



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 sealing metal pipe penetrations
File no.: PCA10437A **Revision:** 2
Date: 17-12-2019
Pages: 14 **Encl.:** 56
Ref: ADR / JBK

Client information

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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.

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 60-C/U, EI 60-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 fall down of the supporting system 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
See also Annex C.

Reaction to fire classification A2_L-s1,d0

The variations in the application of the insulation (e.g. thickness and length) are shown in the annexes

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 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 the annexes.

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 $w \times t = 16 \text{ mm} \times 0.4 \text{ mm}$. 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 Type 1 Standard

Aperture: The distance from the surface of the pipe and the supporting construction shall be up to 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.

Penetration Type 2 additional solution for small gap sizes

The additional solution for small gap sizes is valid for the configuration shown on Annex H1N and V1H

Aperture: The distance from the surface of the pipe section and the supporting construction shall be up to 15 mm for walls and up to 25 mm for floors.

Sealing material: The aperture in can be filled with a sealant/mastic: Protect BSK, PROMASEAL-Mastic, SIBRALIT DX or Pyro-Safe Flammoplast KS3 in a depth of $\geq 25\text{mm}$ from both sides.
In between the fillings can be a void or a material of Euroclass E according EN 13501-1 or better.

Penetration Type 3 additional solution for large gap sizes

The additional solution for large gap sizes is valid for the configuration shown on Annex H1O and V1S

Aperture: The distance from the surface of the pipe section and the supporting construction shall be up to 100 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.

Penetration Type 4 additional solution for seals with sound insulation in floors

The additional solution sealing with sound insulation configuration shown on Annex V1I and V1J

Aperture: The distance from the surface of the pipe and the supporting construction shall be up to 50 mm.

Sealing material: The aperture in floors can be filled with: mortar or concrete.
With or without sound insulation of:
5mm Steinoflex 305R PE sound insulation strip, in full sealing thickness.
3.5mm Self-adhesive felt stripes in full sealing thickness.
Sleeve type BSM-S 89, 250 mm.

Penetration Type 5 additional solution for seals with sound insulation in walls

The additional solution sealing with sound insulation configuration shown on Annex H1K, H1L.

Aperture: The distance from the surface of the pipe and the supporting construction shall be up to 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.

With or without sound insulation of:

5mm Steinoflex 305R PE sound insulation strip, in full sealing thickness.

3.5mm Self-adhesive felt stripes in full sealing thickness.

Sleeve type BSM-S 89, 250 mm.

Penetration Type 6 additional solution with precast pp-pipe in penetration.

The additional solution sealing with pp-pipe in penetration configuration shown on Annex V1U

Aperture: The distance from the surface of the pipe and the supporting construction shall be up to 50 mm.

Sealing material: A 110 mm "PP" pipe is cast into the floor flush with the floor on both sides.

The aperture in between the PP-Pipe and the insulation can be filled with: mortar or concrete.

Penetration Type 7 additional solution with compressed insulation in penetration.

The additional solution sealing with compressed insulation in penetration shown on Annex V1V –V1X

Aperture: The distance from the surface of the pipe and the supporting construction shall be up to 50 mm.

Sealing material: Loose stone wool compressed to a density of 120 kg/m³

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 table shown on Annex B.

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 30-C/C, EI 60-C/U, EI 60-C/C, EI 90-C/U, EI 90-C/C, EI 120-C/U and EI 120-C/C**

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

Annexes for U Protect Pipe Section Alu2 - Vertical

| Annex | Classification | Orientation | Pipe | Minimum length of insulation | Configuration | Pipe arrangement |
|-------|----------------|-----------------|------------------------------|------------------------------|------------------------------|------------------|
| V1A | EI 120 | Vertical pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| V1B | EI 120 | Vertical pipes | Stainless steel | 2x1200 mm | LS | Single pipe |
| V1C | EI 120 | Vertical pipes, | All metal pipes as specified | 2x1200 mm | LS & CS | Cluster |
| V1D | EI 120 | Vertical pipes | Steel, Stainless steel | 2x1200 mm | LS & CS | Cluster |
| V1E | EI 120 | Vertical pipes | All metal pipes as specified | 2x600 mm | LS & CS | Single pipe |
| V1F | EI 120 | Vertical pipes | All metal pipes as specified | Continued | CS | Single pipe |
| V1G | EI 120 | Vertical pipes | Stainless steel | Continued | CS | Single pipe |
| V1H | EI120 | Vertical pipes | All metal pipes as specified | 2x600 mm | LS & CS Small gap filling | Single pipe |
| V1I | EI 120 | Vertical pipes | All metal pipes as specified | 2x 600 mm | LI | Single pipe |
| V1J | EI 120 | Vertical pipes | All metal pipes as specified | Continued | CI | Single pipe |
| V1K | EI 120 | Vertical pipes | All metal pipes as specified | 1200 mm asymmetrical | LS | Single pipe |
| V1L | EI 120 | Vertical pipes | All metal pipes as specified | Continued asymmetrical | CS | Single pipe |
| V1M | EI 90 | Vertical pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| V1N | EI 90 | Vertical pipes | Stainless steel | 2x1200 mm | LS | Single pipe |
| V1O | EI 90 | Vertical pipes, | All metal pipes as specified | 2x1200 mm | LS & CS | Cluster |
| V1P | EI 90 | Vertical pipes, | Stainless steel | 2x1200 mm | LS & CS | Cluster |
| V1Q | EI 90 | Vertical pipes | All metal pipes as specified | Continued | CS | Single pipe |
| V1R | EI 90 | Vertical pipes | Stainless steel | Continued | CS | Single pipe |

| | | | | | | |
|--------------|-----------------------|--------------------|------------------------------|-------------------------------------|--------------------------------|-------------------------|
| V1S | EI 90 | Vertical pipes | All pipes as specified | 2x1200 mm | LS & CS 100 mm residual gap | Single pipe |
| V1T | EI 90 | Vertical pipes | Stainless steel | Continued | CS | Single pipe |
| V1U | EI 90 | Vertical pipes | All metal pipes as specified | 2x 600 mm | LI & CI | Single pipe |
| Annex | Classification | Orientation | Pipe | Minimum length of insulation | Configuration | Pipe arrangement |
| V1V | EI 60 | Vertical pipes | Stainless steel | 2x1200 mm | LS & CS | Single pipe |
| V1X | EI 30 | Vertical pipes | All metal pipes as specified | 1200 mm asymmetrical | LS & CS | Cluster |

Annexes for U Protect Pipe Section Alu2 - Horizontal

| Annex | Classification | Orientation | Pipe | Minimum length of insulation | Configuration | Pipe arrangement |
|--------------|-----------------------|--------------------|------------------------------|-------------------------------------|--------------------------------|-------------------------|
| H1A | EI 120 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| H1B | EI 120 | Horizontal pipes | Stainless steel | 2x1200 mm | LS & CS | Single pipe |
| H1C | EI 120 | Horizontal pipes | All metal pipes as specified | Continued | CS | Single pipe |
| H1D | EI 90 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| H1E | EI 90 | Horizontal pipes | Steel, Stainless steel | 2x1200 mm | LS | Single pipe |
| H1F | EI 90 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS & CS | Cluster |
| H1G | EI 90 | Horizontal pipes | Steel, Stainless steel | 2x1200 mm | LS & CS | Cluster |
| H1H | EI 90 | Horizontal pipes | Stainless steel | 2x1200 mm | LS & CS | Cluster |
| H1I | EI 90 | Horizontal pipes | All metal pipes as specified | Continued | CS | Single pipe |
| H1J | EI 90 | Horizontal pipes | Steel, Stainless steel | Continued | CS | Single pipe |
| H1K | EI 90 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LI | Single pipe |
| H1L | EI 90 | Horizontal pipes | All metal pipes as specified | Continued | CI | Single pipe |
| H1M | EI 30 | Horizontal pipes | All metal pipes as specified | 1200 mm asymmetrical | LS & CS | Single pipe |
| H1N | EI90 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS & CS Small gap filling | Single pipe |
| H1O | EI120 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS & CS 100 mm residual gap | Single pipe |
| H1P | EI60 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS & CS Loose stone wool | Single pipe |

Annexes for U Protect Roll 3.1 Alu1

| Annex | Classification | Orientation | Pipe | Minimum length of insulation | Configuration | Pipe arrangement |
|-------|----------------|------------------|------------------------------|------------------------------|---------------|------------------|
| V2A | EI 120 | Vertical pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| V2B | EI 120 | Vertical pipes | All metal pipes as specified | Continued | CS | Single pipe |
| V2C | EI 60 | Vertical pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| V2D | EI 60 | Vertical pipes | Stainless steel | 2x1200 mm | LS | Single pipe |
| V2E | EI 120 | Vertical pipes | Stainless steel | Continued | CS | Single pipe |
| V2F | EI 30 | Vertical pipes | Stainless steel | 2x1200 mm | LS & CS | Single pipe |
| V2G | EI 90 | Vertical pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| V2H | EI 90 | Vertical pipes | Stainless steel | 2x1200 mm | LS | Single pipe |
| V2I | EI 90 | Vertical pipes | All metal pipes as specified | Continued | CS | Single pipe |
| V2J | EI 90 | Vertical pipes | Stainless steel | Continued | CS | Single pipe |
| | | | | | | |
| H2A | EI 90 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS | Single pipe |
| H2B | EI 90 | Horizontal pipes | All metal pipes as specified | Continued | CS | Single pipe |
| H2C | EI 60 | Horizontal pipes | All metal pipes as specified | 2x1200 mm | LS & CS | Single pipe |
| H2D | EI 60 | Horizontal pipes | Stainless steel | 2x1200 mm | LS & CS | Single pipe |
| H2E | EI 60 | Horizontal pipes | Stainless steel | Continued | CS | Single pipe |
| H2F | EI 30 | Horizontal pipes | Stainless steel | 2x1200 mm | LS & CS | Single pipe |

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)

Resistance to fire classification of minimum EI 60 for penetrations classified EI 60
minimum density 475 kg/m³ (§13.2.1)
minimum thickness of 94 mm. (§13.2.1)

Resistance to fire classification of minimum EI 90 for penetrations classified EI 90
minimum density 475 kg/m³ (§13.2.1)
minimum thickness of 94 mm. (§13.2.1)

Resistance to fire classification of minimum EI 120 for penetrations classified EI 120
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 60 for penetrations classified EI 60
Minimum thickness of 94 mm. (§13.2.2.1 2)
Minimum two board layers on each side (§13.2.2.1 3)
The overall board thickness is 50 mm or greater.

Resistance to fire classification of minimum EI 90 for penetrations classified EI 90
Minimum thickness of 94 mm. (§13.2.2.1 2)
Minimum two board layers on each side (§13.2.2.1 3)
The overall board thickness is 50 mm or greater.

Resistance to fire classification of minimum EI 120 for penetrations classified EI 120
Minimum thickness of 100 mm. (§13.2.2.1 2)
Minimum two board layers on each side (§13.2.2.1 3)
The overall board thickness is 50 mm or greater.

For penetration through flexible walls with timber studs (§13.2.2.1, 5)

Constructed as described for wall with steel studs, but with no part of the penetration closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud, and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

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

Note: For processability/workability the preferably gap should be minimum 10 mm.

Sealing medium inside aperture:

For rigid constructions the aperture can be filled with:

Mortar

According to EN 15882-3 Mortar is defined as blend of gypsum or cement based powder, fillers, water and chemical modifiers, with or without reinforcement

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 tables listed in this report.

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 or alloys with a higher melting point and lower thermal conductivity than copper.

The pipes can be coated provided the overall classification is minimum A2 according to EN 13501-1.

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

Single pipes penetration seal systems:

Single pipe penetration seal systems have only one pipe per aperture.

Single pipe systems should have a separation distance of ≥ 100 mm. The separation distance between the pipes shall be measured from the outer edges of pipes or secondary parts of the penetration seal, as relevant. In this case the outer surface of the pipe insulation.

Multiple pipe penetration seal systems:

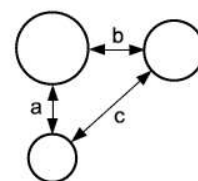
Multiple pipe penetration seal systems (cluster configuration) can have multiple pipes through one aperture.

The pipe can be of any type material as long as this pipe type is also classified for Multiple pipe penetration seal systems.

The multiple pipe systems can be classified for linear arrangement or cluster arrangement. The separation distances a, b and c are the distance measured from the outer edges of pipes or secondary parts of the penetration seal, as relevant. In this case the outer surface of the pipe insulation.



Linear arrangement



Cluster arrangement

The separation distance for multiple penetration seal systems should be minimum:

- a and b \geq 0 mm
- c \geq 22 mm

Multiple pipe penetration systems classified for linear arrangement (see annex table above) can be installed as single pipe systems and multiple pipe systems in linear configuration.

Multiple pipe systems classified for cluster arrangement (see annex table above) can be installed as single pipe systems and multiple pipe systems in both linear and cluster configurations.

A cluster or linear configuration can consist of services made from different materials eg. metal and plastic pipes together, on condition that all the service types have been tested in the that configuration.

Note: classification of plastic pipes is given in classification report PCA10524A.

The pipes can be positioned next to pipes with a penetration seal consisting of a pipe collar of one of the following types:

| Producer | Product name | Approval |
|-----------|--------------------------|---------------------------------|
| Doyma | Curafam® System XS Pro; | AbZ Z-19.53-2182 ETA-11/0498 |
| Firentis | FS-M R1 | AbZ Z-19.53-2182 ETA-11/0498 |
| Doyma | Curafam® System ECO Pro; | ABZ Z-19.17-1089 |
| Firentis | FS-M R2 | ABZ Z-19.17-1089 |
| Rolf Kuhn | System FSC | ABZ Z-19.17-1089 |
| Conel | Flam Manschette | ABZ Z-19.17-1986 |
| Wavin | System BM-R90 | AbZ Z-19.17-1924 |
| Poloplast | System POLO-BSM F | AbZ Z-19.17-1923 |

Insulation:

The thickness range of the insulation is shown on the annexes.

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 the annex tables listed in this report but not reduced.

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

Limitations

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

Danish Institute of Fire and Security Technology



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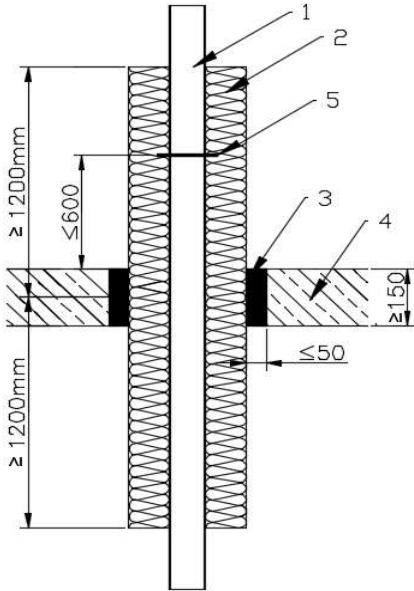


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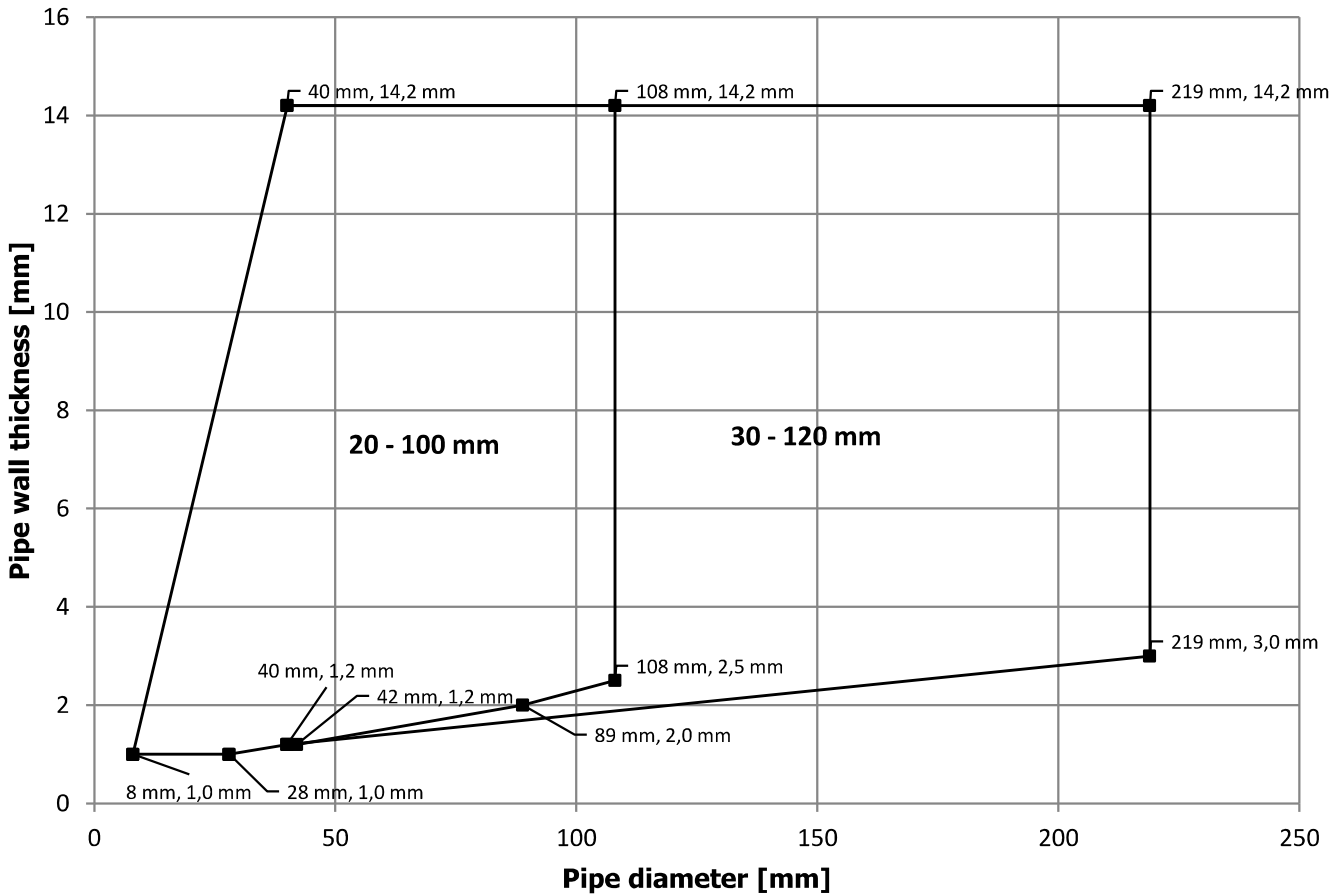
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EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

