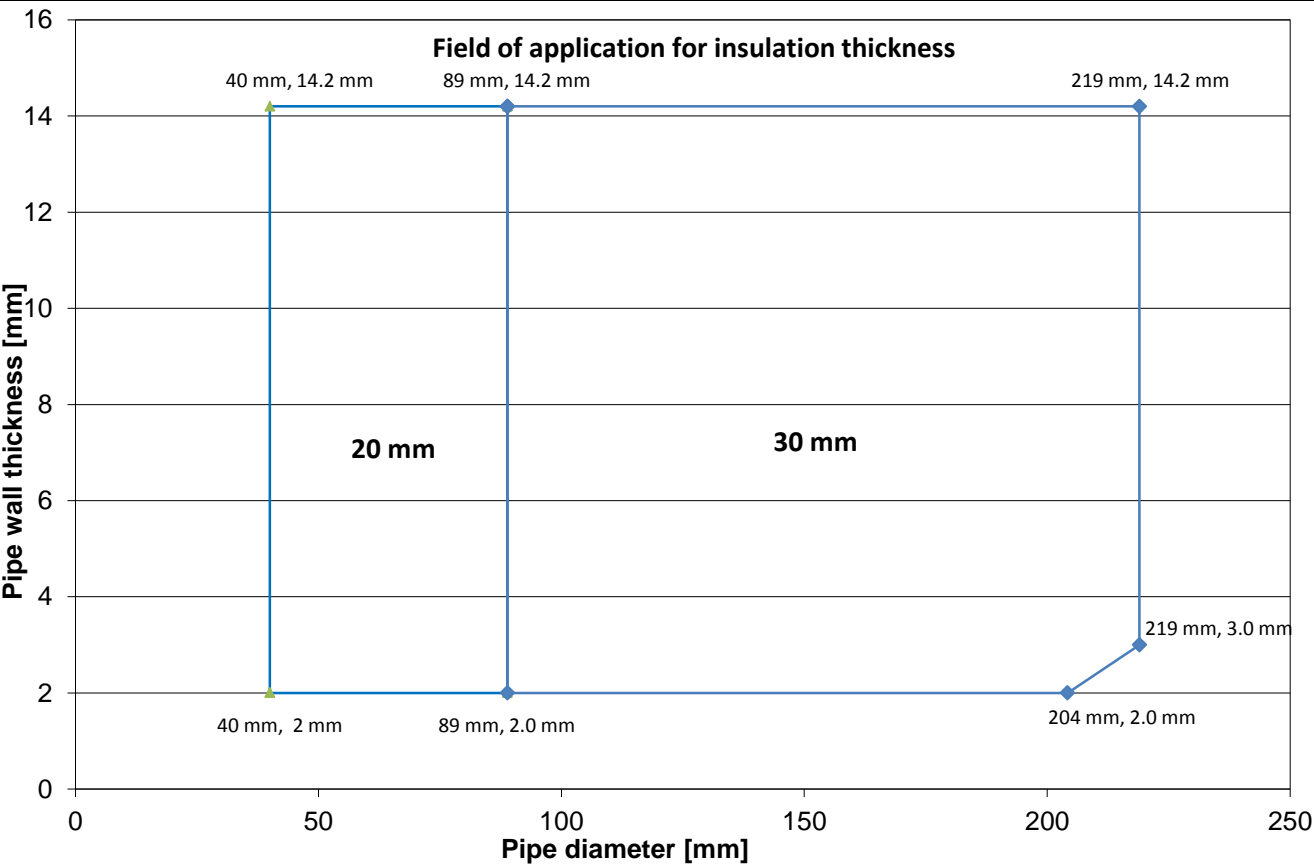
Local/Continued, Sustained insulation, Cluster arrangement

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
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NB. For continued insulation the thickness of the insulation can be increased

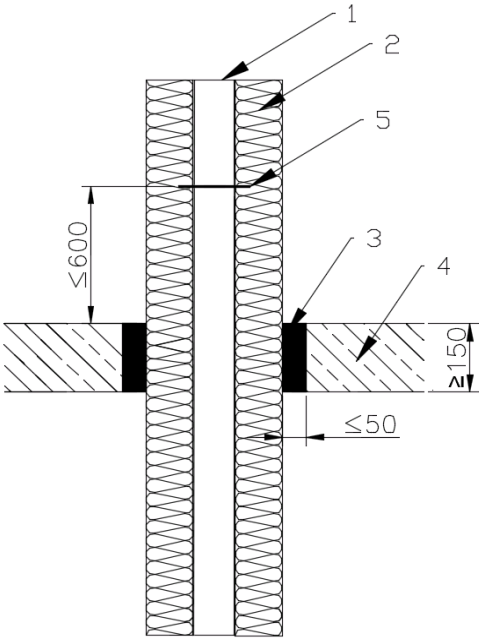


El 90 - Vertical pipe direction

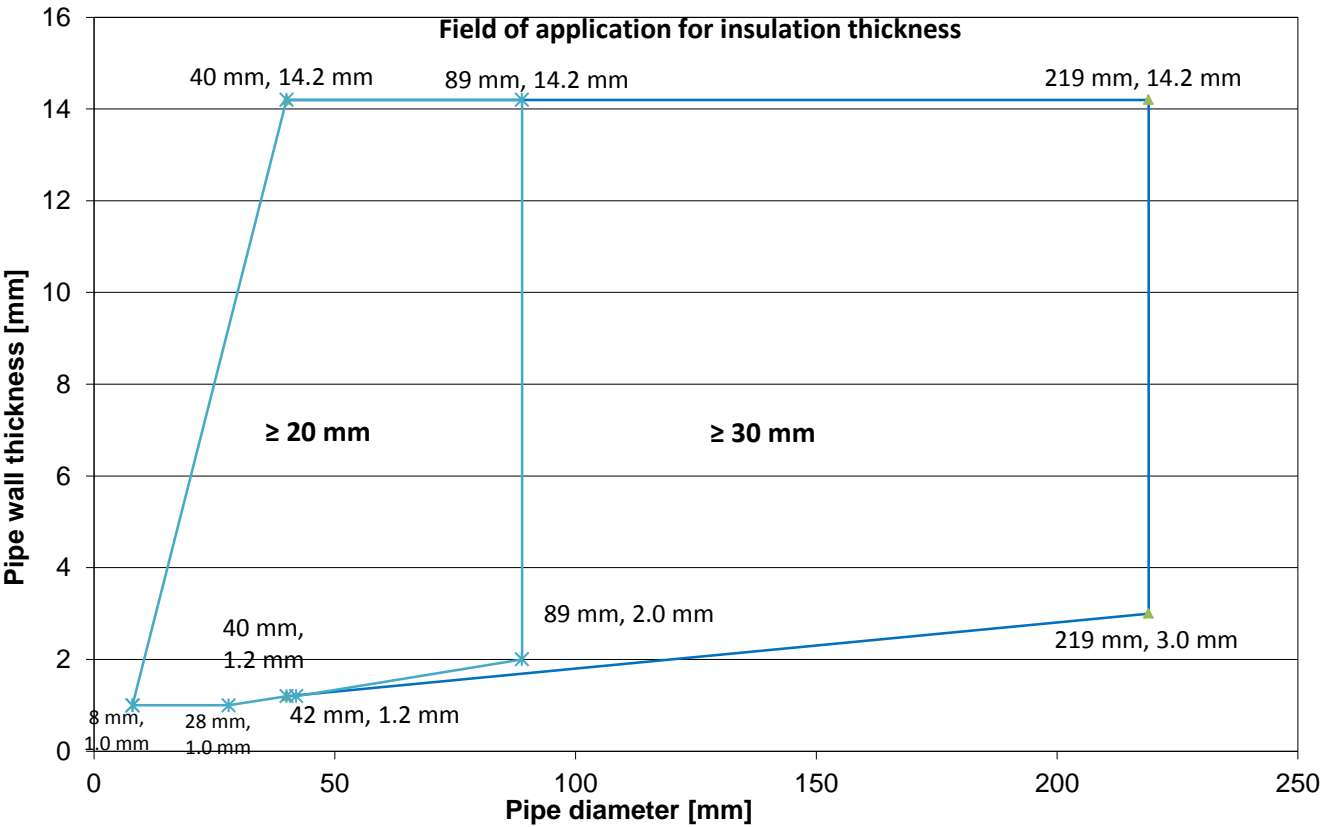
U Protect Pipe Section Alu2

Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
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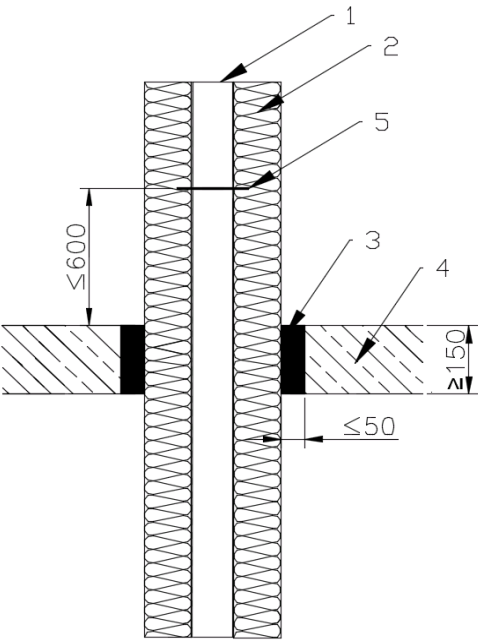