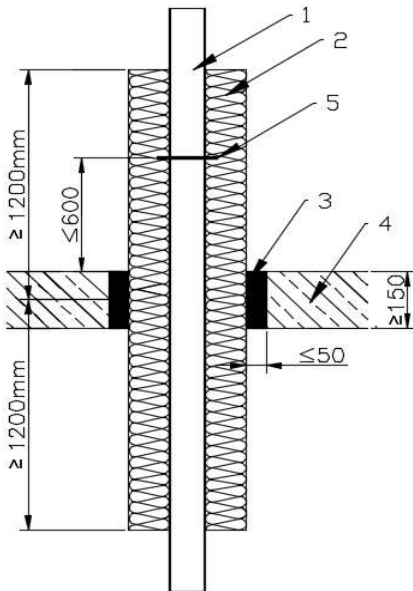


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

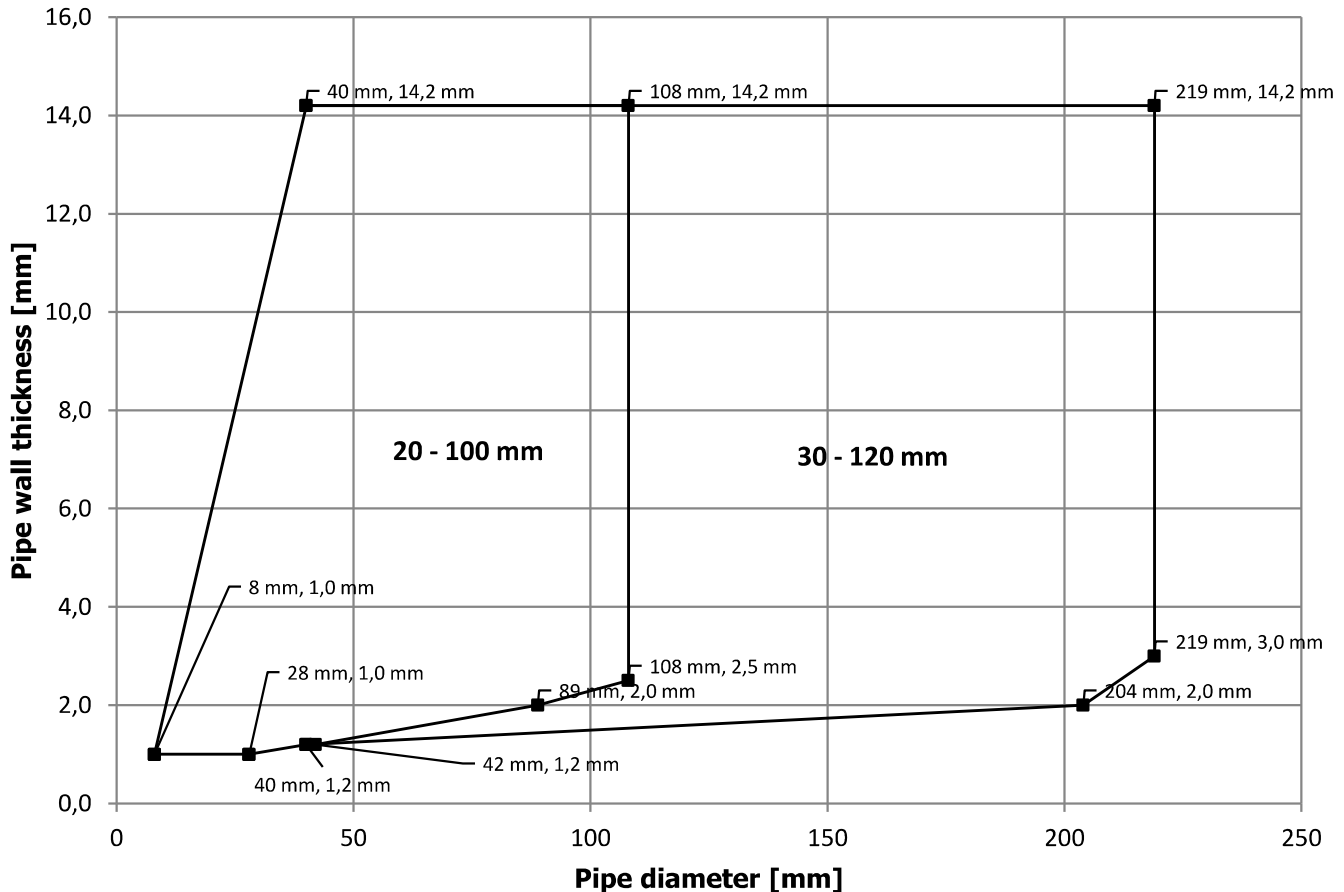


**EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Stainless steel**



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

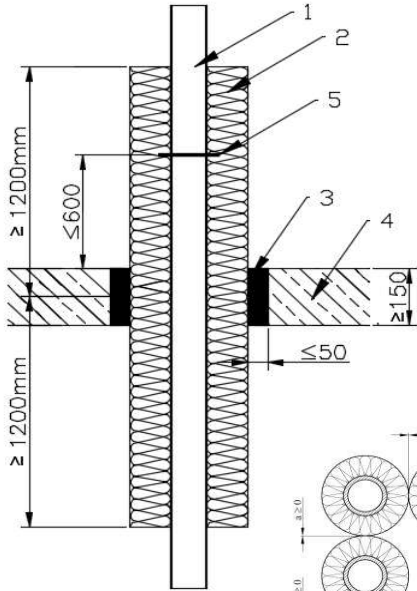


EI120 - Vertical pipe direction

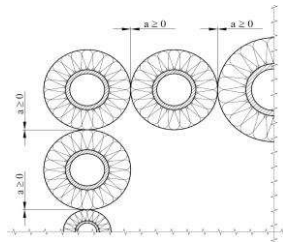
U Protect Pipe Section Alu2

Local/Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel, Cluster

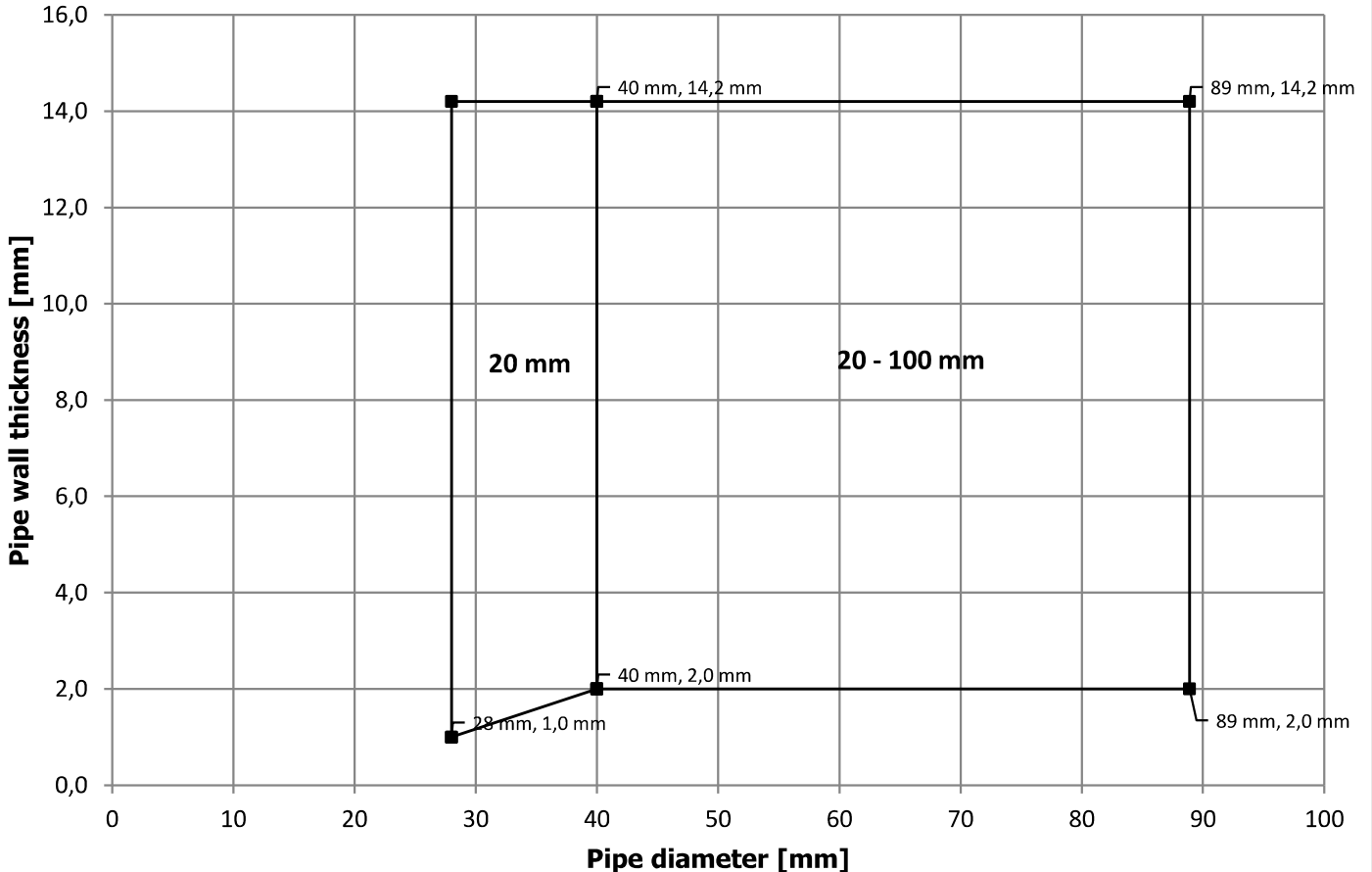


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

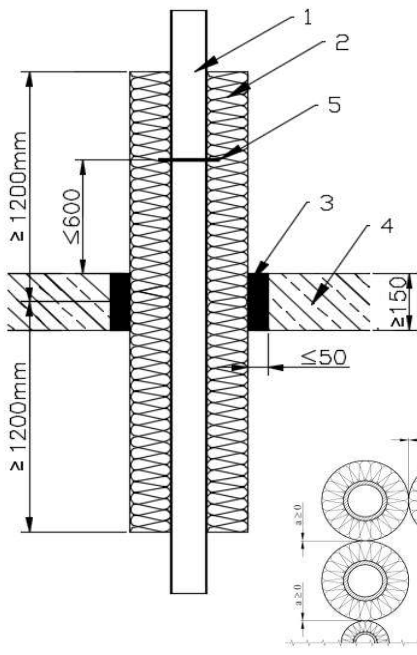


NB. For continued insulation the thickness of the insulation can be increased

Field of application for insulation thickness



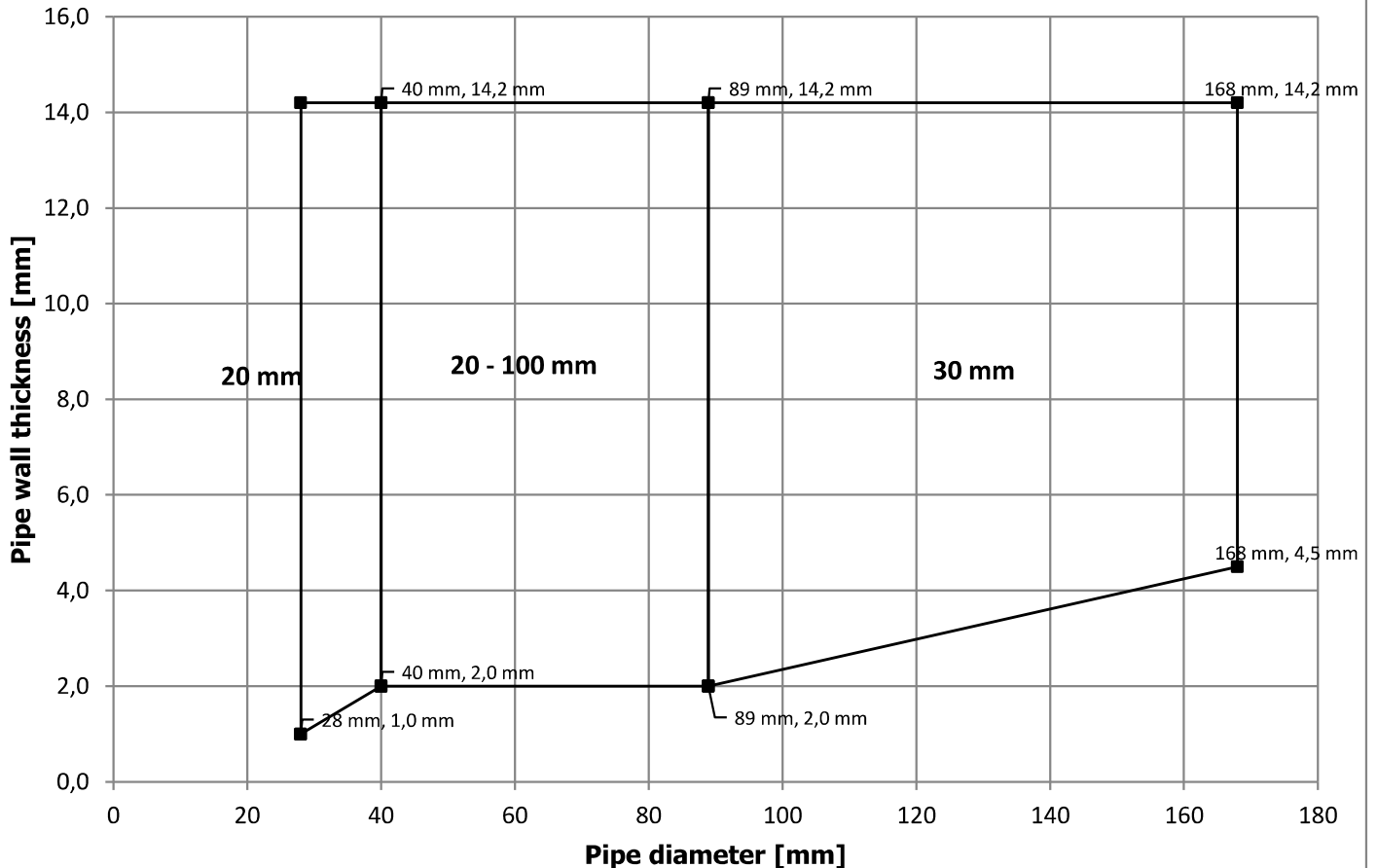
**EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Steel, Stainless steel, Cluster**



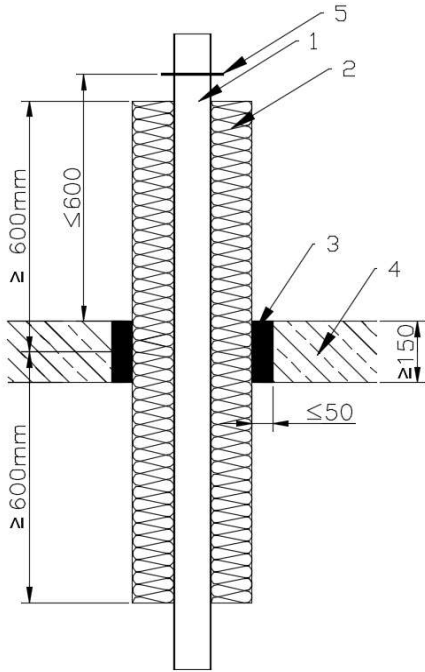
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Steel, Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry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

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

Field of application for insulation thickness



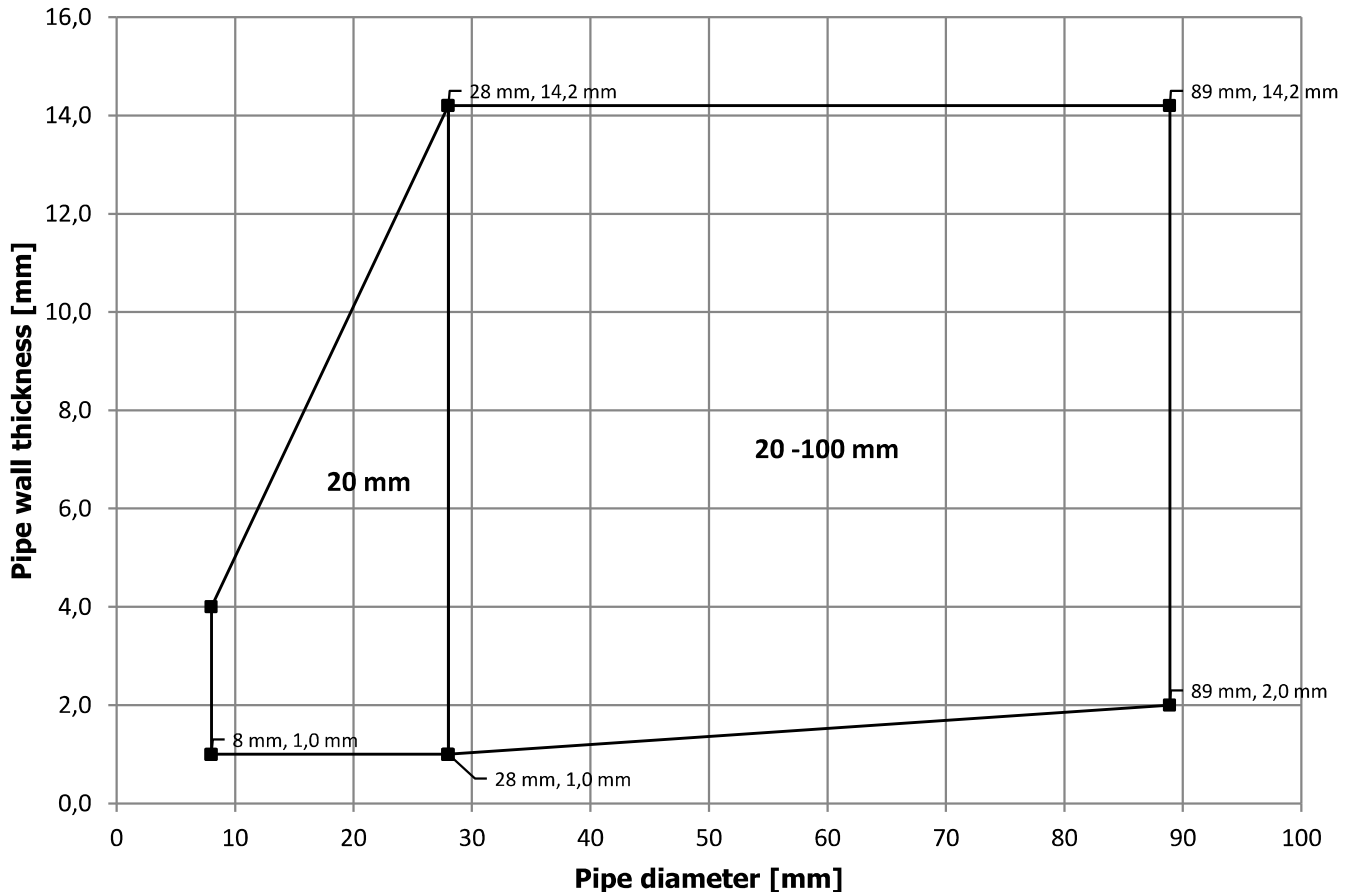
EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

Field of application for insulation thickness

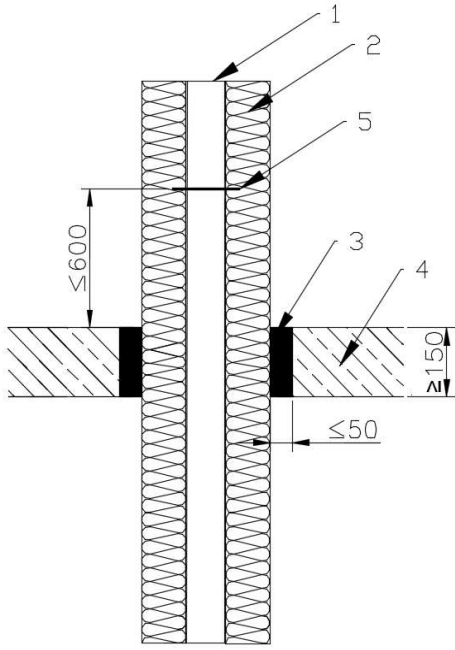


EI120 - Vertical pipe direction

U Protect Pipe Section Alu2

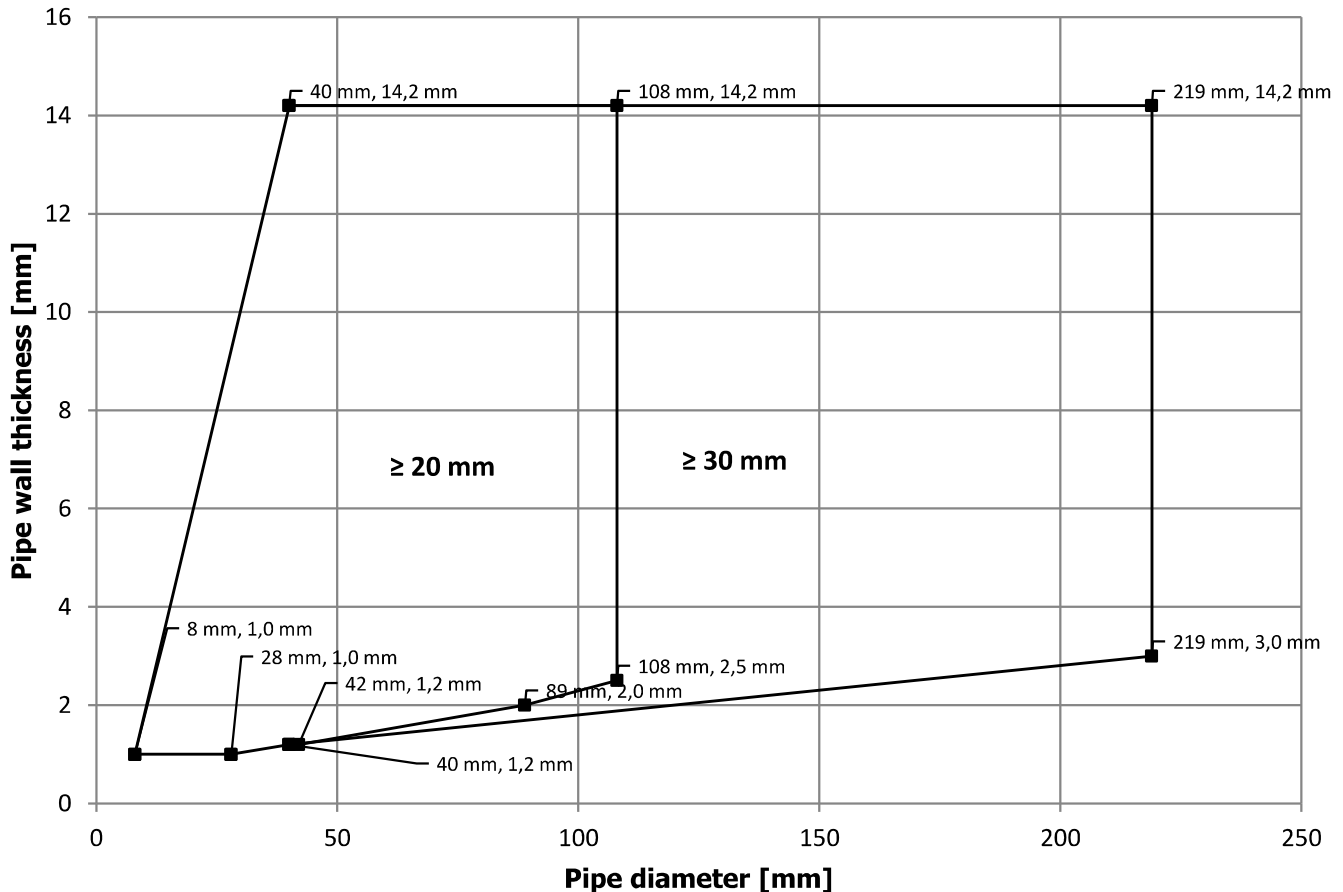
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel

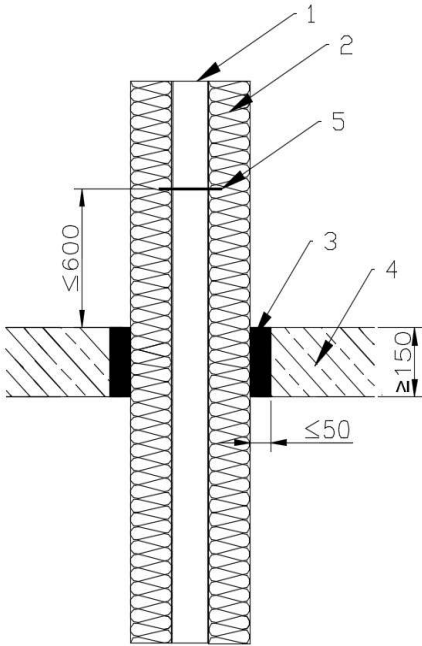


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

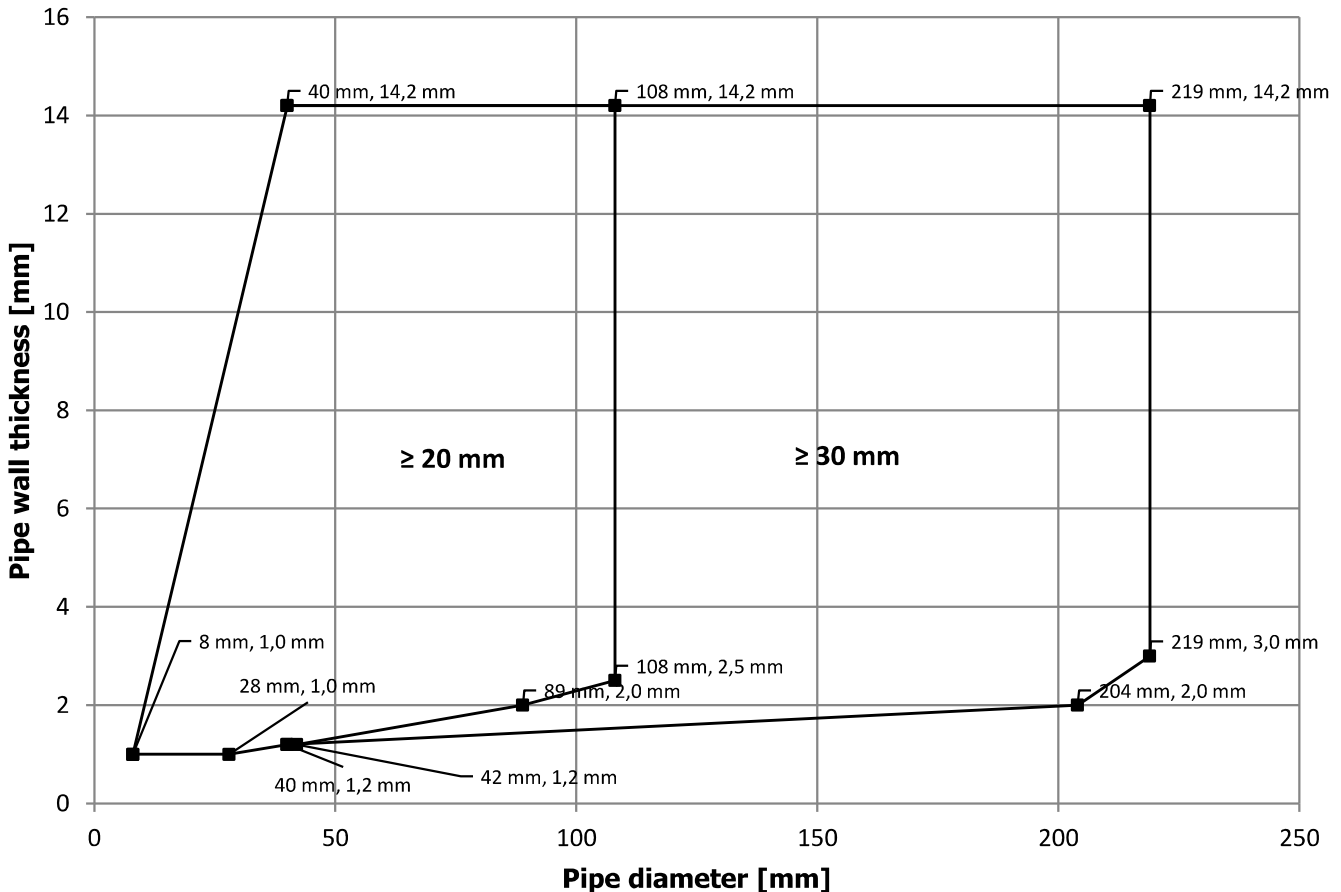


EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

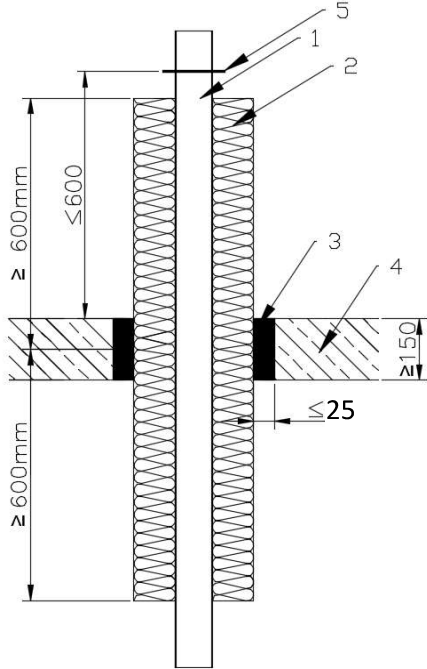


EI120 - Vertical pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, small gap filling

Copper, Cast iron, Steel and Stainless steel

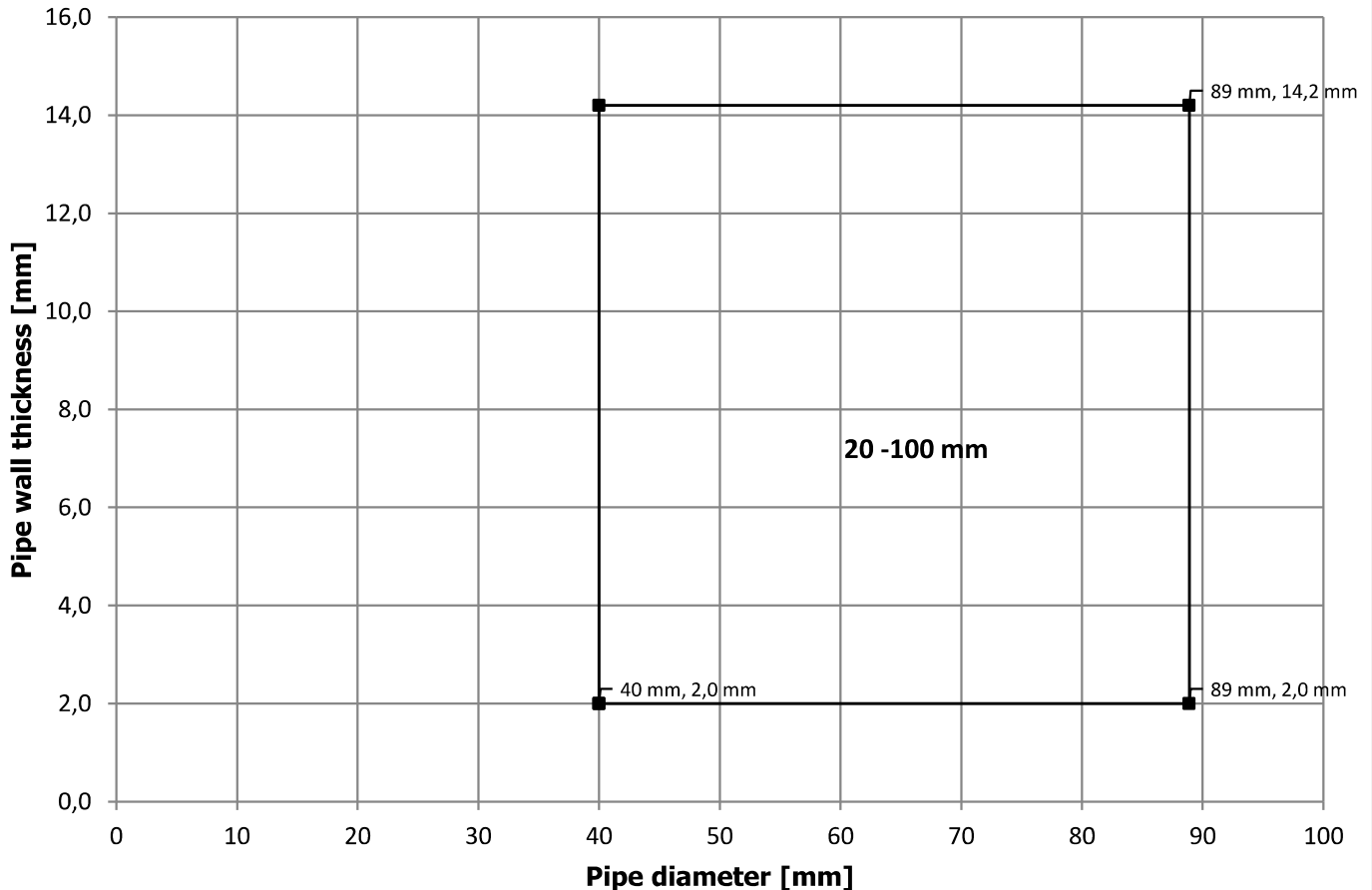


| No. | Item | Description |
|-----|-----------------|---|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap* | Protect BSK, PROMASEAL-Mastic, Pyro-Safe Flammoplast KS3 or SIBRALIT DX in a depth of ≥ 25 mm from both sides. |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

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

*Gap size of up 25 mm. In between the filling can be a void or material of Euroclass E or better.