El 90 - Vertical pipe direction

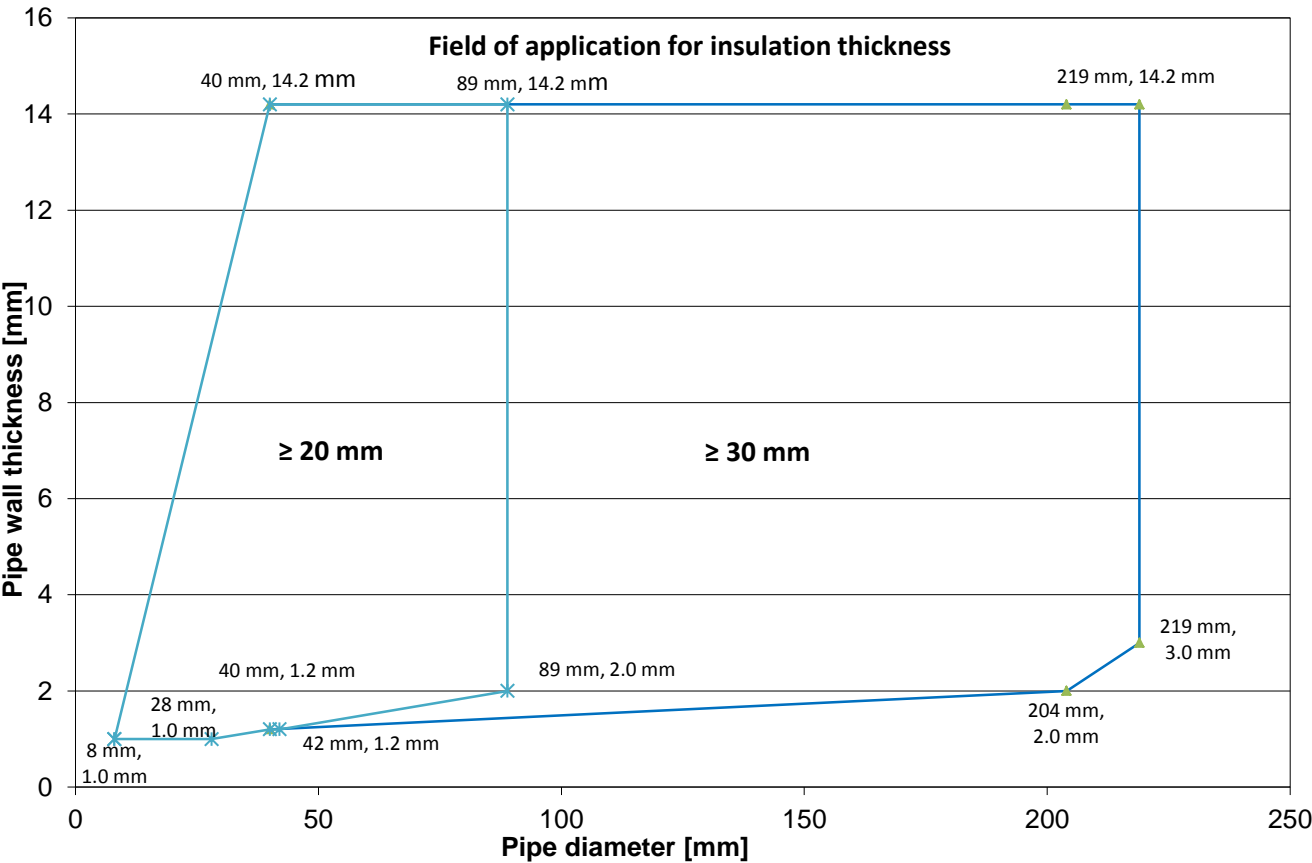
U Protect Pipe Section Alu2

Continued, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

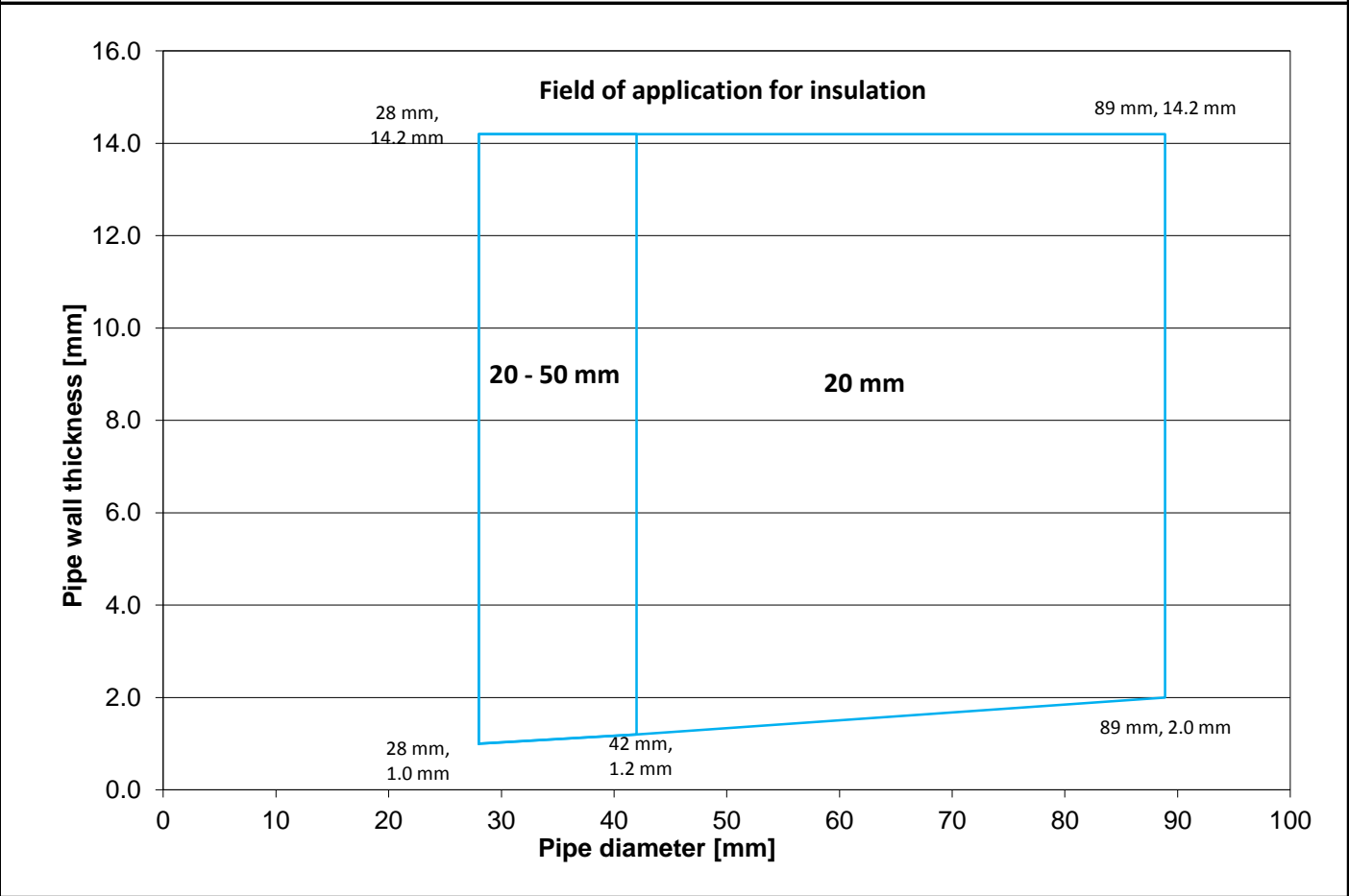
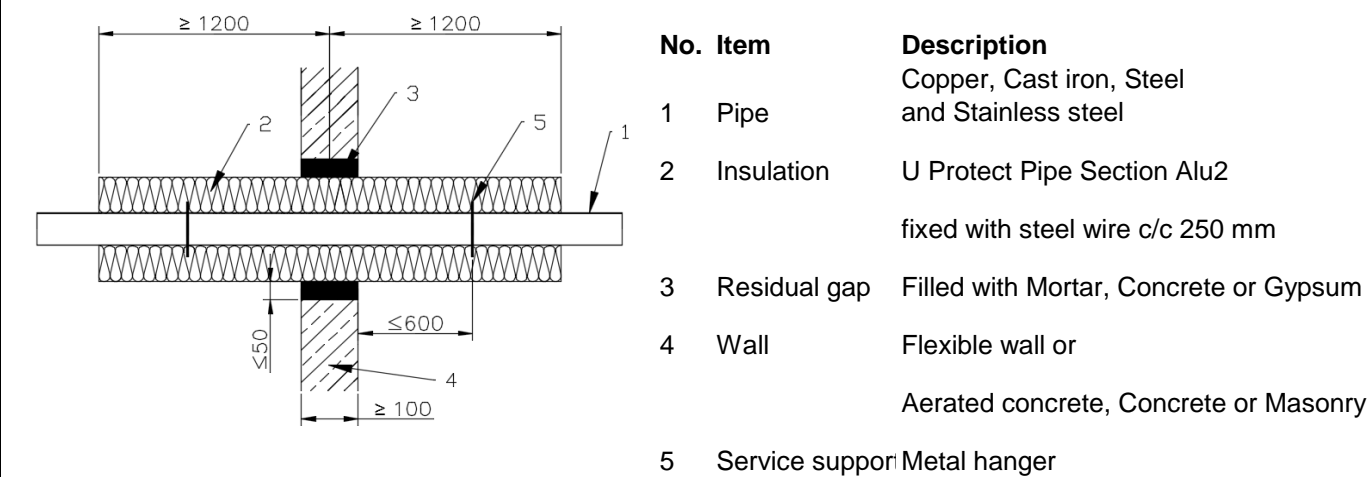


El 120 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes

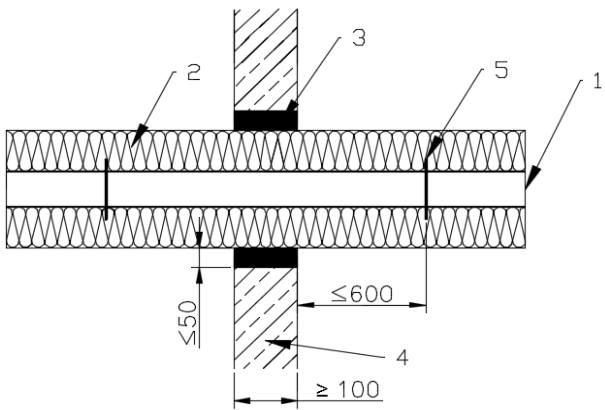


EI 120 - Horizontal pipe direction

U Protect Pipe Section Alu2

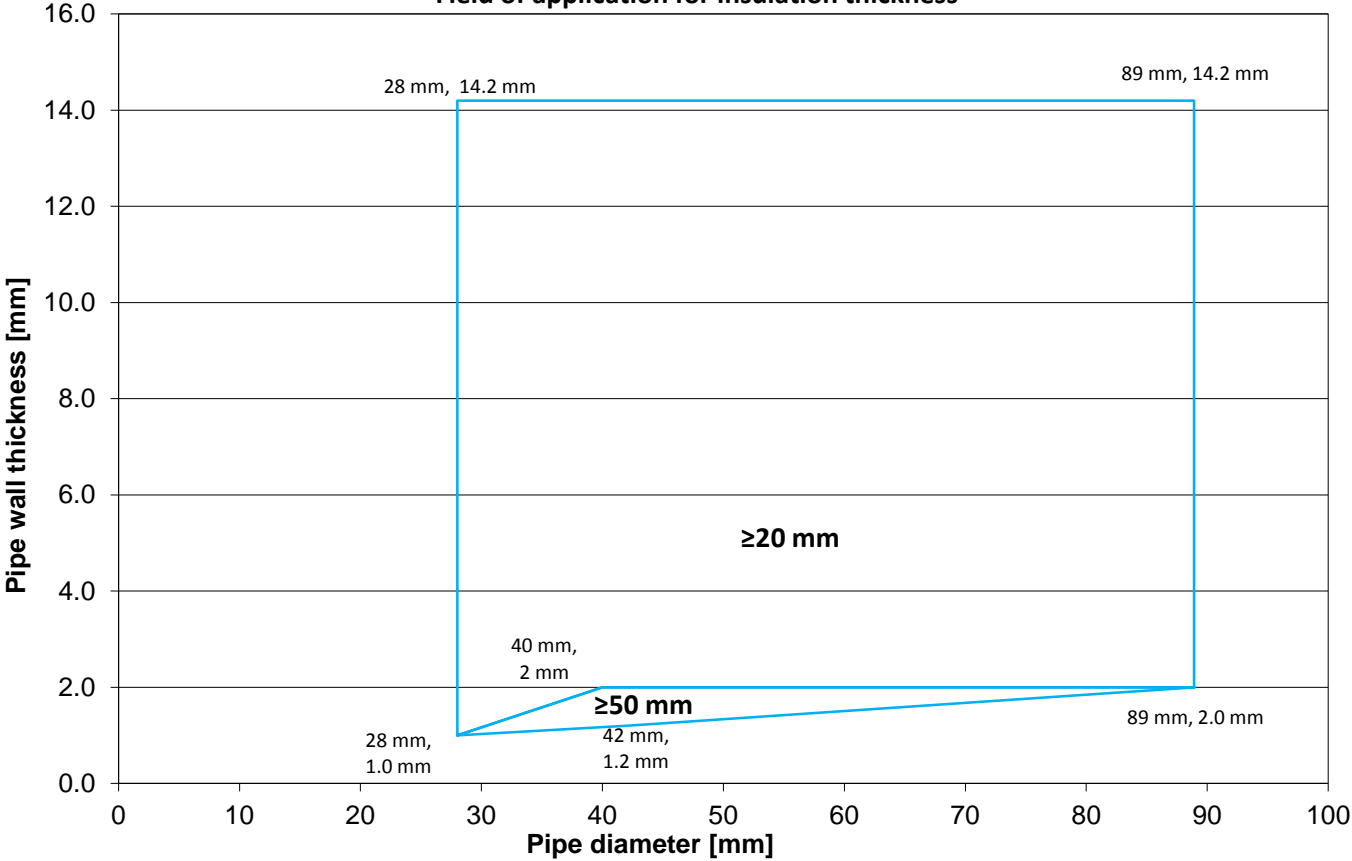
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

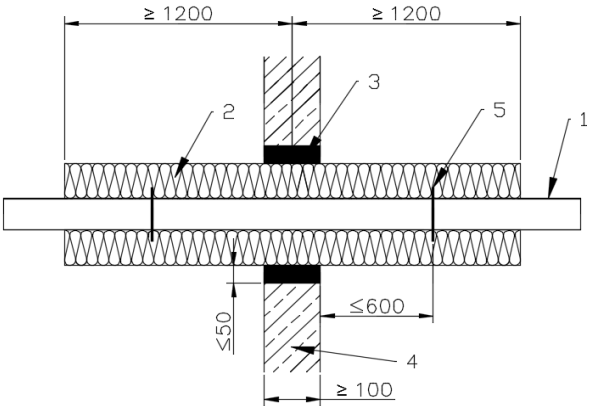


El 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

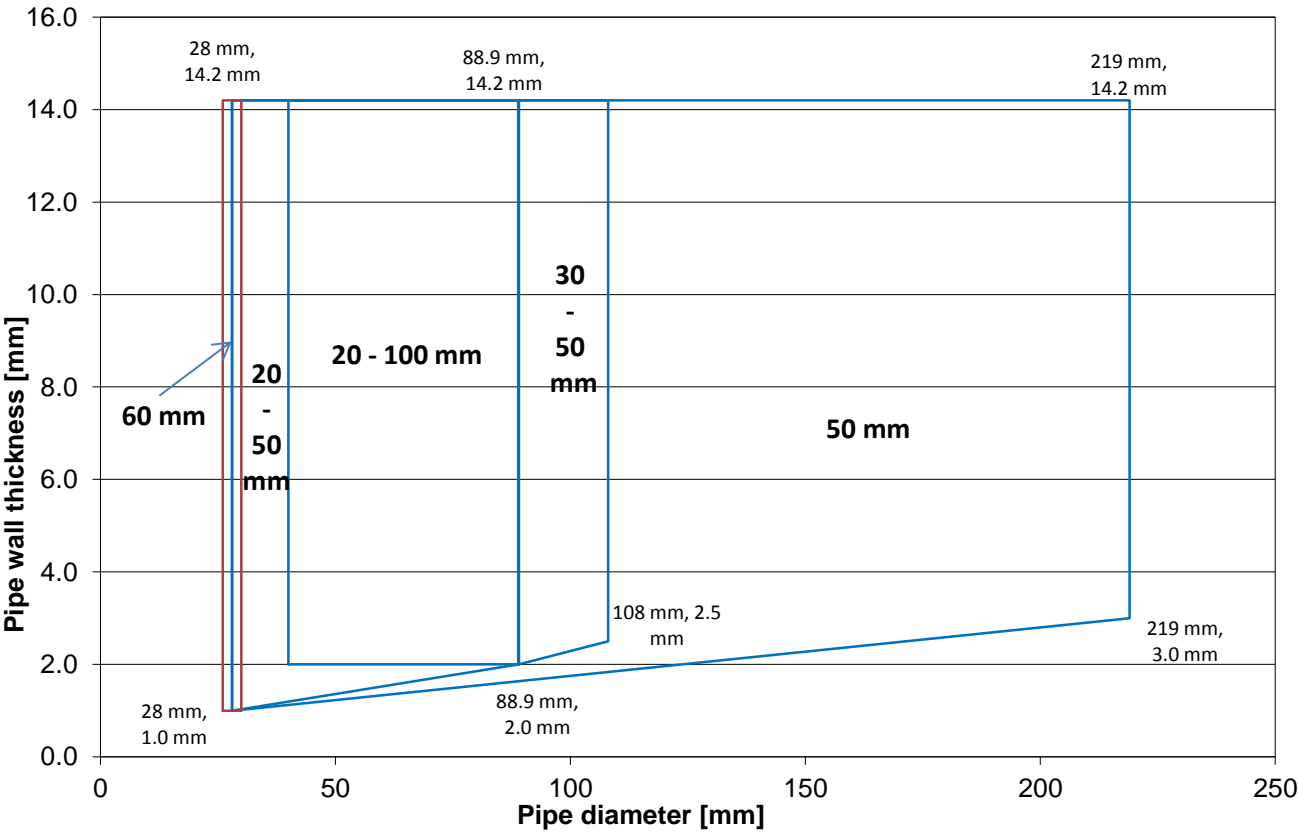
Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes

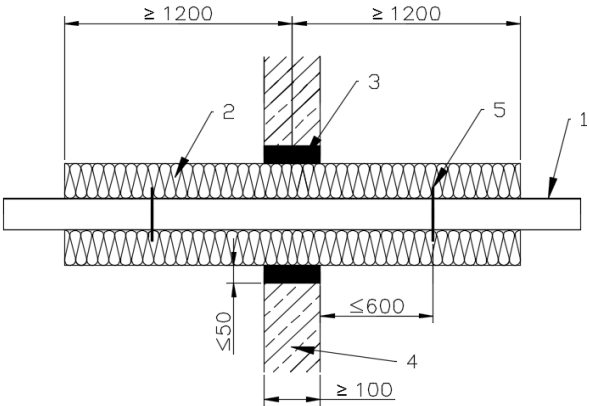


No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

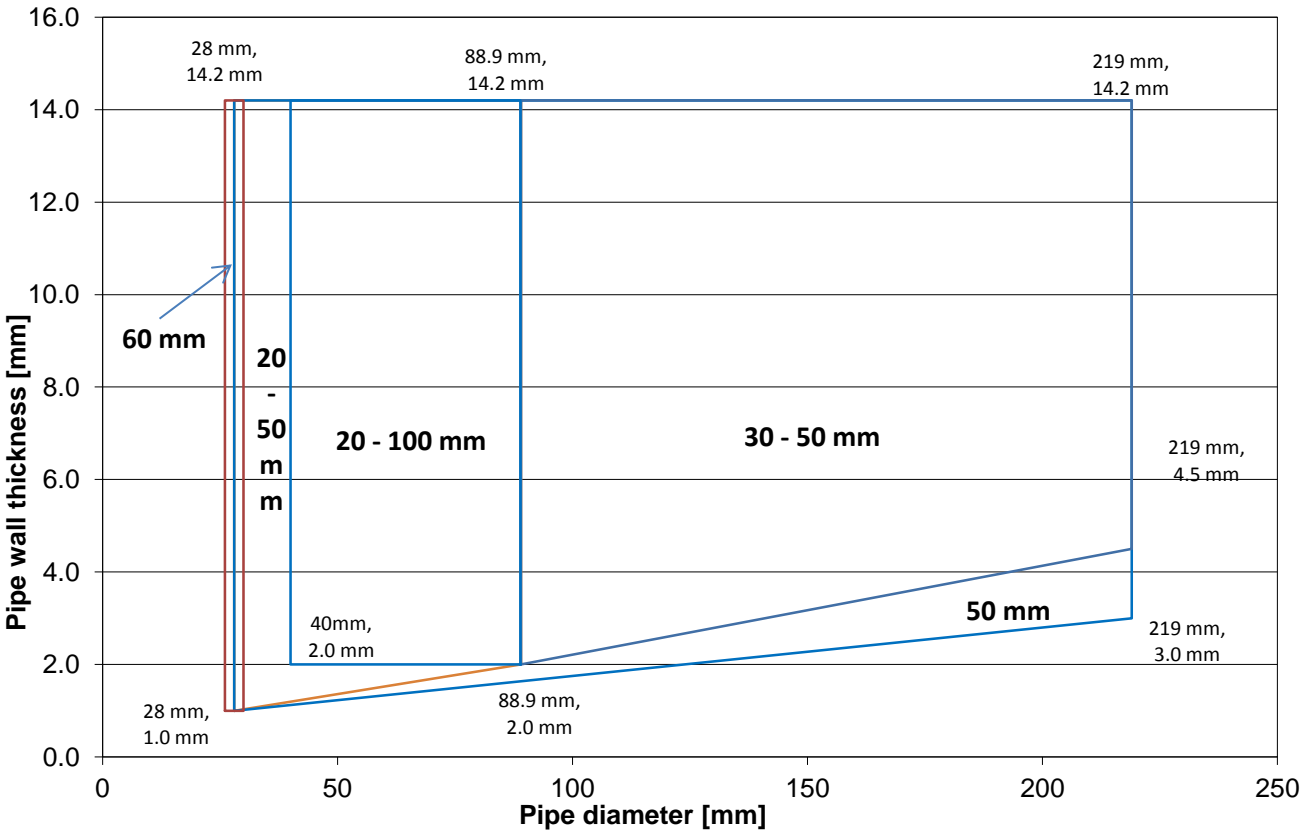


EI 90 - Horizontal pipe direction
 U Protect Pipe Section Alu2
 Local, Sustained insulation
 Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Steel, Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

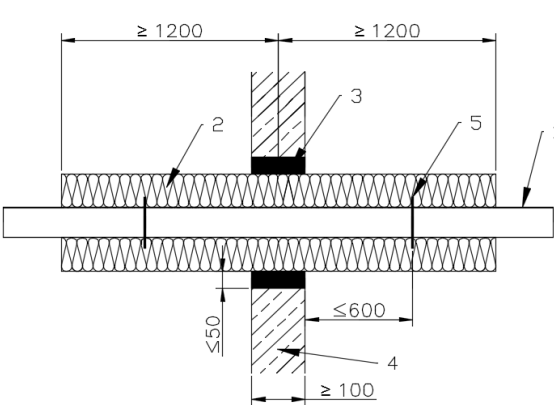


El 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

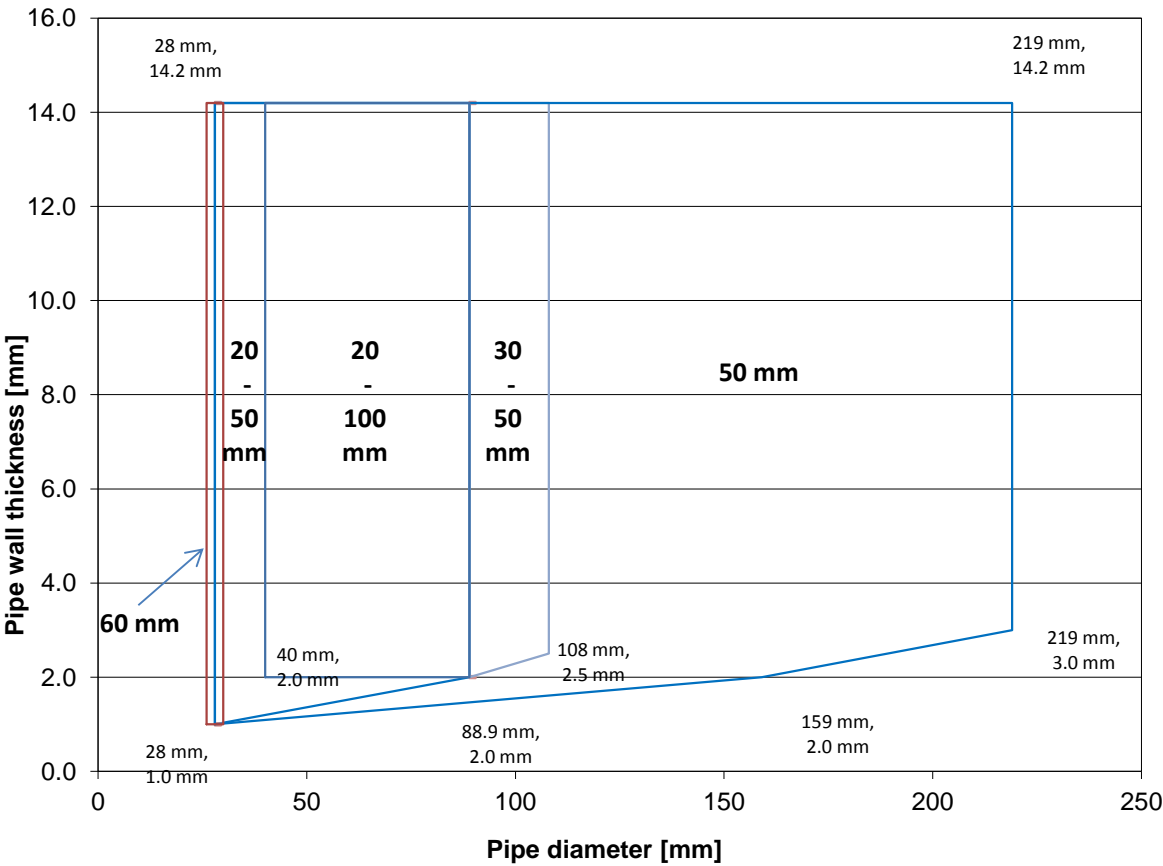
Local, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation



EI 90 - Horizontal pipe direction

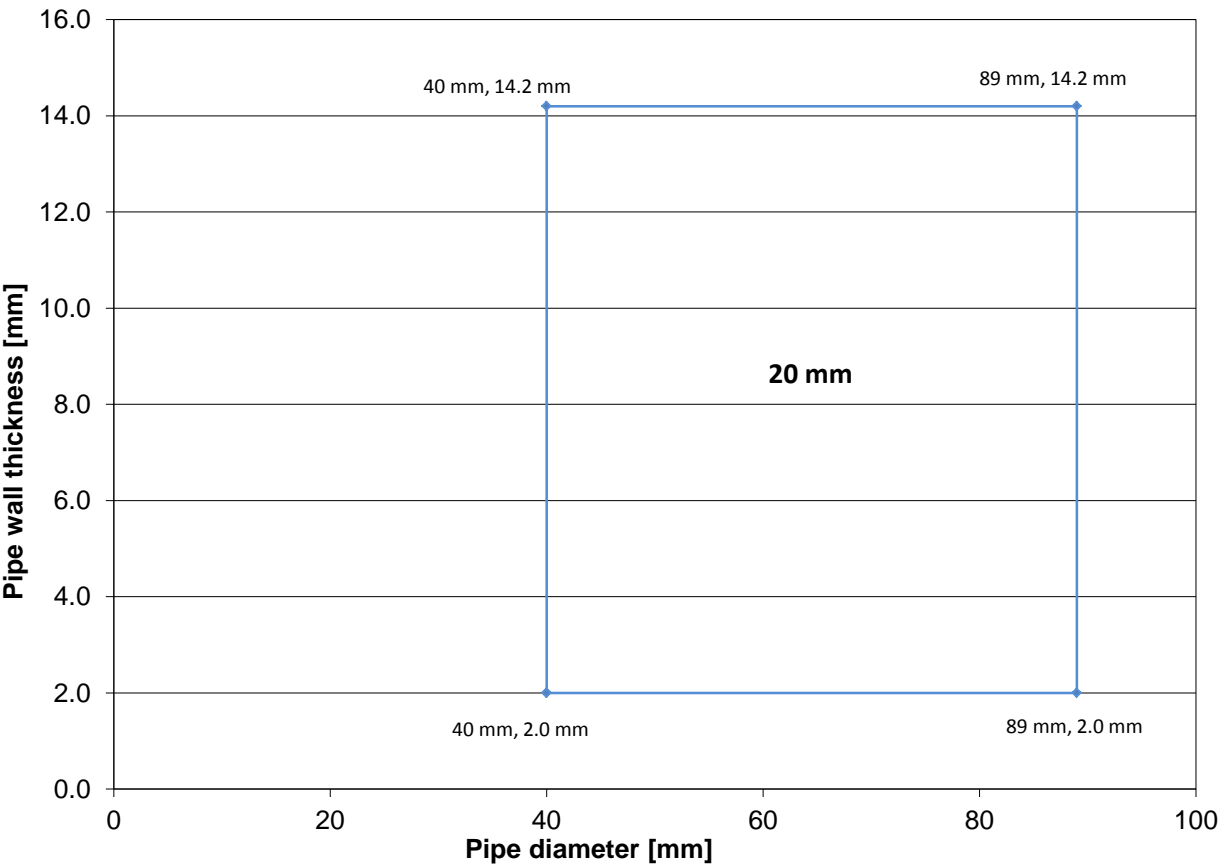
U Protect Pipe Section Alu2

Local, Interrupted insulation

Copper, Cast iron, Steel and Stainless steel pipes

No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

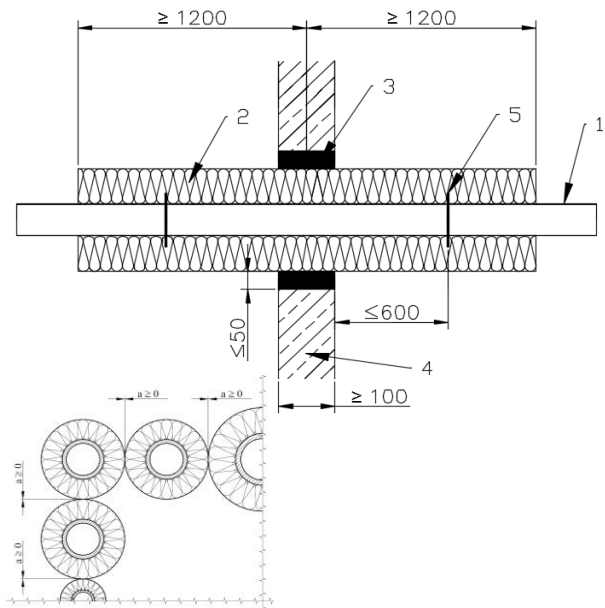


EI 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, Cluster arrangement

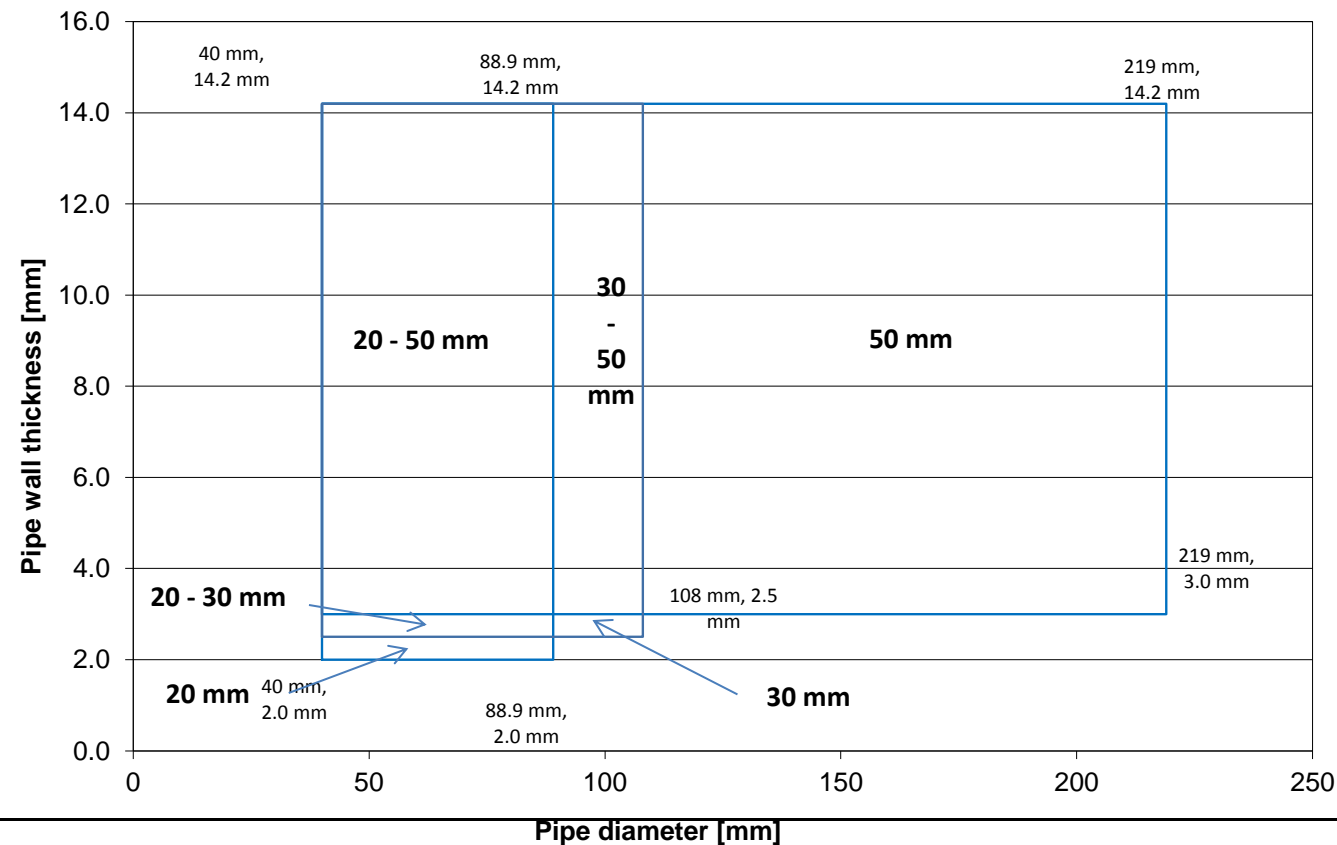
Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB. For continued insulation the thickness of the insulation can be increased

Field of application for insulation thickness

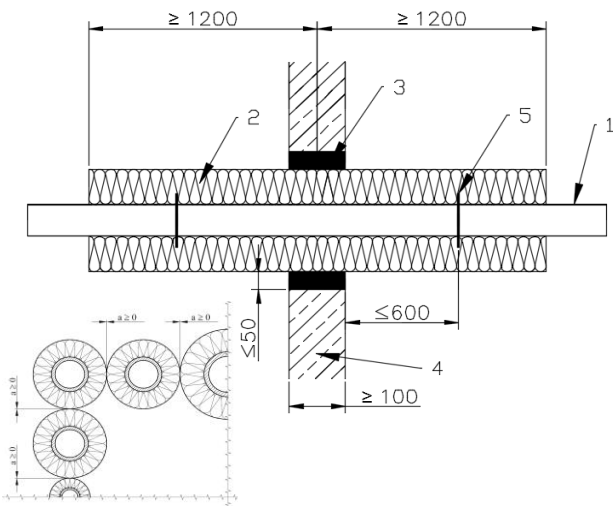


El 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, Cluster arrangement

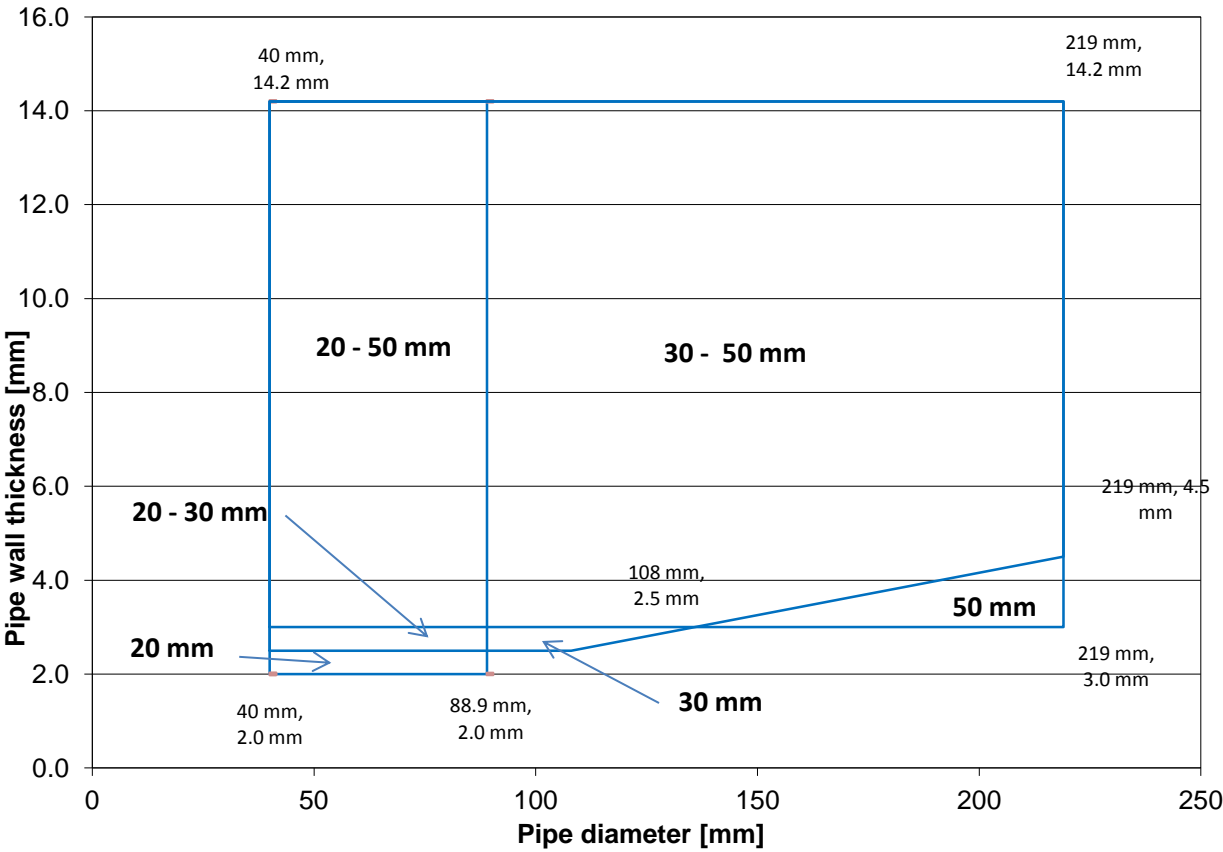
Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with mortar or concrete
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB. For continued insulation the thickness of the insulation can be increased

Field of application for insulation

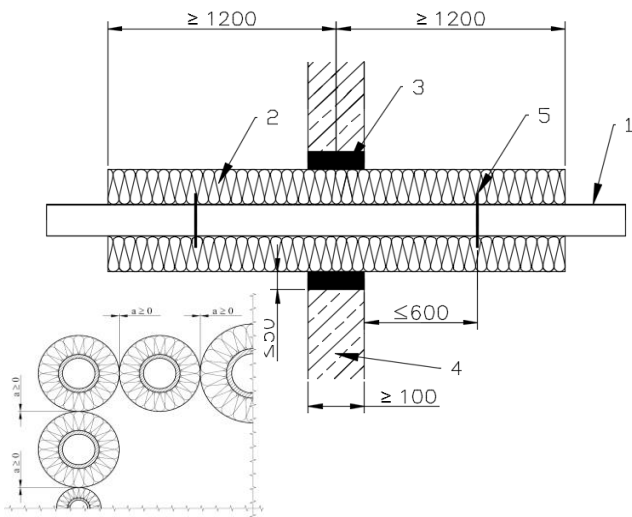


El 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, Cluster arrangement

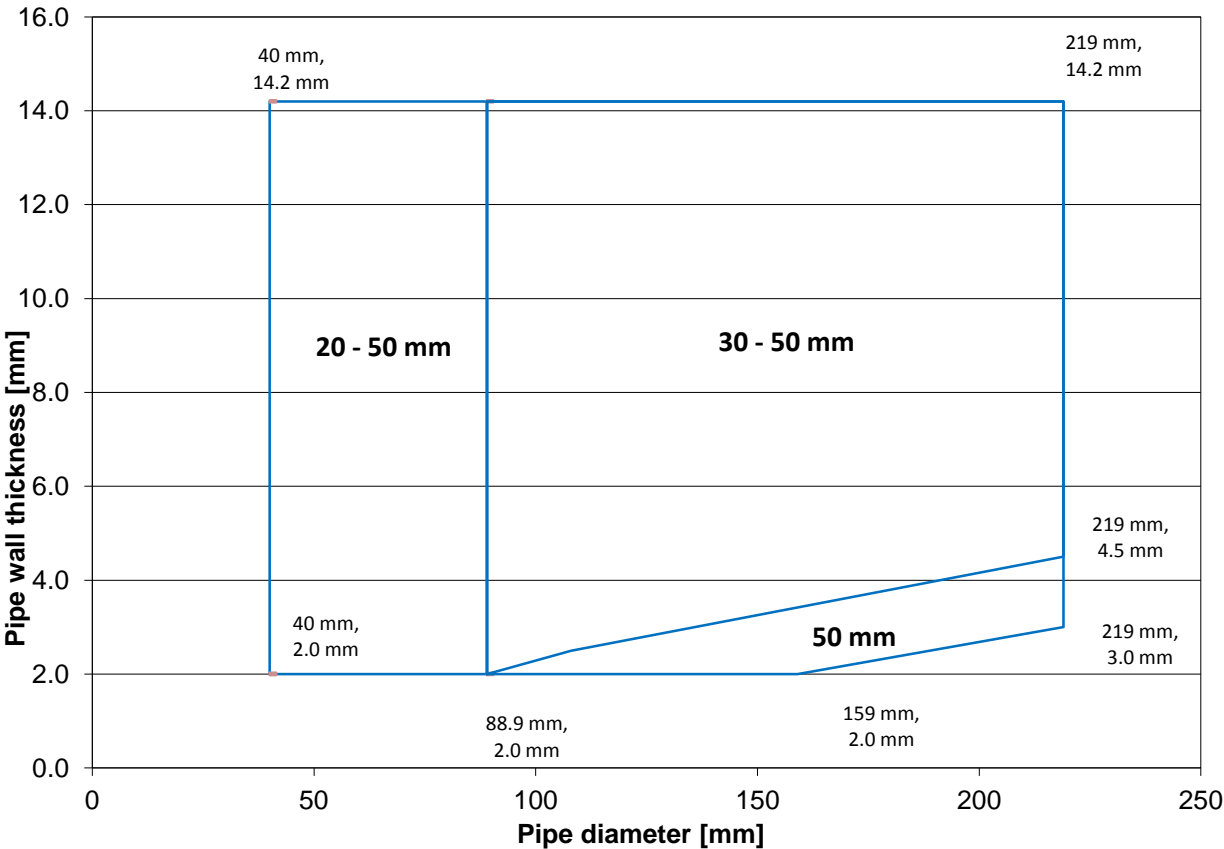
Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with mortar or concrete
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB. For continued insulation the thickness of the insulation can be increased