Field of application for insulation thickness

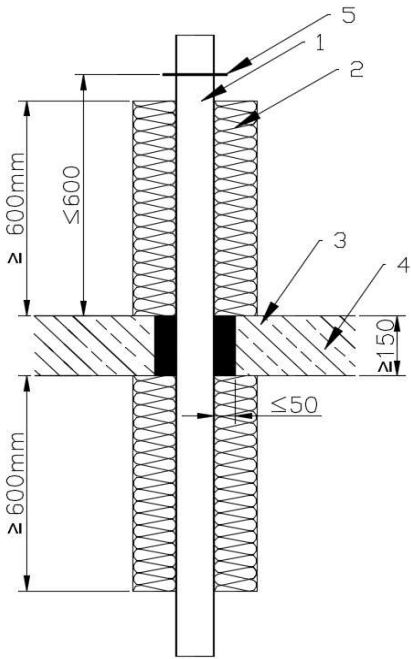


EI120 - Vertical pipe direction

U Protect Pipe Section Alu2

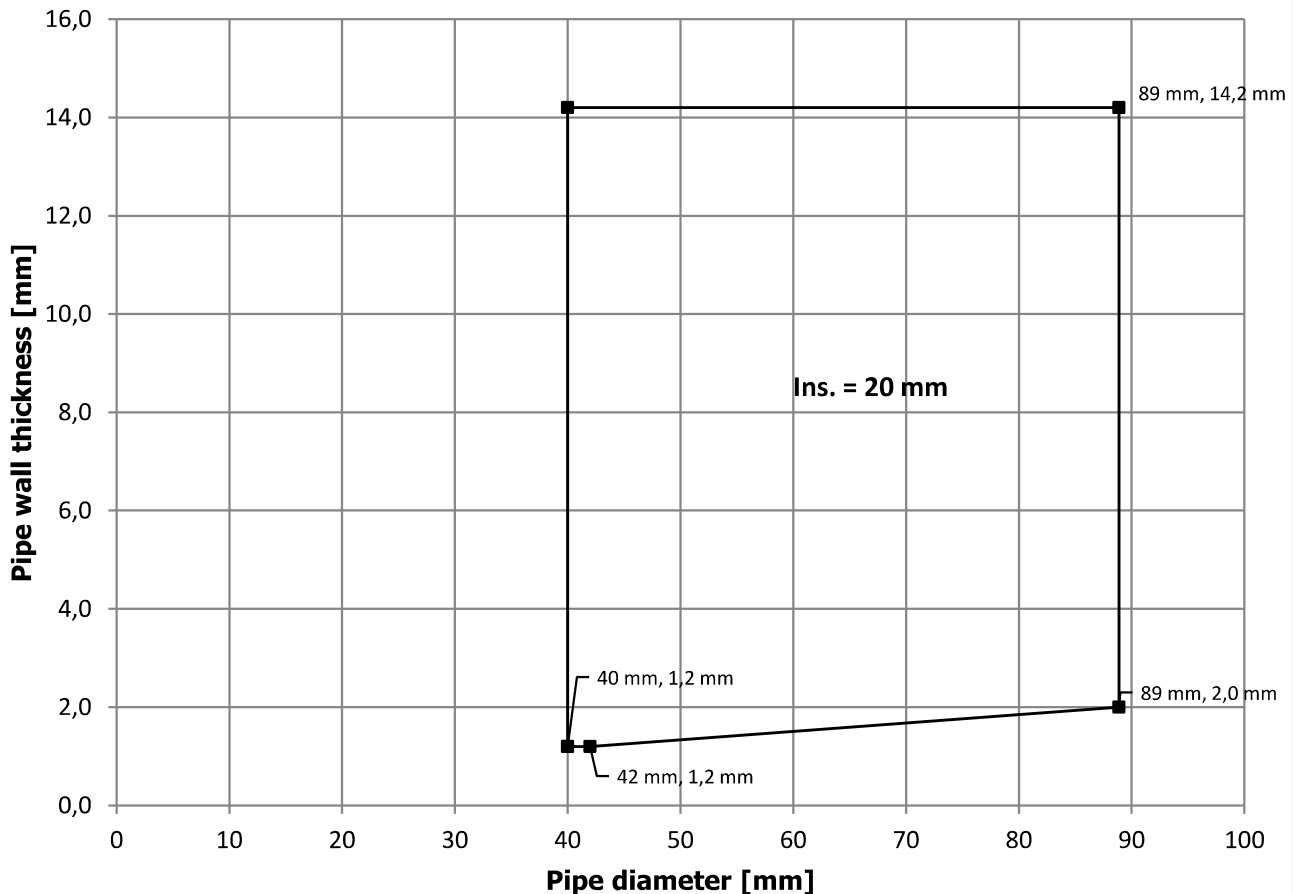
Local, Interrupted insulation

Copper, Cast iron, Steel and Stainless steel

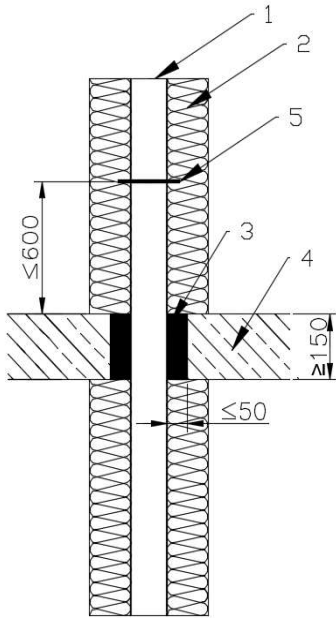


| No. | Item | Description |
|-----|-----------------|---|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete With or without: 5 mm PE sound insulation strip 3.5 mm Self-adhesive felt stripes 250 mm Sleeve type BSM-S 89 |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

Field of application for insulation thickness

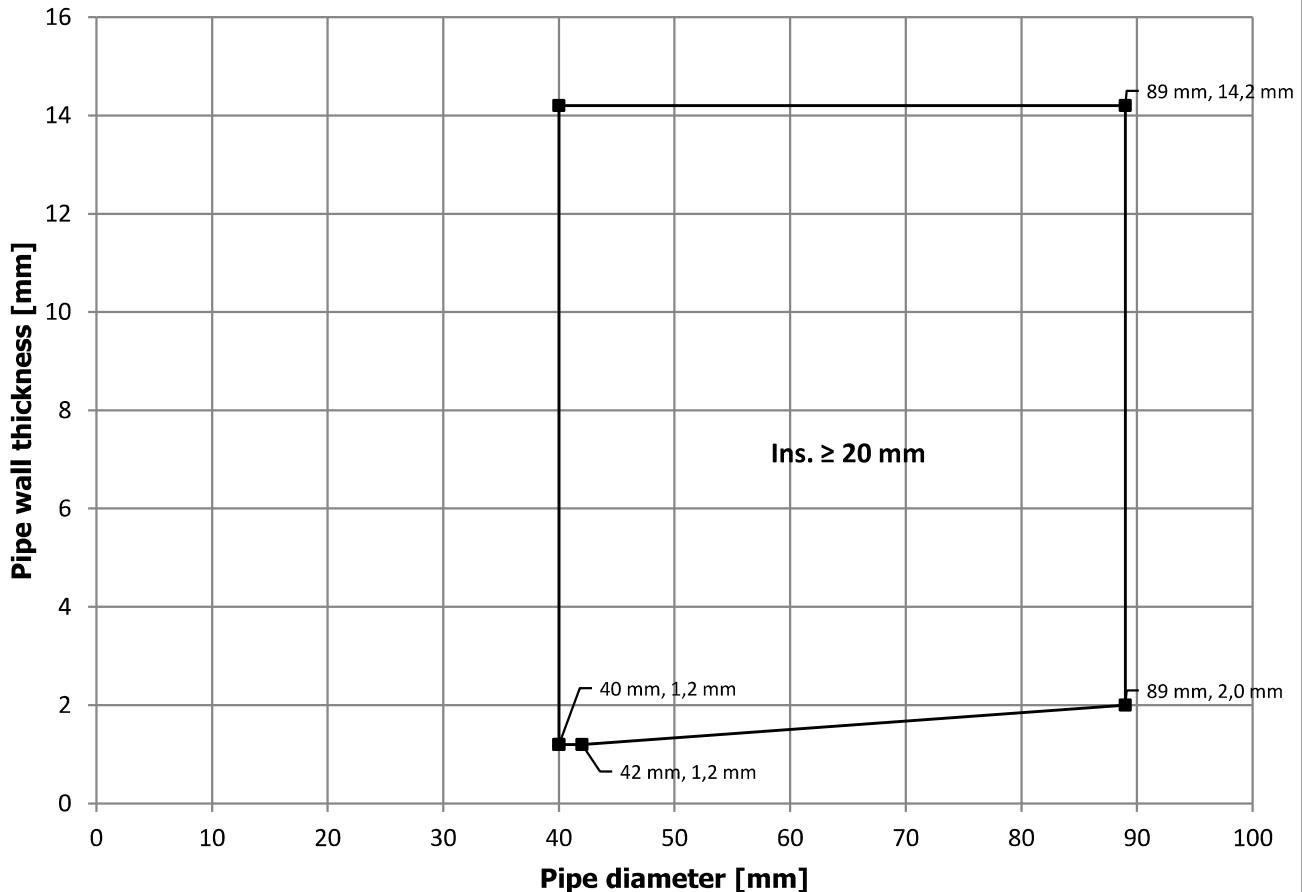


EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Interrupted insulation
Copper, Cast iron, Steel and Stainless steel

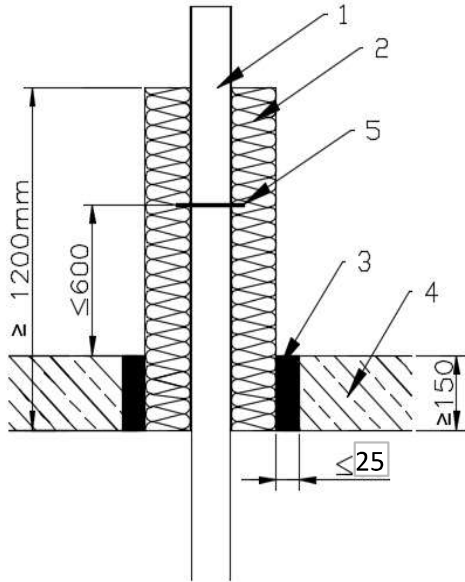


| No. | Item | Description |
|-----|-----------------|---|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete With or without: 5 mm PE sound insulation strip 3.5 mm Self-adhesive felt stripes 250 mm Sleeve type BSM-S 89 |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

Field of application for insulation thickness

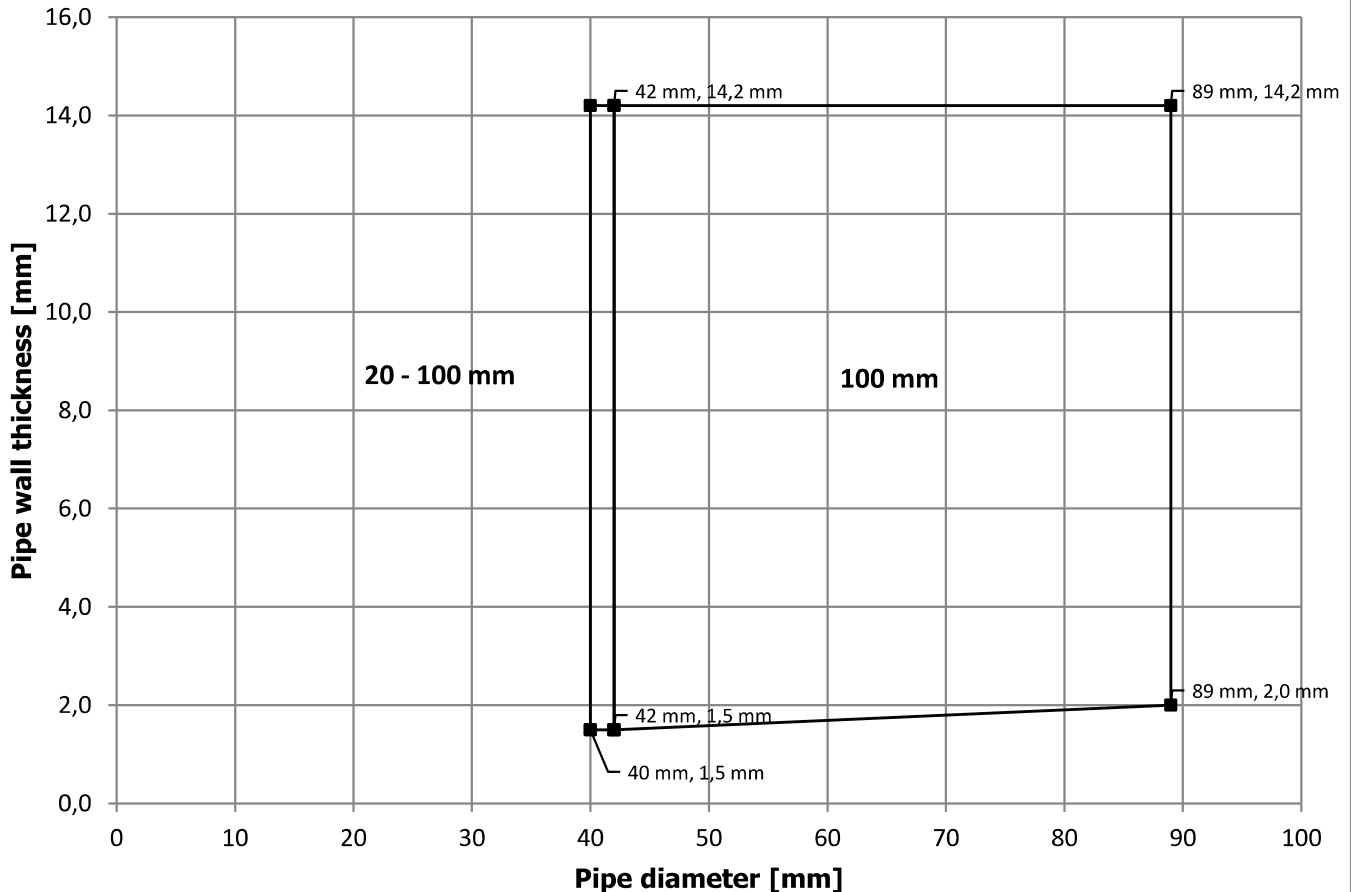


EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained asymmetrical insulation
Copper, Cast iron, Steel and Stainless steel

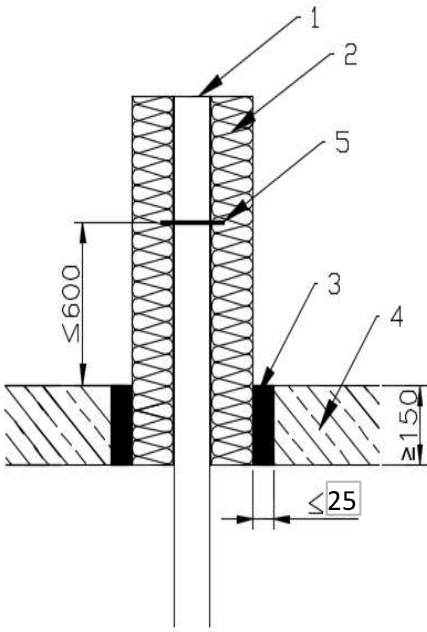


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

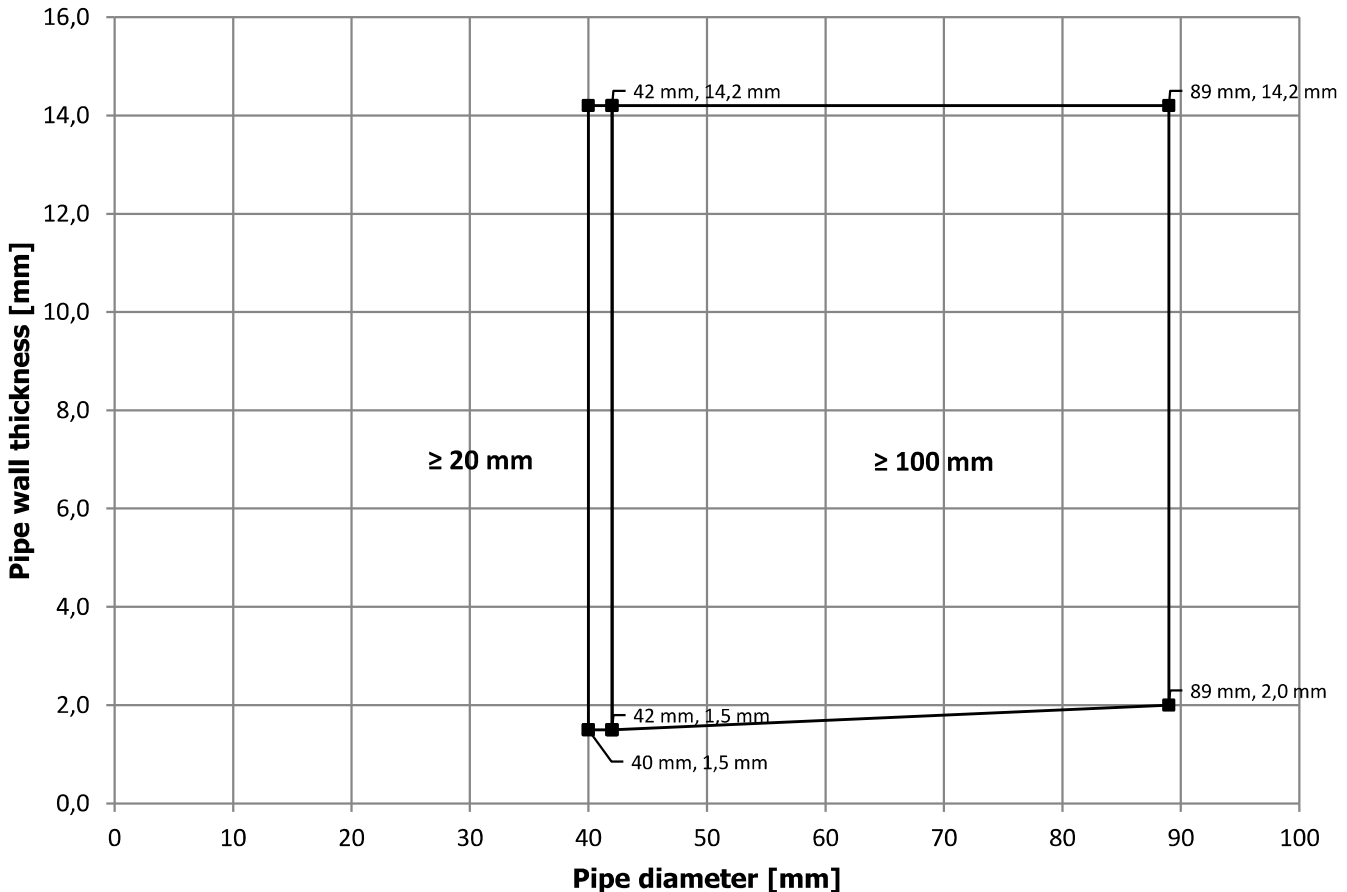


EI120 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Sustained asymmetrical insulation
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

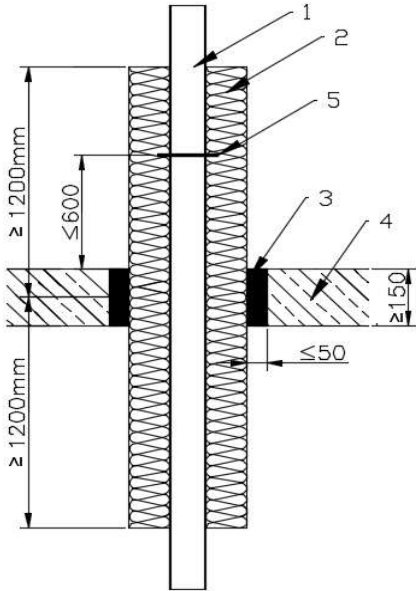


EI90 - Vertical pipe direction

U Protect Pipe Section Alu2

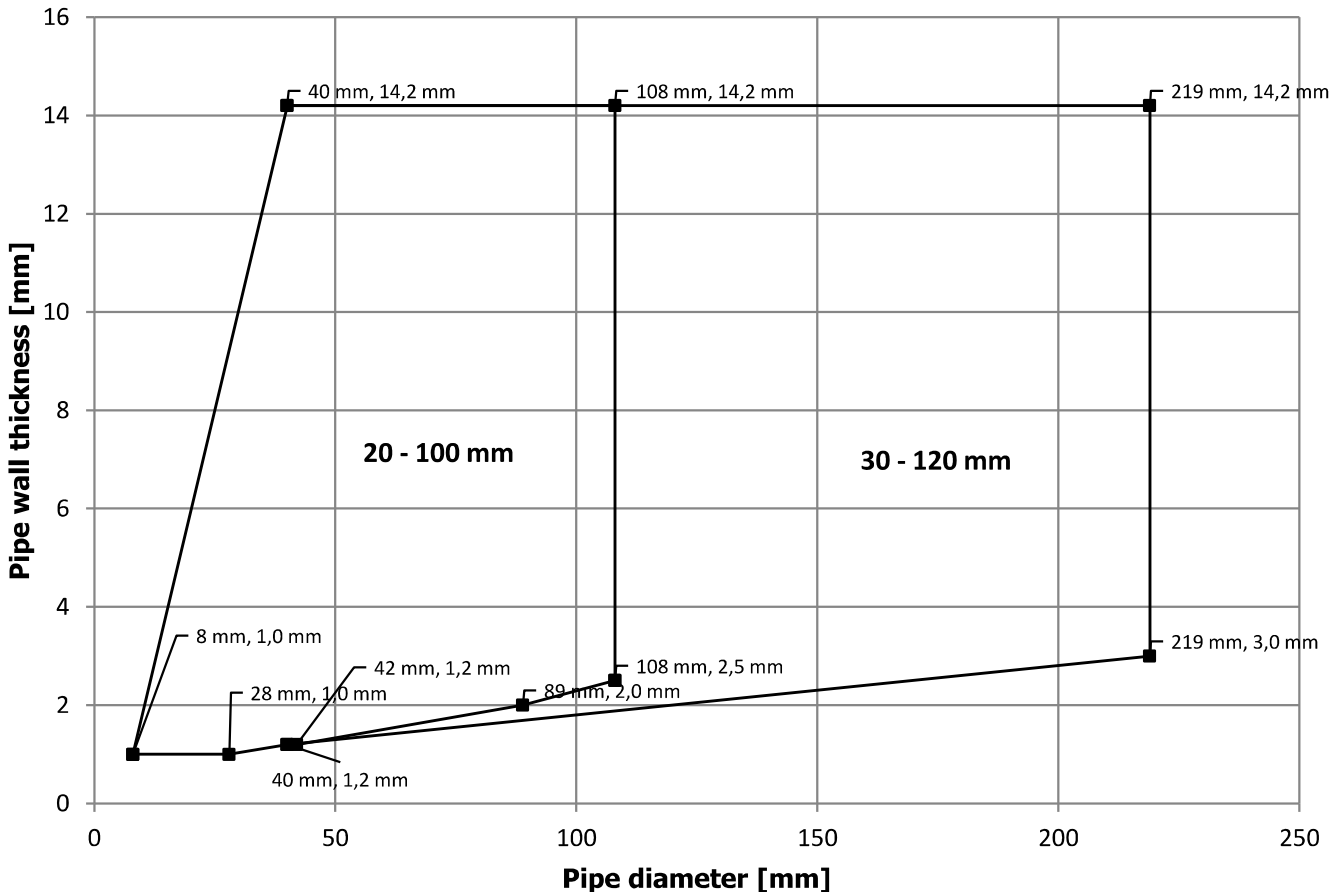
Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel

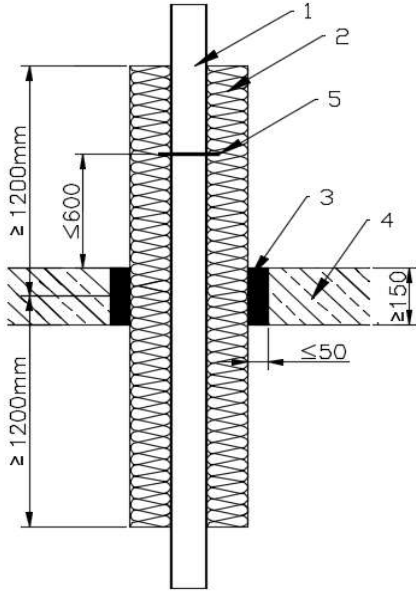


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

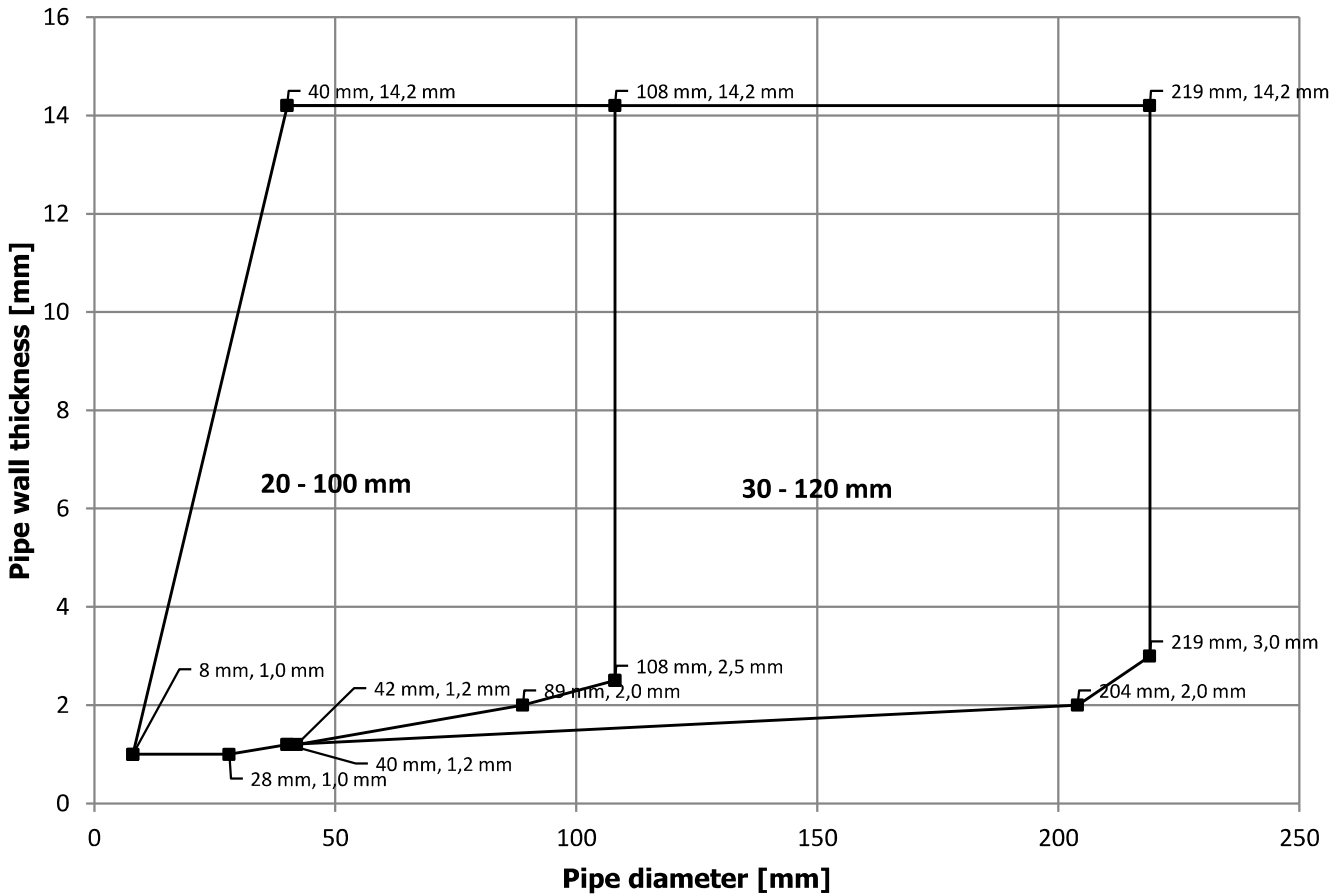


El90 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Stainless steel

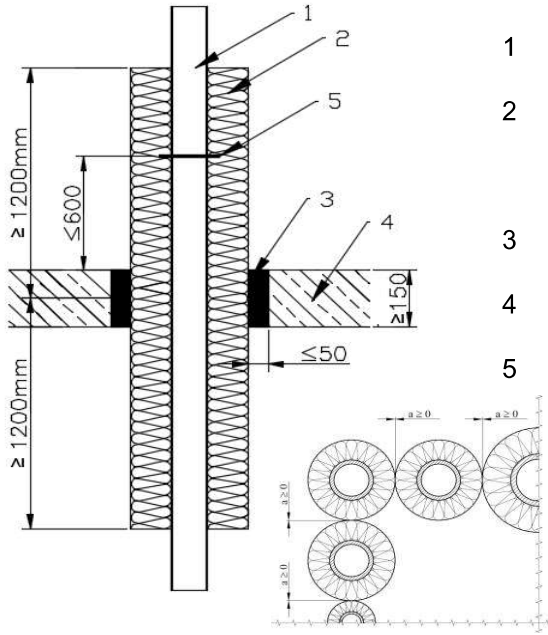


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5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

Field of application for insulation thickness



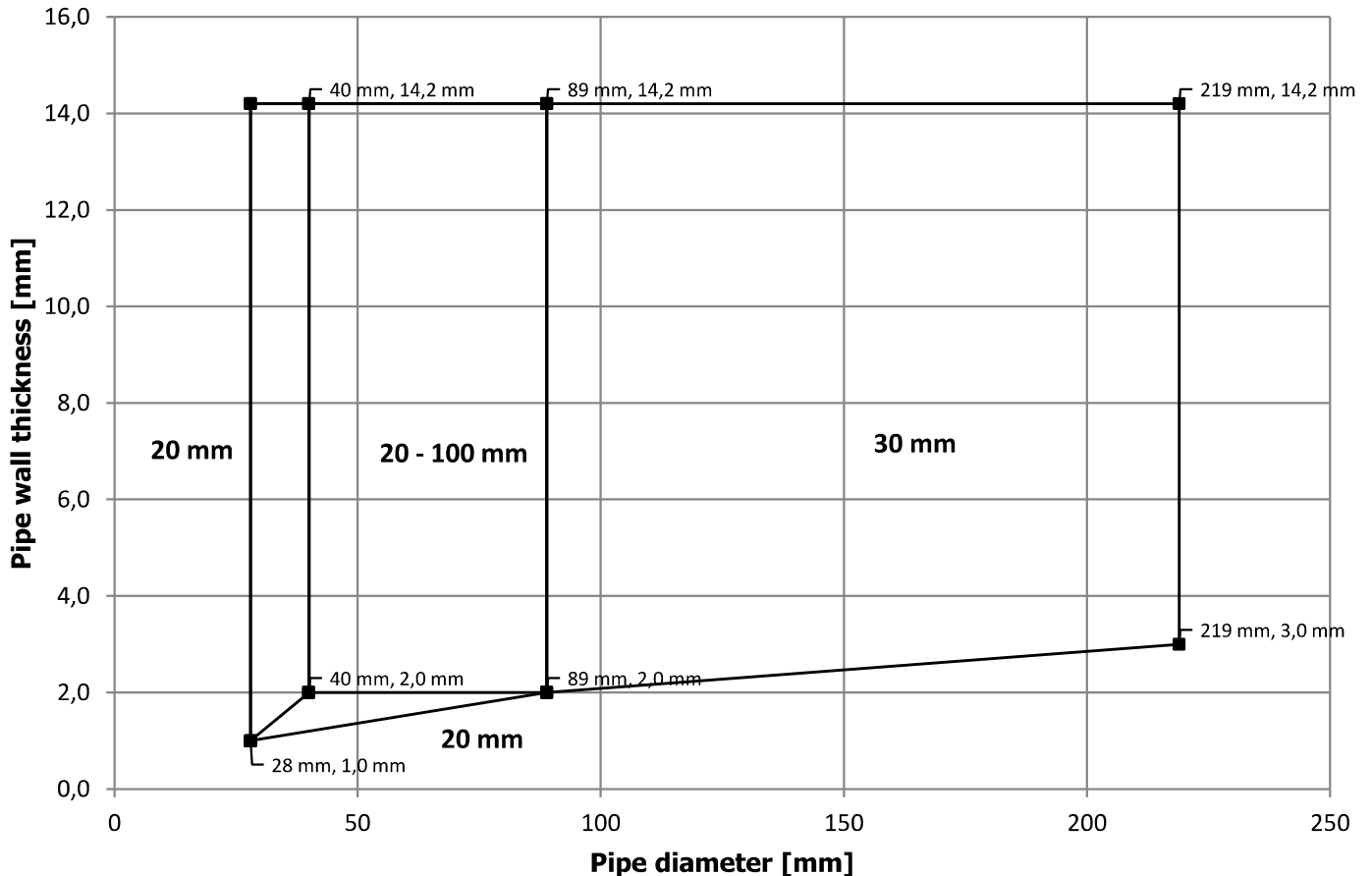
El90 - Vertical pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel, Cluster



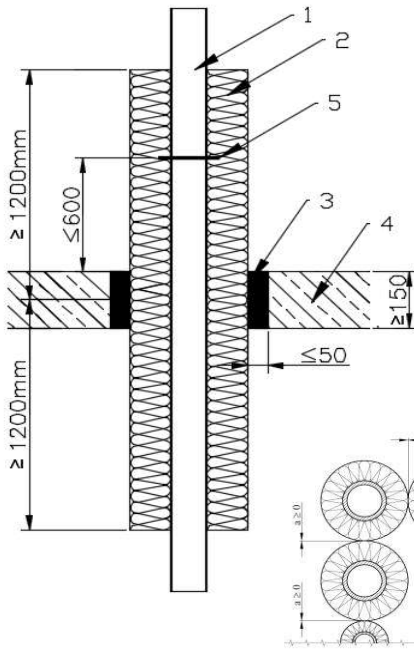
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

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

Field of application for insulation thickness



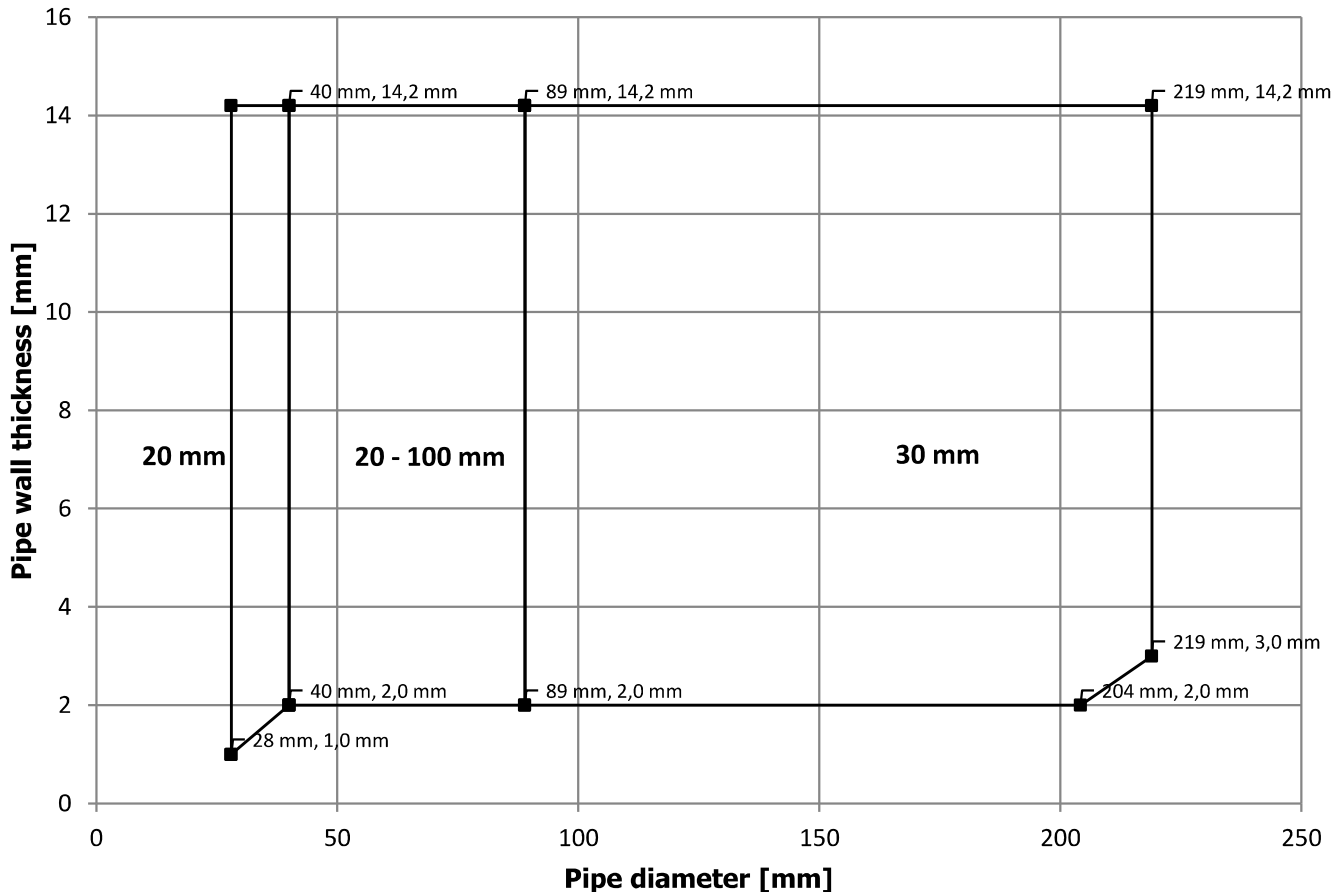
EI90 - Vertical pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Stainless steel, Cluster



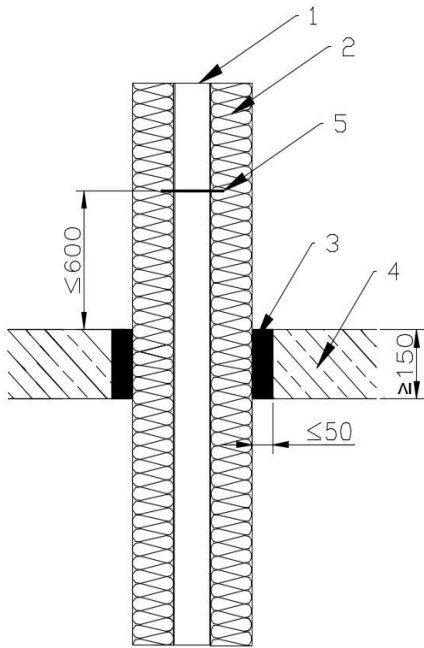
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5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