Field of application for insulation

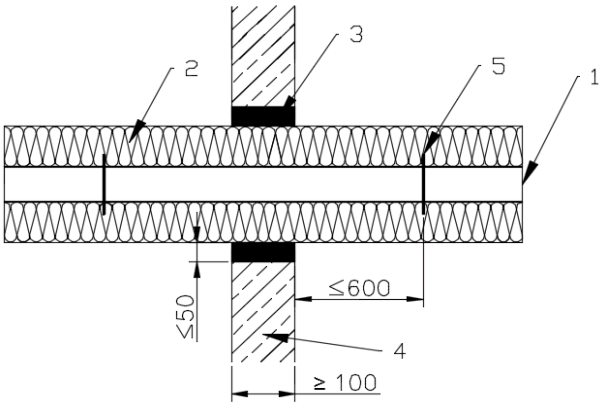


El 90 - Horizontal pipe direction

U Protect Pipe Section Alu2

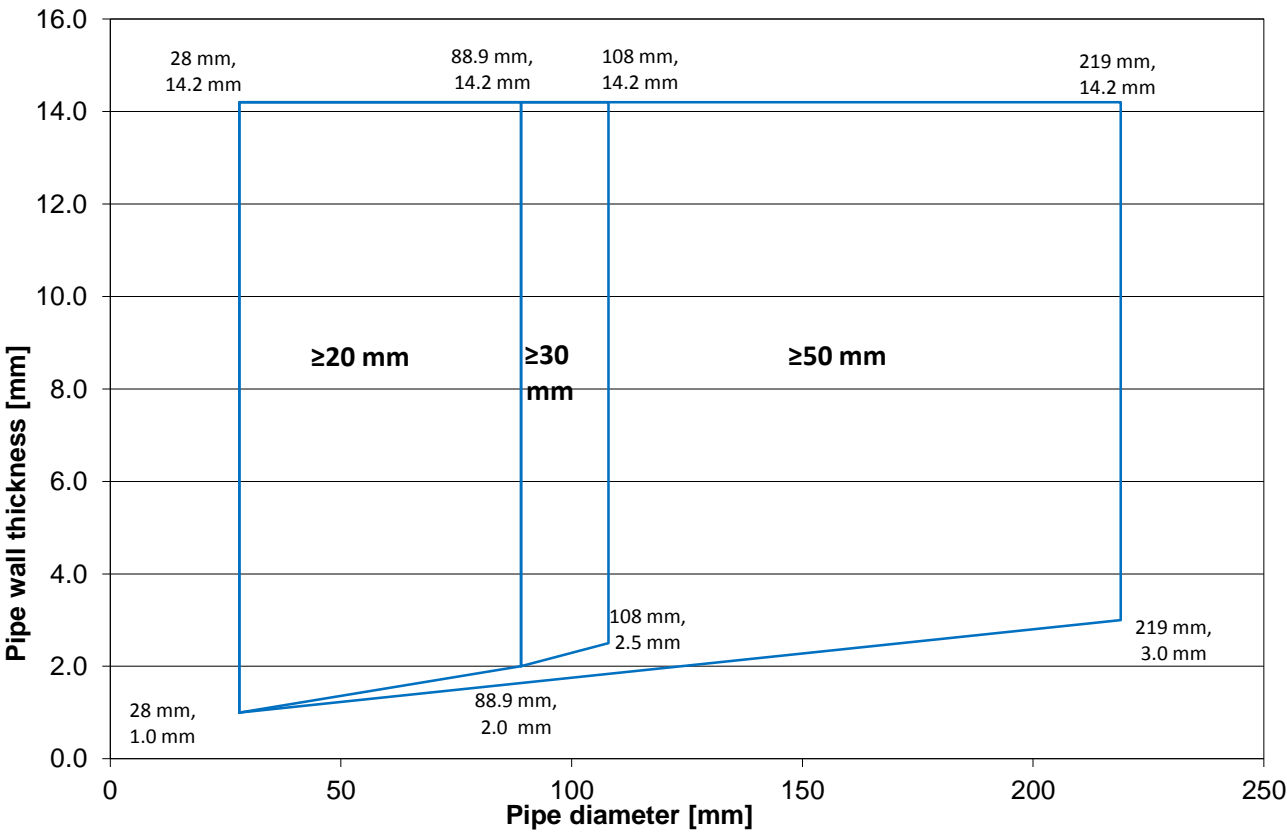
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes

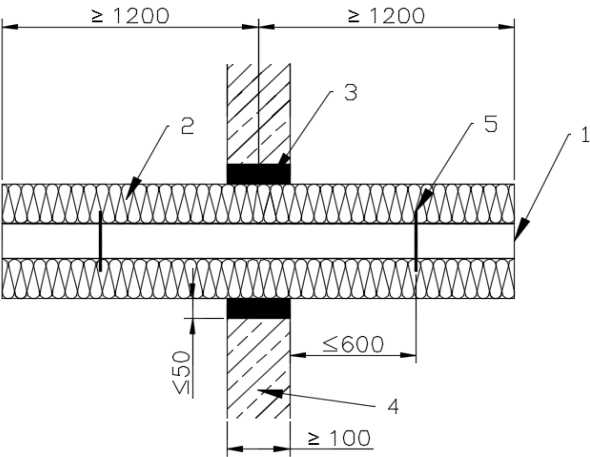


No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

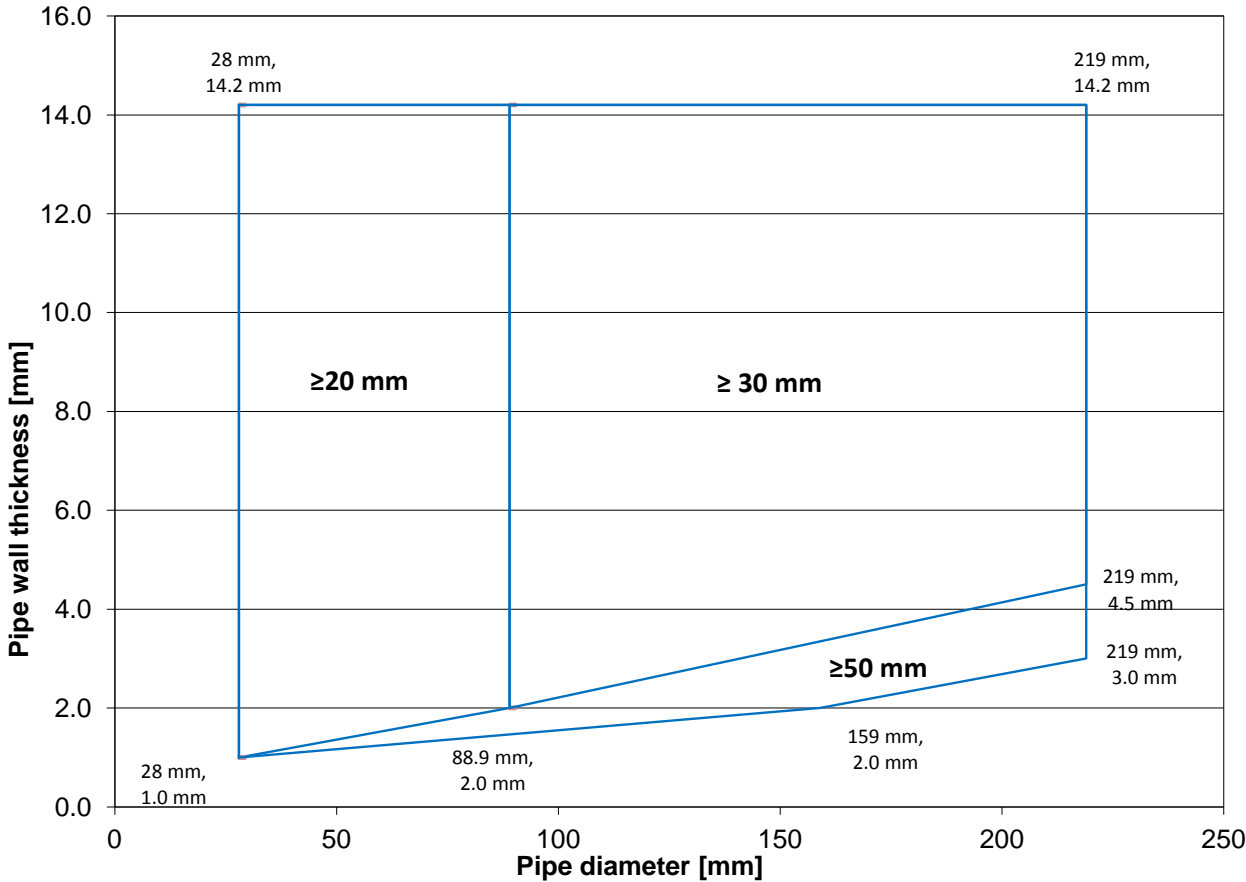


EI 90 - Horizontal pipe direction
 U Protect Pipe Section Alu2
 Continued, sustained insulation
 Steel, Stainless steel pipes



No.	Item	Description
1	Pipe	Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with mortar, concrete or gypsum
4	Wall	Flexible board wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation

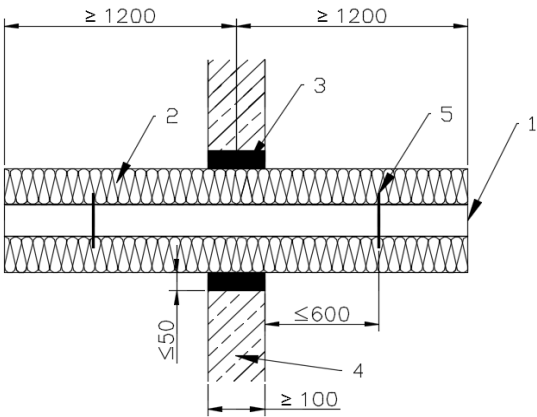


EI 90 - Horizontal pipe direction

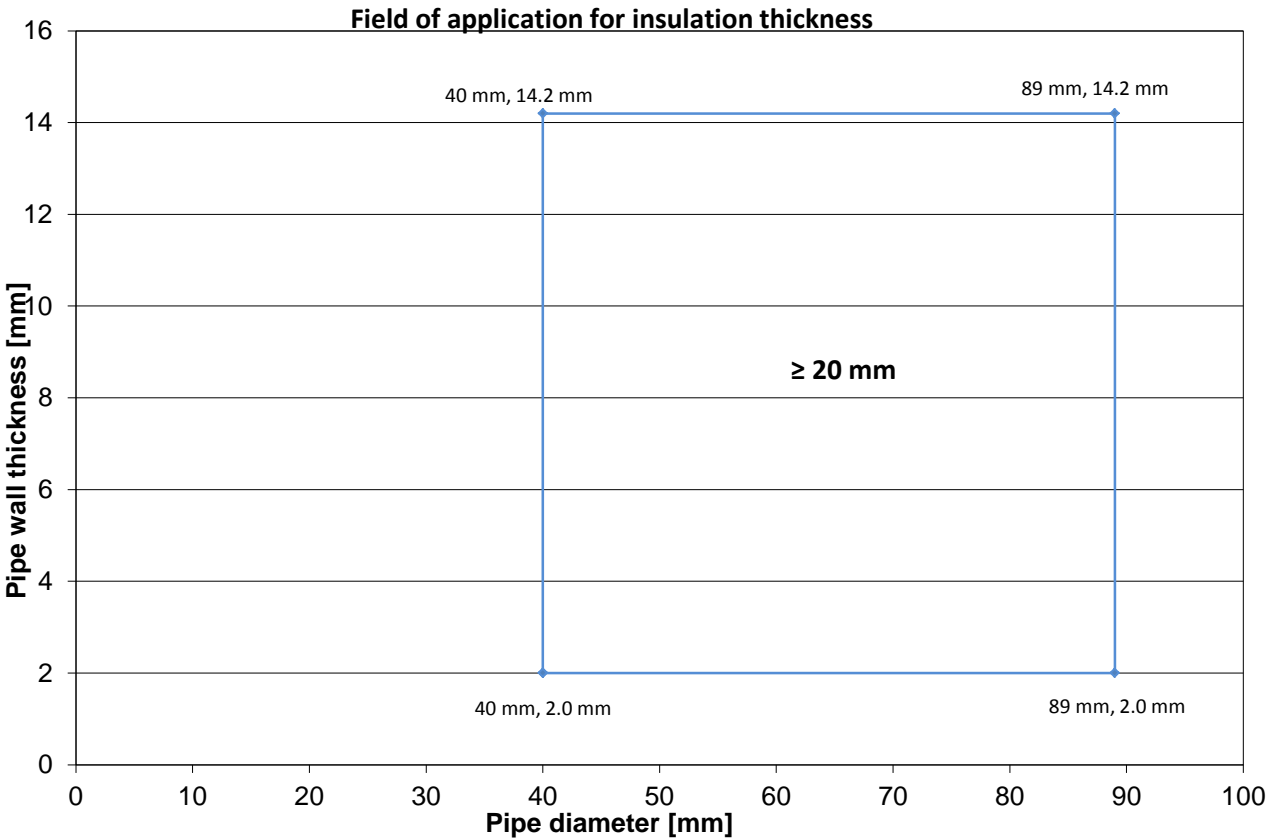
U Protect Pipe Section Alu2

Continued, Interrupted insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support Metal hanger	