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

Field of application for insulation thickness

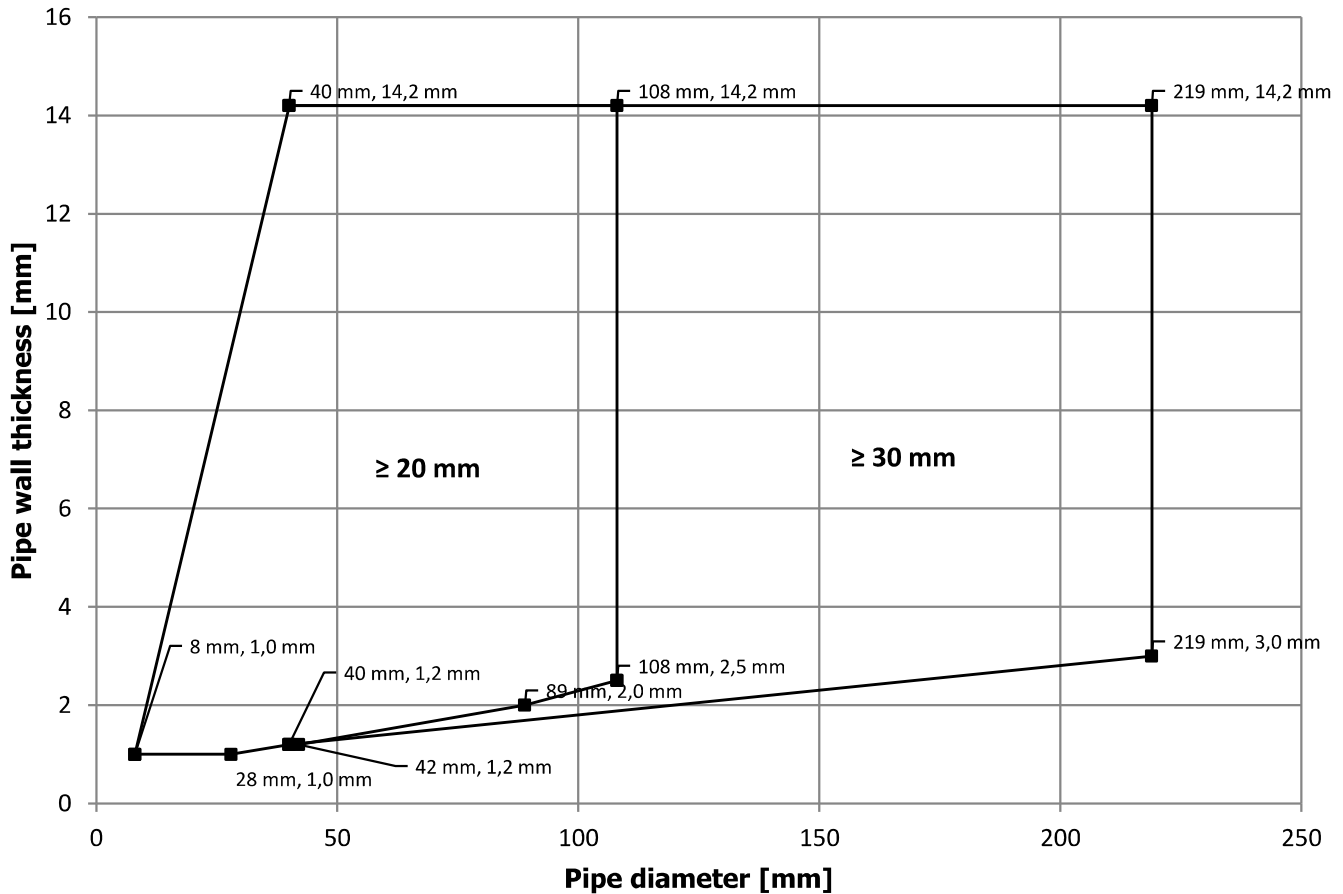


EI90 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

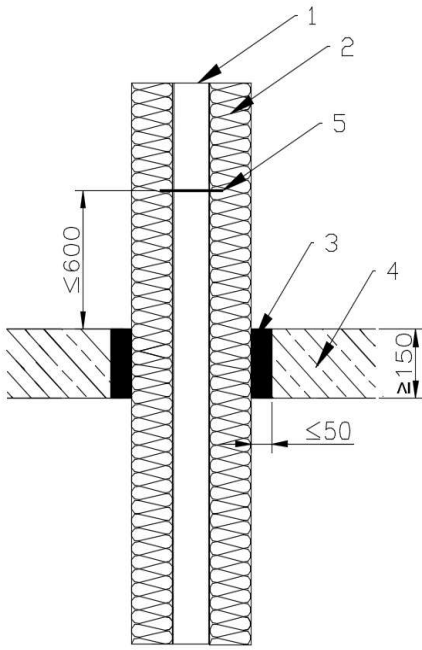


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

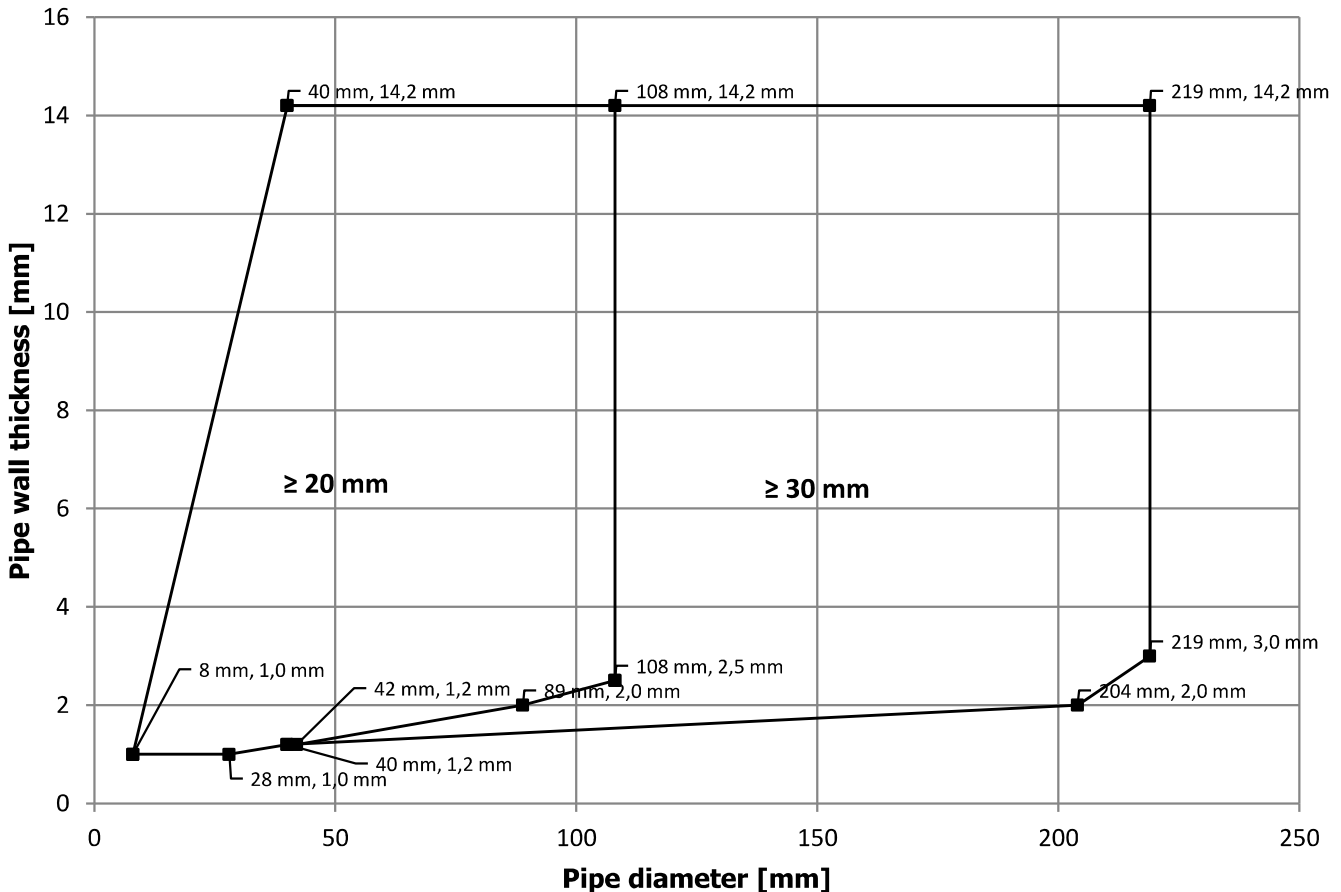


EI90 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

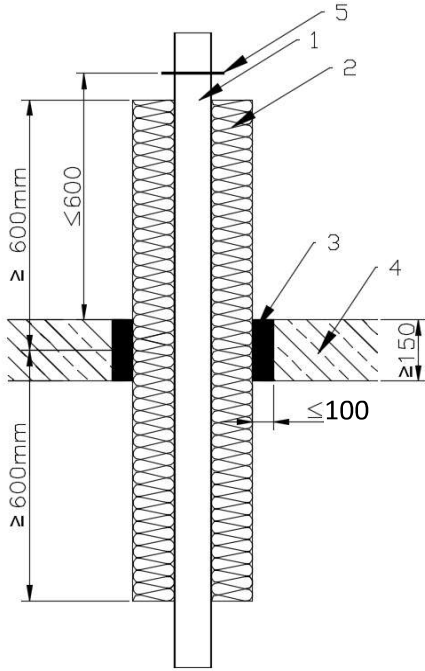


EI90 - Vertical pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, 100 mm residual gap

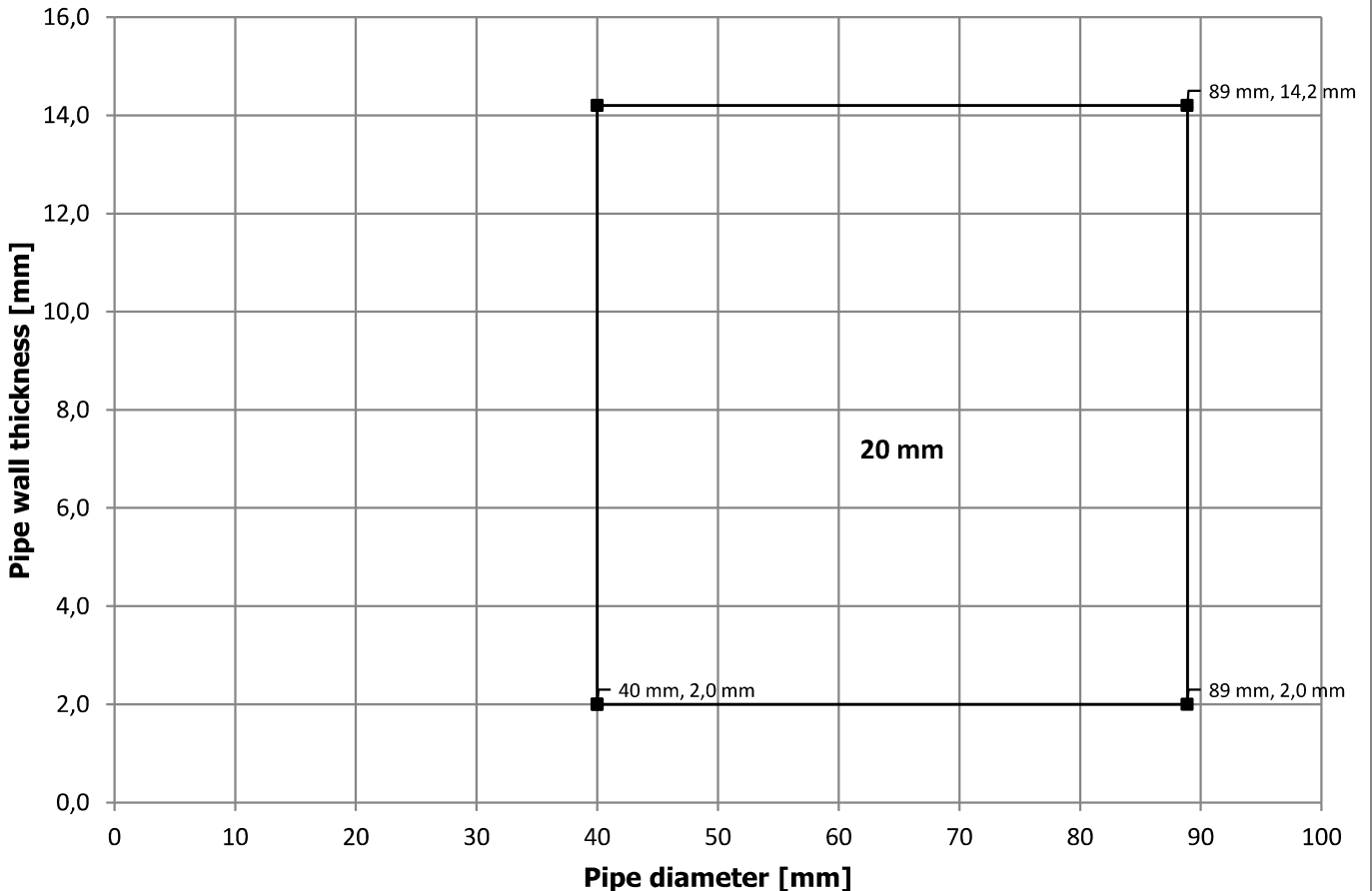
Copper, Cast iron, Steel and Stainless steel



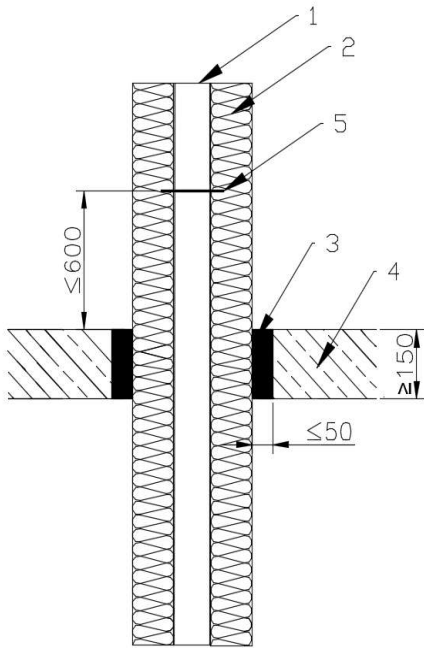
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Up to 100 mm filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

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

Field of application for insulation thickness

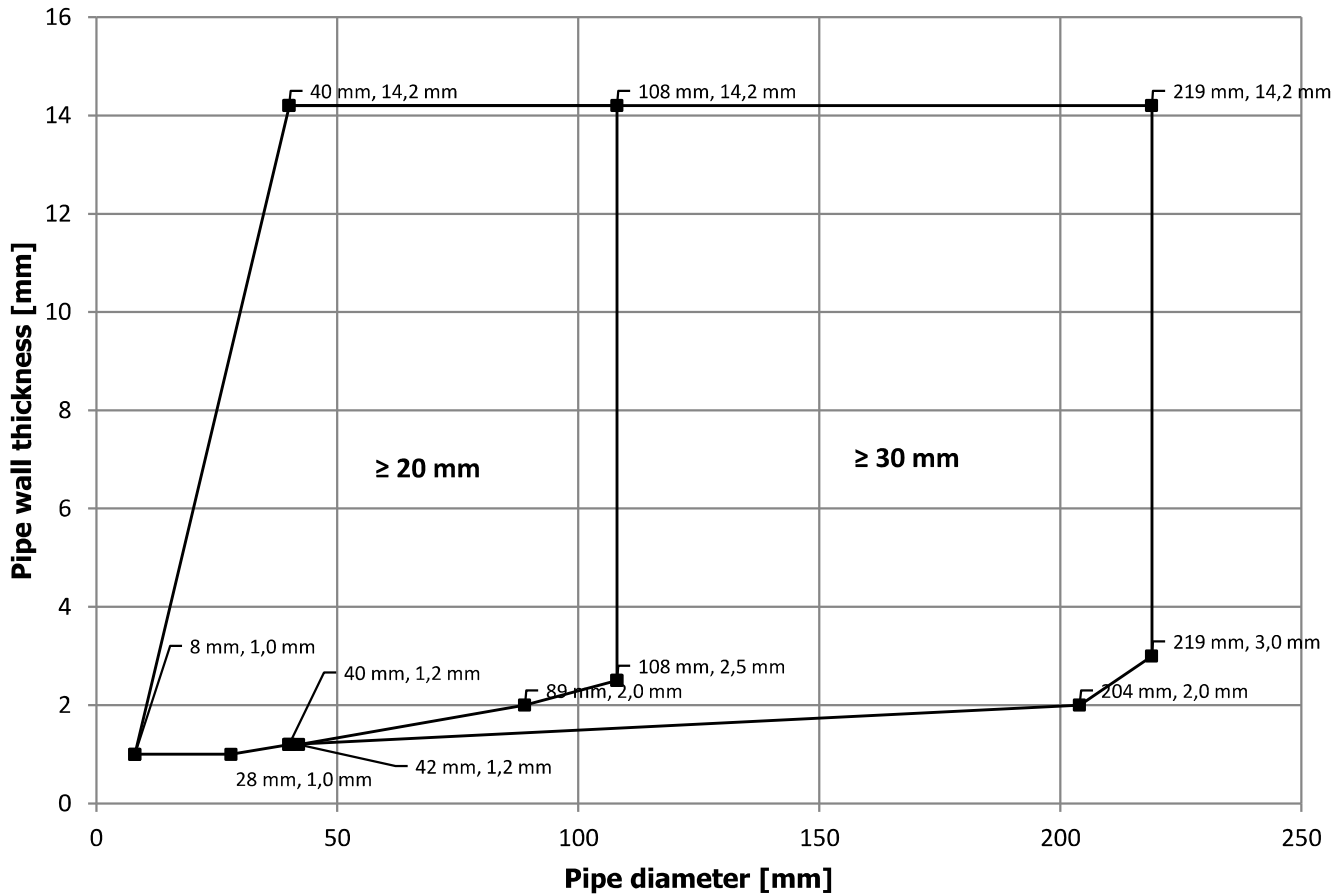


EI90 - Vertical pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to 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

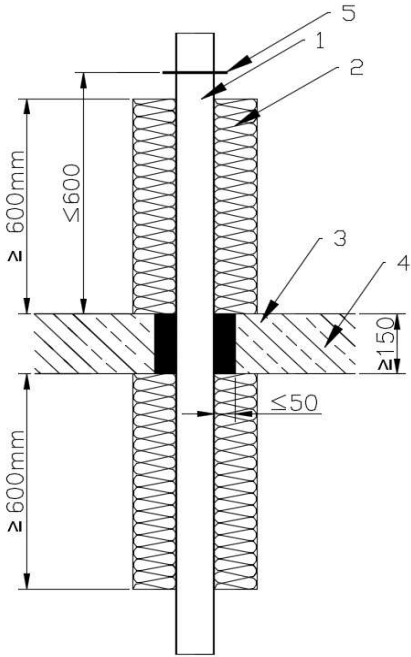


EI90 - Vertical pipe direction

U Protect Pipe Section Alu2

Local, Interrupted insulation

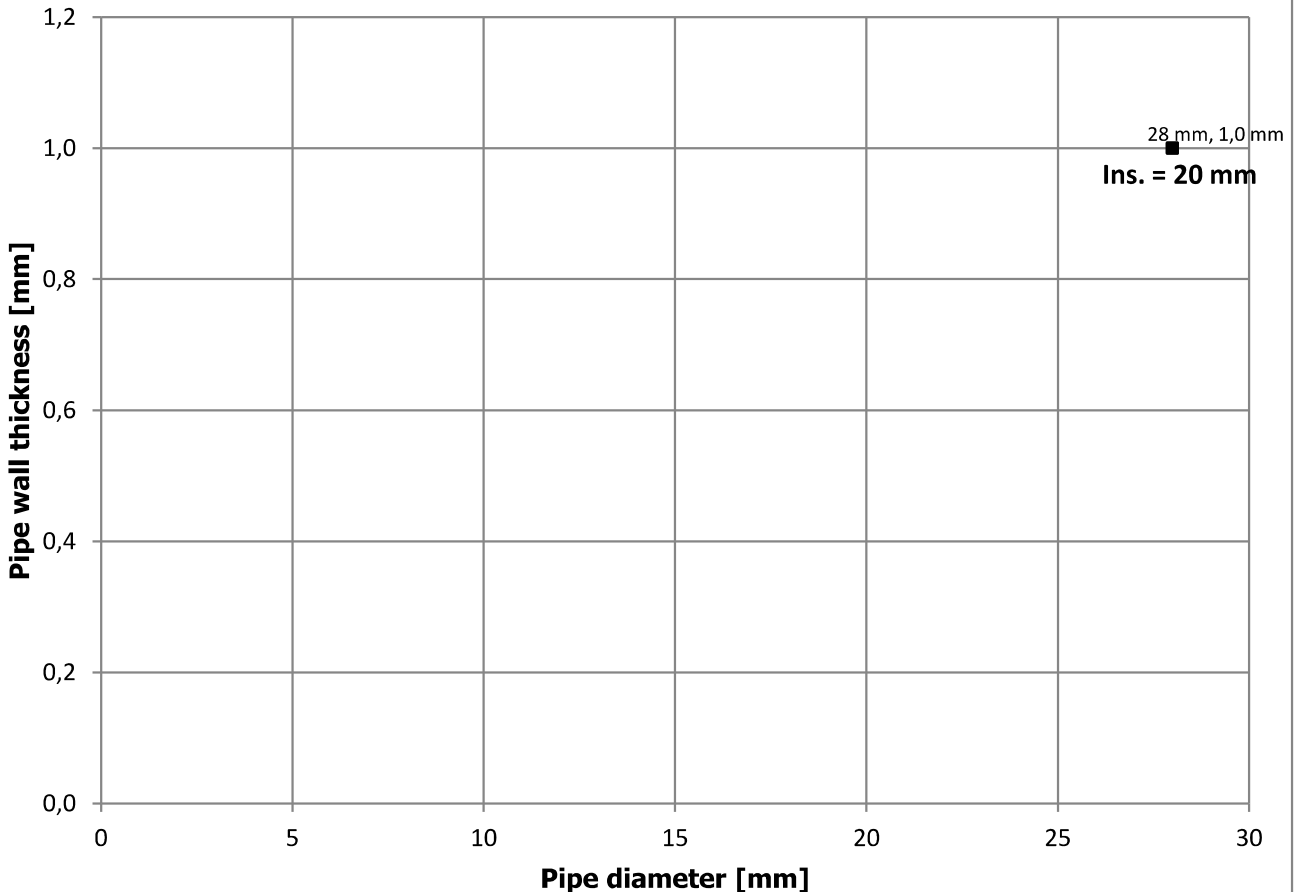
Copper, Cast iron, Steel and Stainless steel



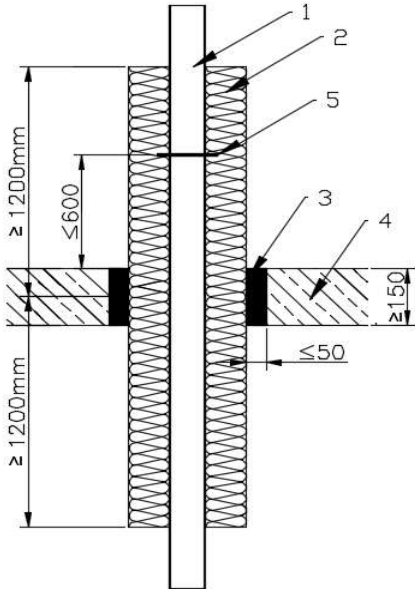
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete Including: pp-pipe 110 mm |
| 4 | Ceiling | 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



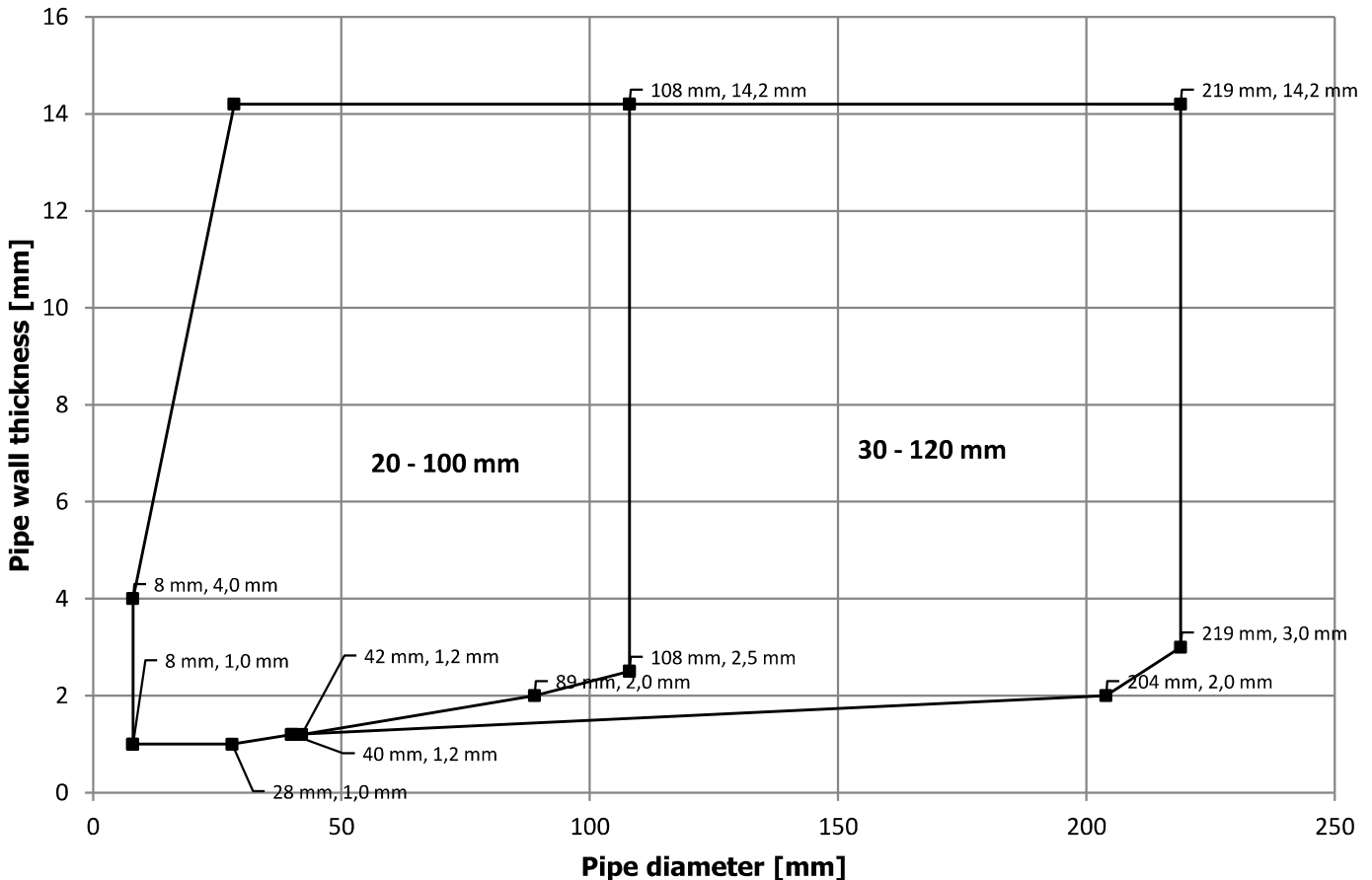
El60 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Stainless steel



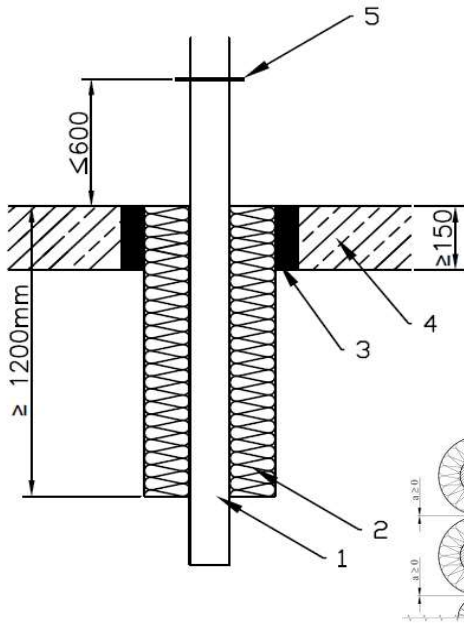
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with loose stonewool minimum density 120 kg (compressed) |
| 4 | Ceiling | Aerated concrete, 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



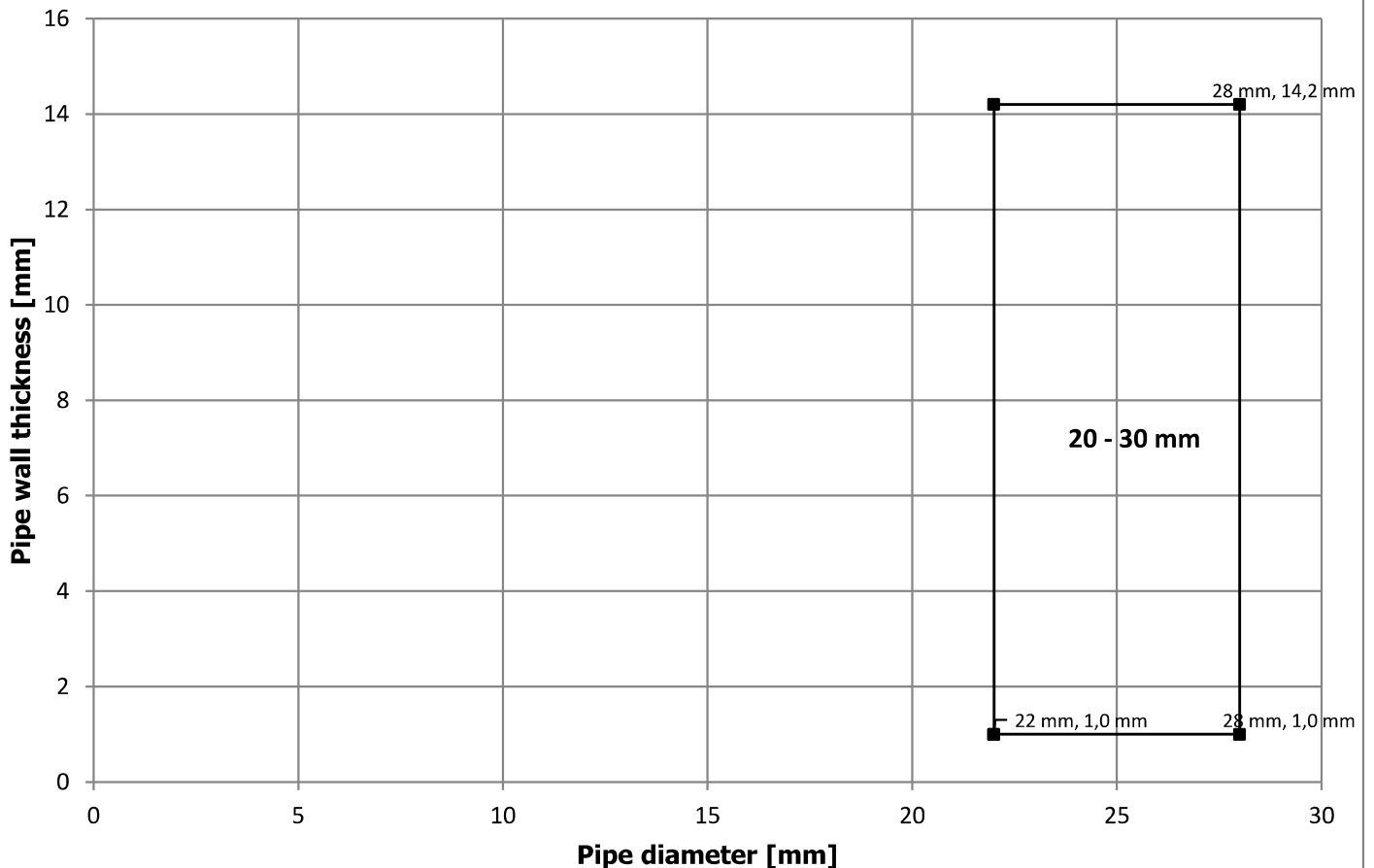
EI30 - Vertical pipe direction
U Protect Pipe Section Alu2
Local, Sustained asymmetrical insulation
Copper, Cast iron, Steel and Stainless steel, Cluster



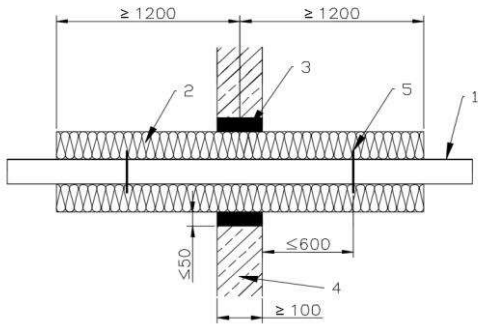
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with loose stonewool minimum density 120 kg/m ³ |
| 4 | Ceiling | 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

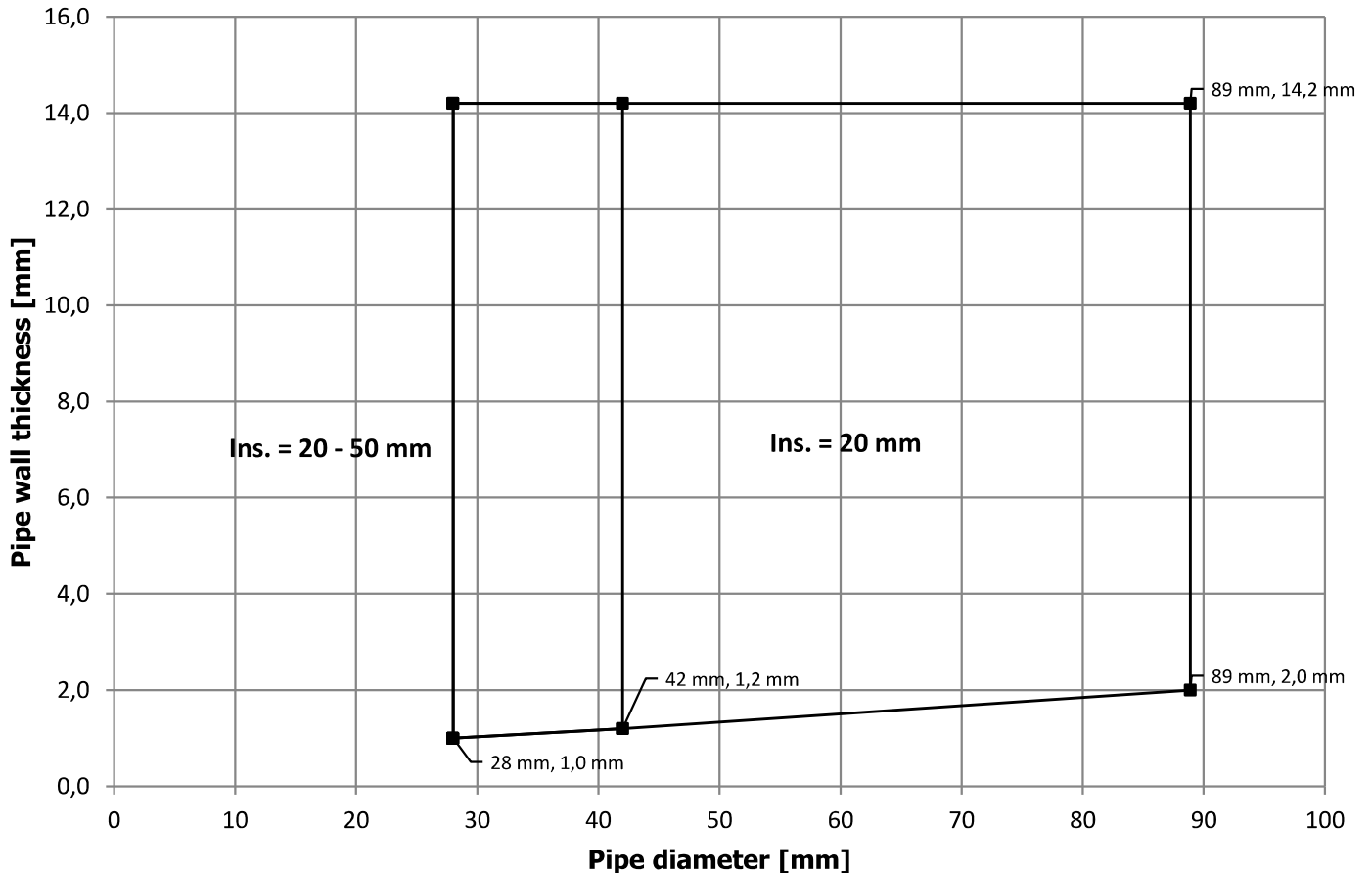


EI120 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

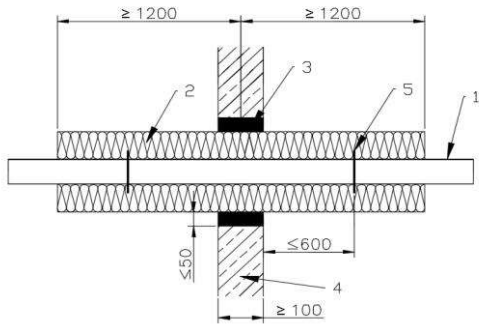


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible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