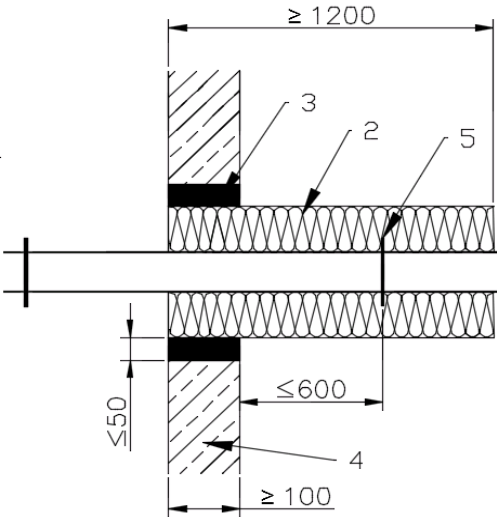


EI 30 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained asymmetrical insulation

Copper, Cast iron, Steel and Stainless steel pipes

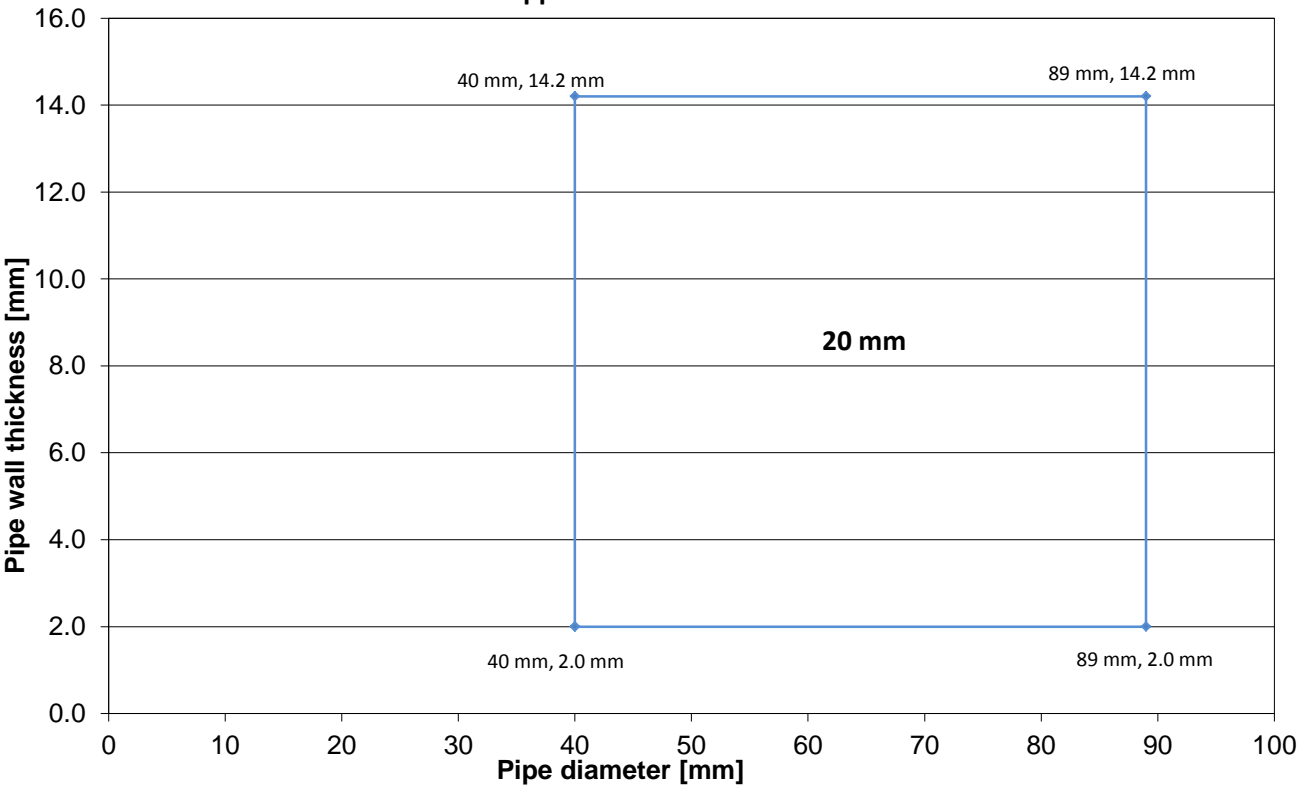


No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Pipe Section Alu2 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

NB: Classification only valid for fire from the insulation side.

NB. For continued insulation the thickness of the insulation can be increased

Field of application for insulation thickness

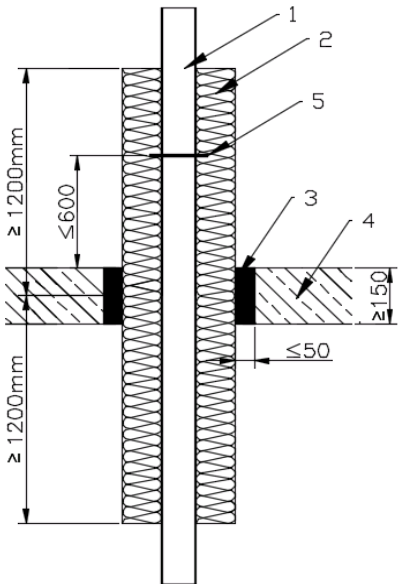


EI 120 - Vertical pipe direction

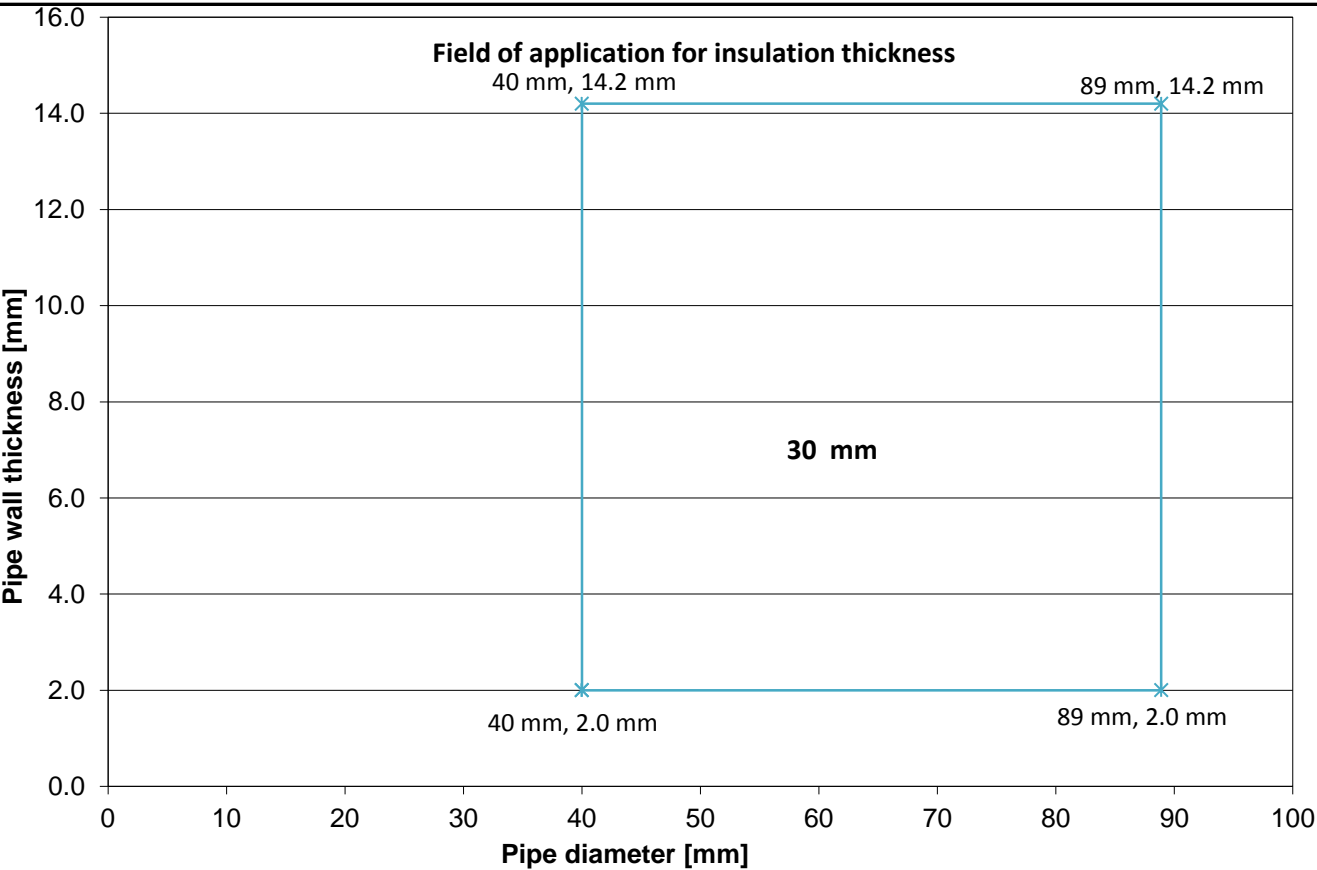
U Protect Roll 3.1 Alu1

Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

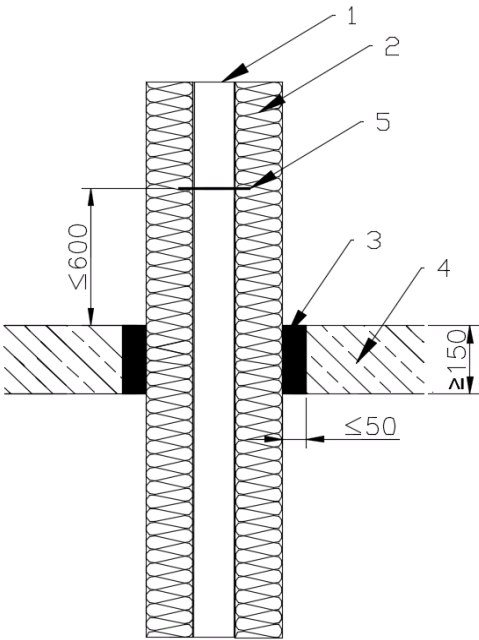


EI 120 - Vertical pipe direction

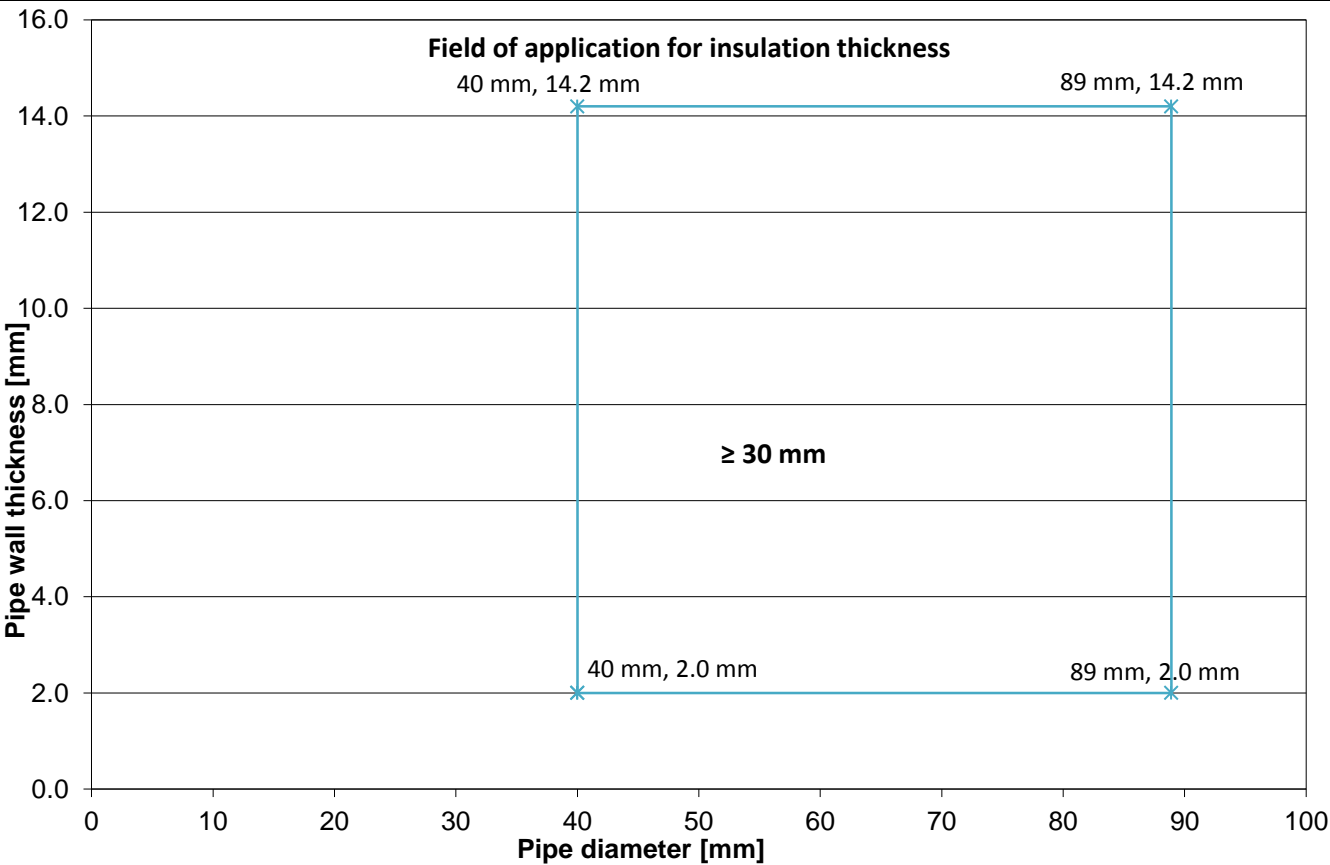
U Protect Roll 3.1 Alu1

Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel, Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

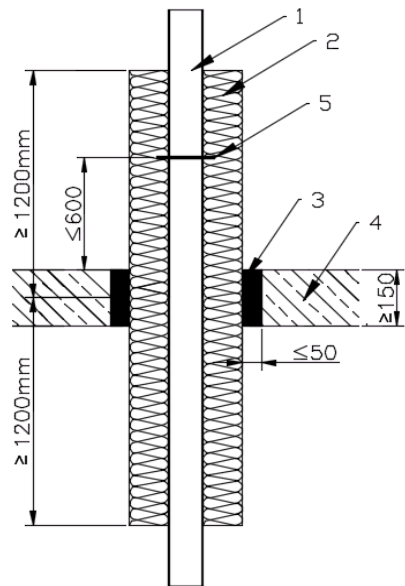


El 90 - Vertical pipe direction

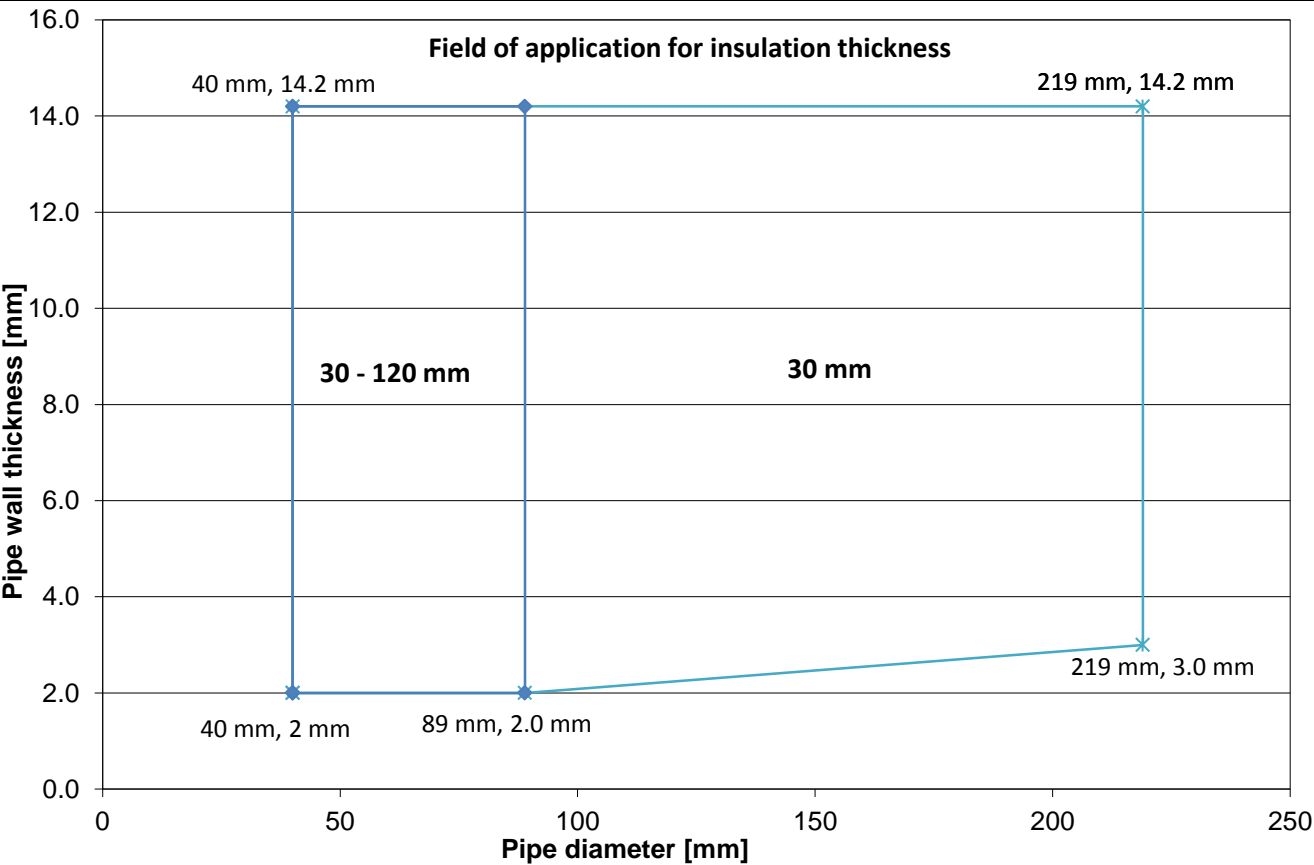
U Protect Roll 3.1 Alu1

Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

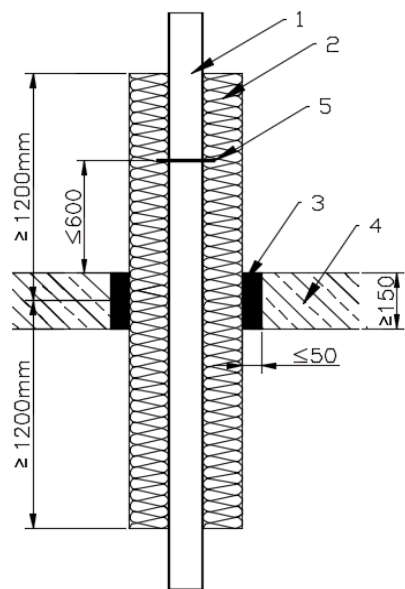


El 90 - Vertical pipe direction

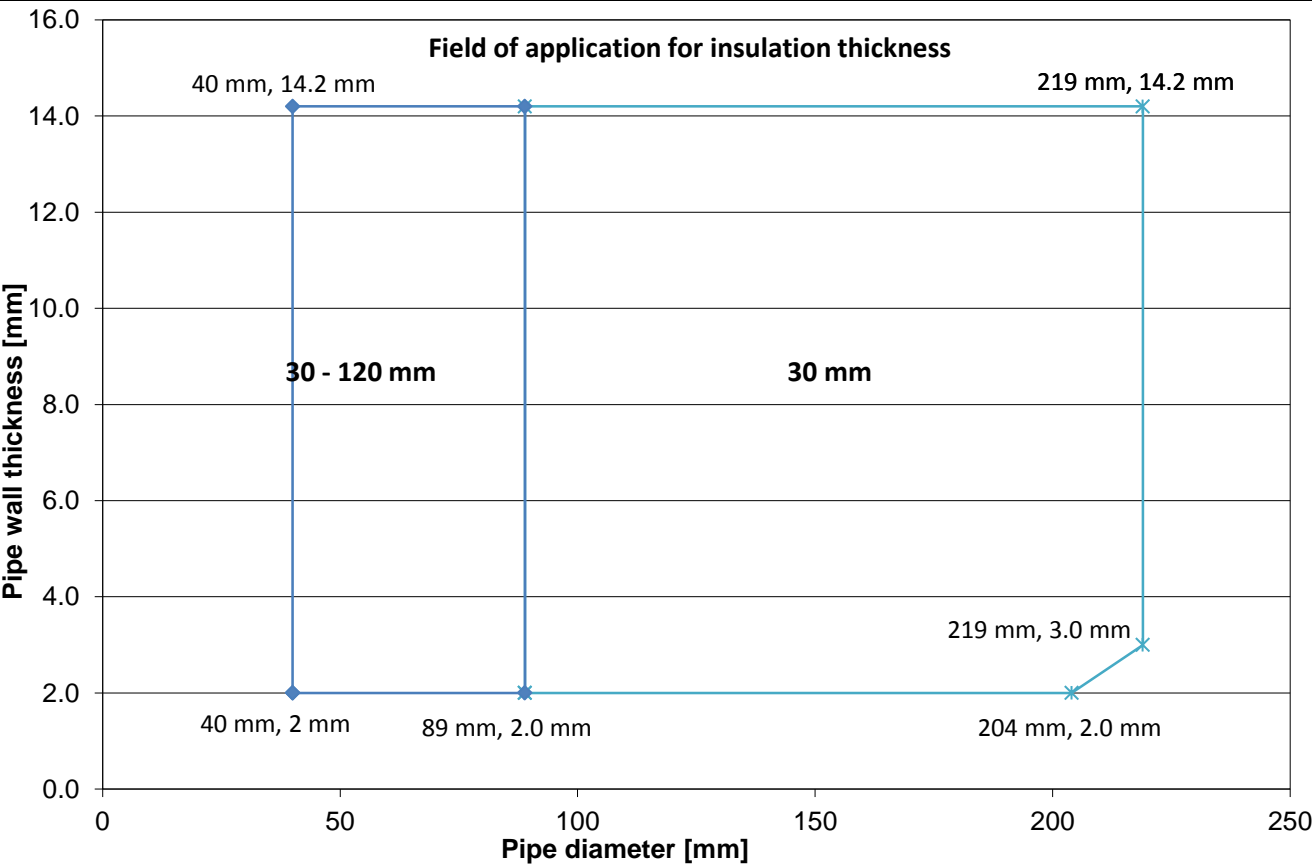
U Protect Roll 3.1 Alu1

Local, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

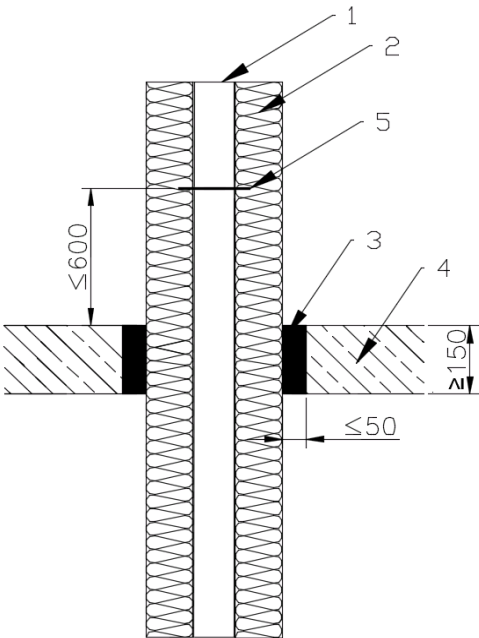


El 90 - Vertical pipe direction

U Protect Roll 3.1 Alu1

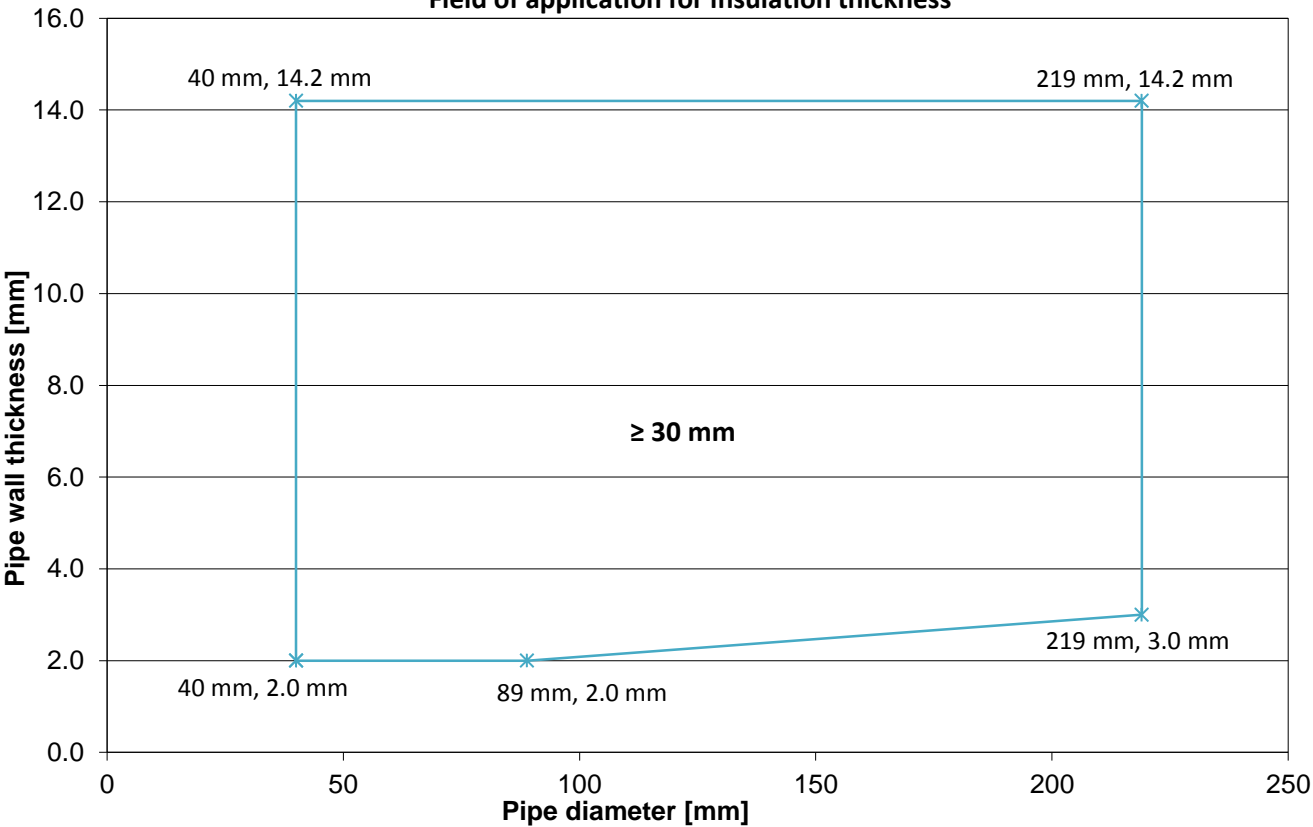
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

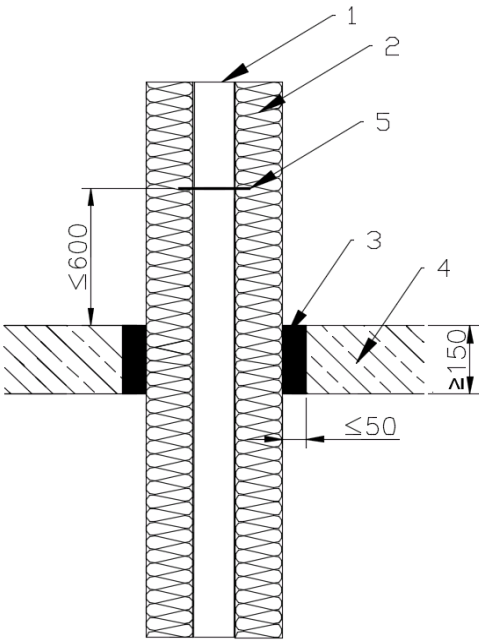


El 90 - Vertical pipe direction

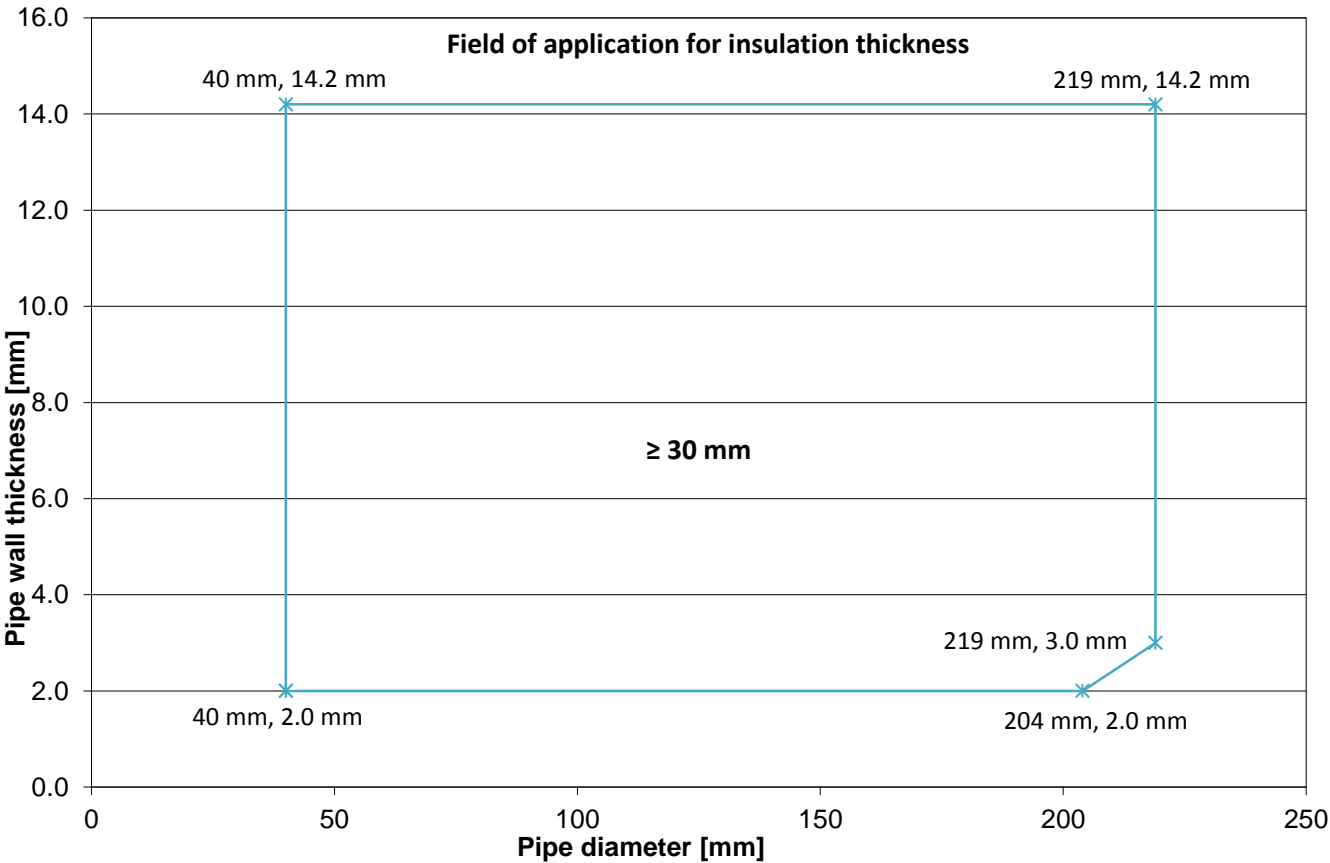
U Protect Roll 3.1 Alu1

Continued, Sustained insulation

Stainless steel pipes



No.	Item	Description
1	Pipe	Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar or Concrete
4	Ceiling	Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

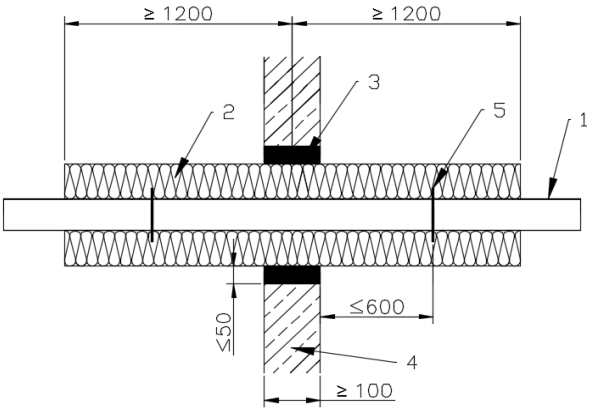


El 90 - Horizontal pipe direction

U Protect Roll 3.1 Alu1

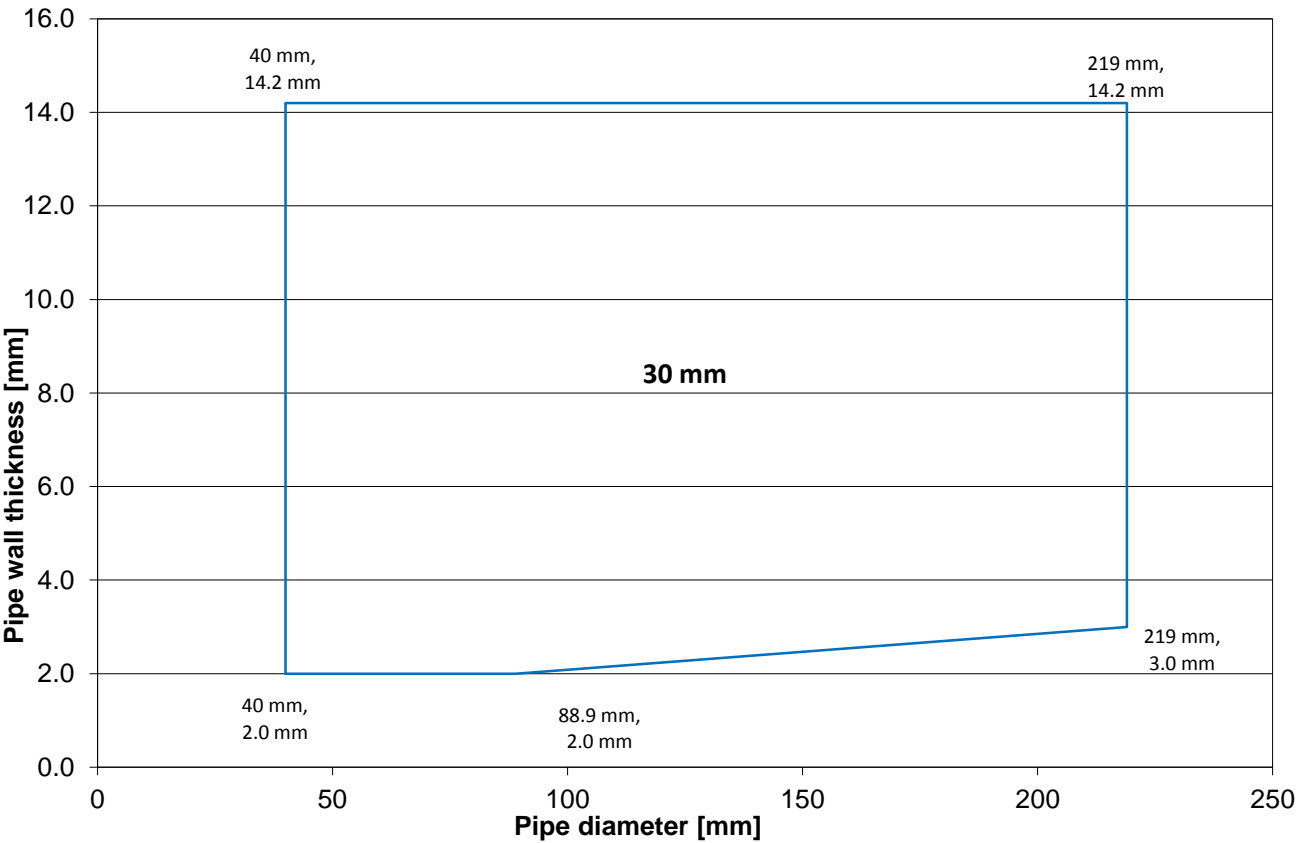
Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

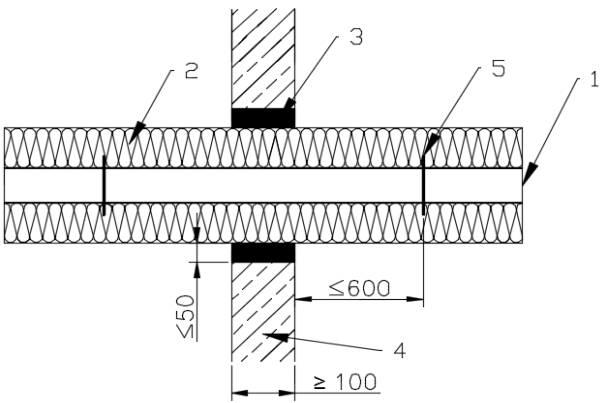


El 90 - Horizontal pipe direction

U Protect Roll 3.1 Alu1

Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel pipes



No.	Item	Description
1	Pipe	Copper, Cast iron, Steel and Stainless steel
2	Insulation	U Protect Roll 3.1 Alu1 fixed with steel wire c/c 250 mm
3	Residual gap	Filled with Mortar, Concrete or Gypsum
4	Wall	Flexible wall or Aerated concrete, Concrete or Masonry
5	Service support	Metal hanger

Field of application for insulation thickness