Field of application for insulation thickness



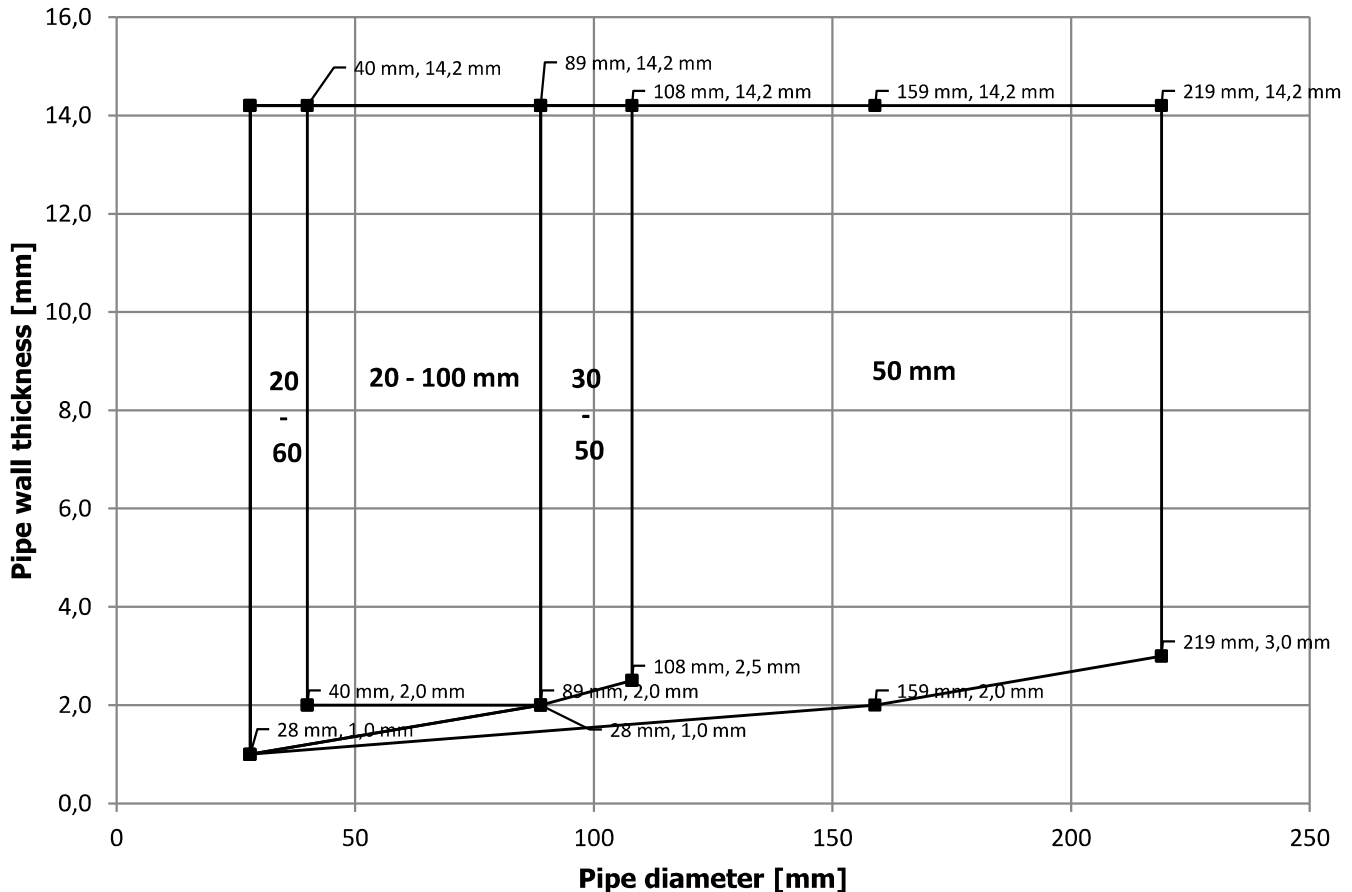
EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Stainless steel



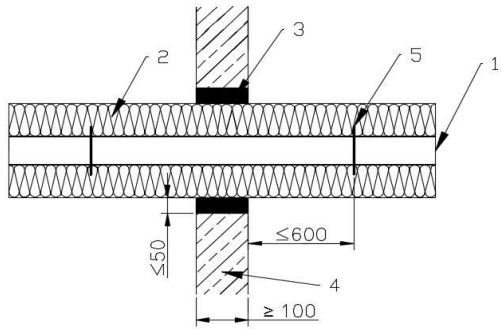
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible wall or Aerated concrete, 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

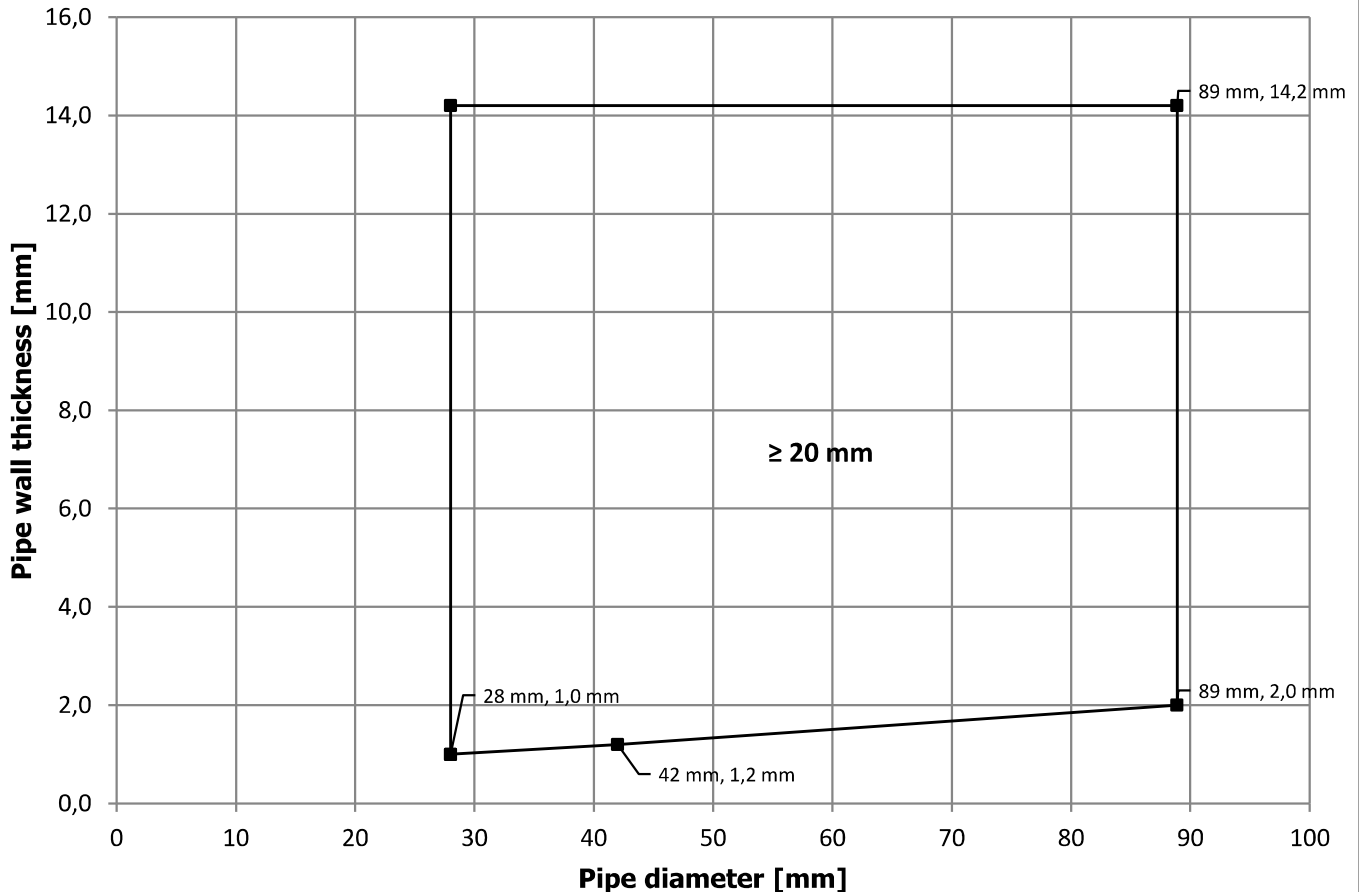


EI120 - Horizontal pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

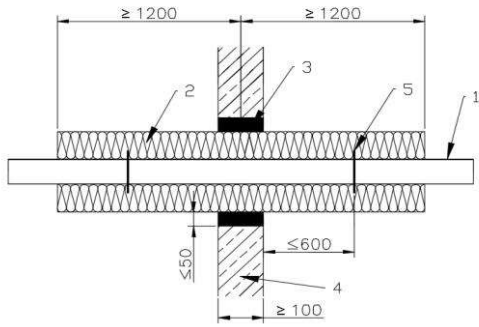


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible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

Field of application for insulation thickness

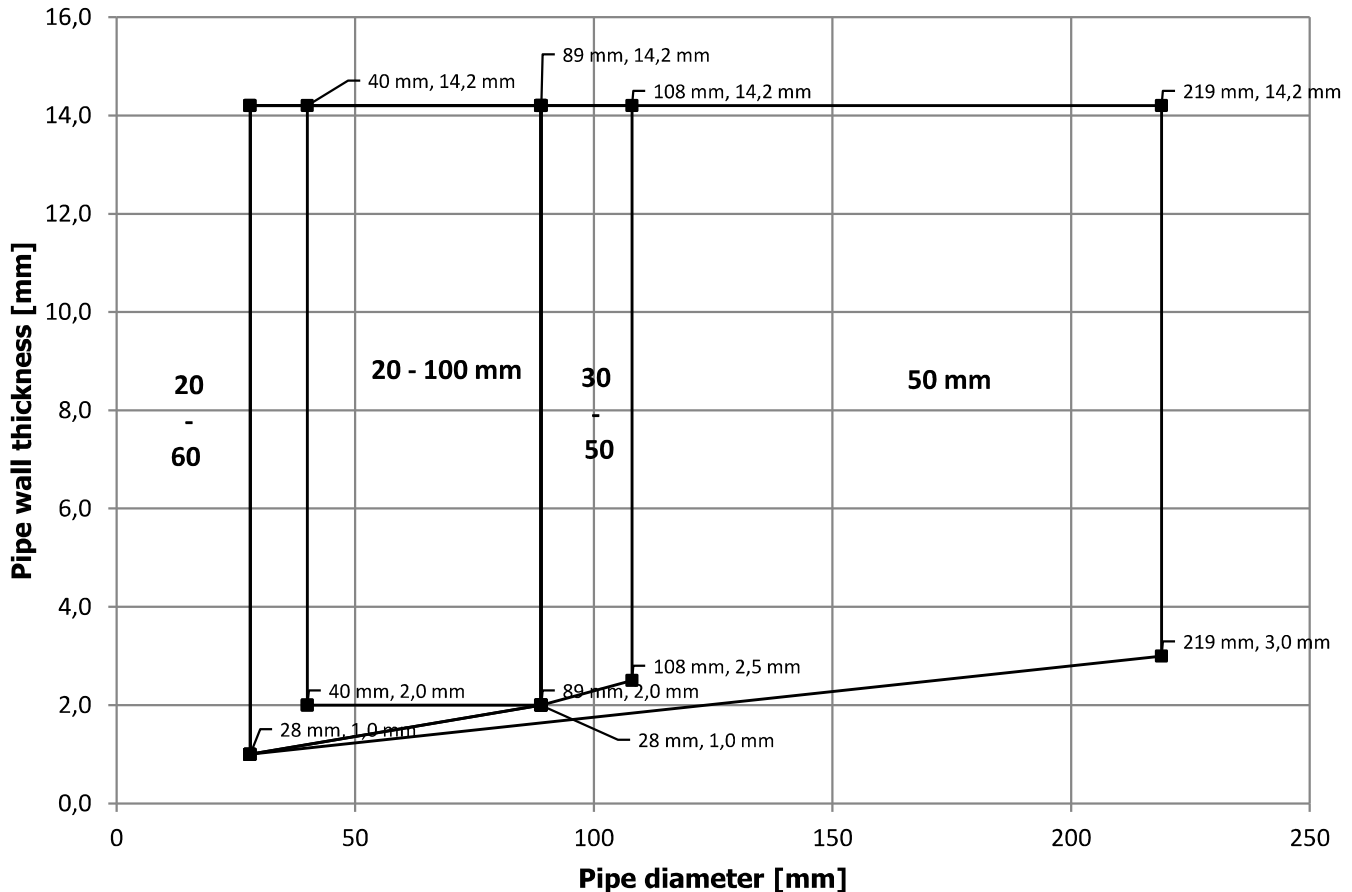


EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local, Sustained insulation
Copper, Cast iron, Steel and Stainless steel



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

Field of application for insulation thickness

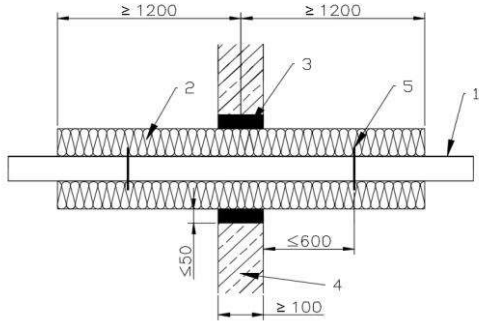


EI90 - Horizontal pipe direction

U Protect Pipe Section Alu2

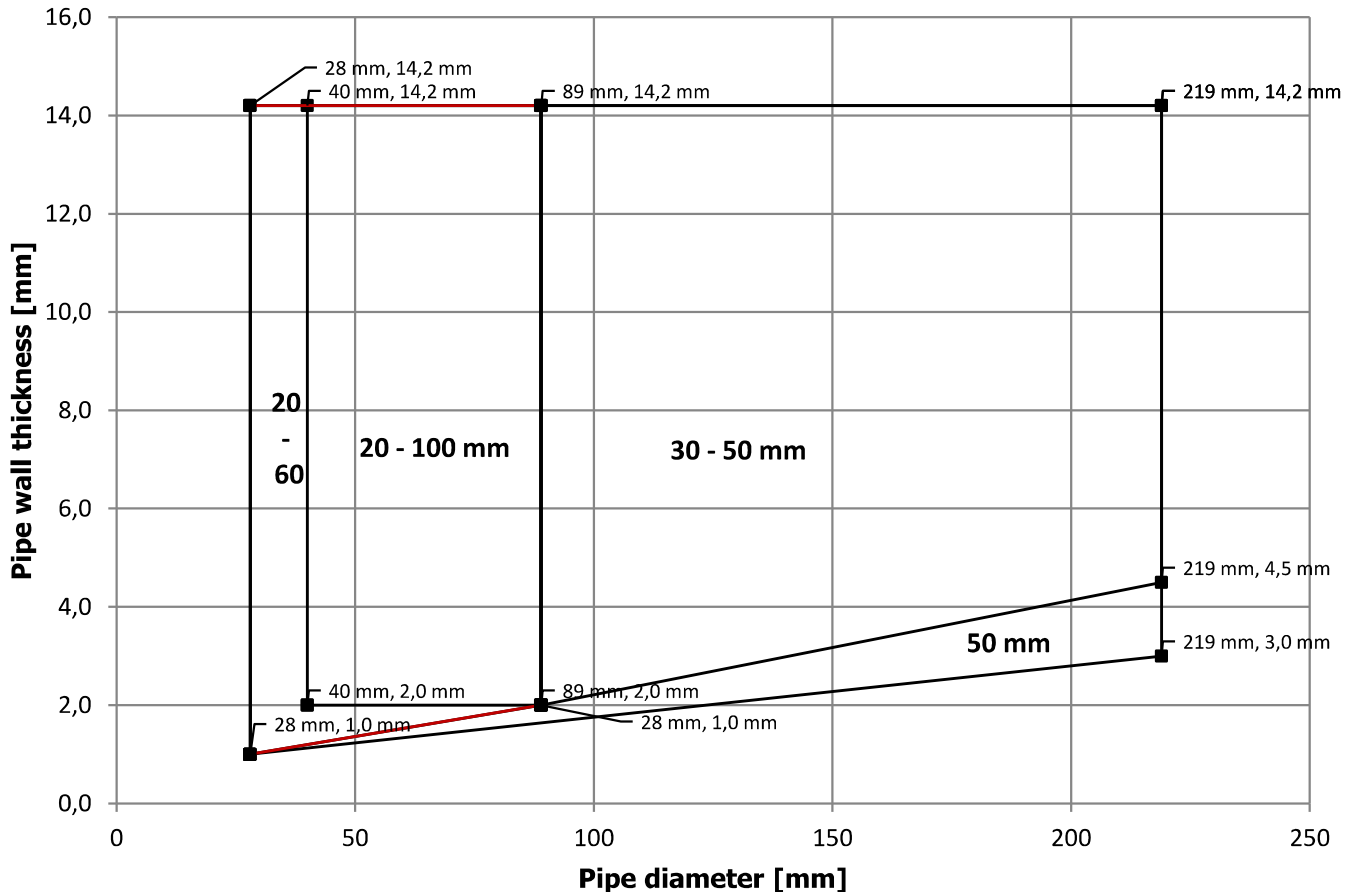
Local, Sustained insulation

Steel and Stainless steel

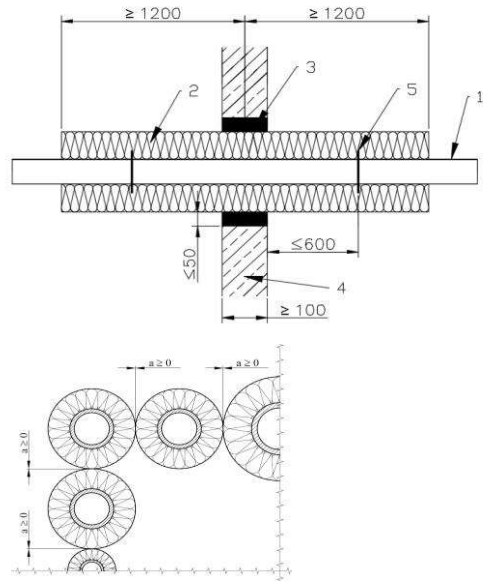


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible wall or Aerated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

Field of application for insulation thickness



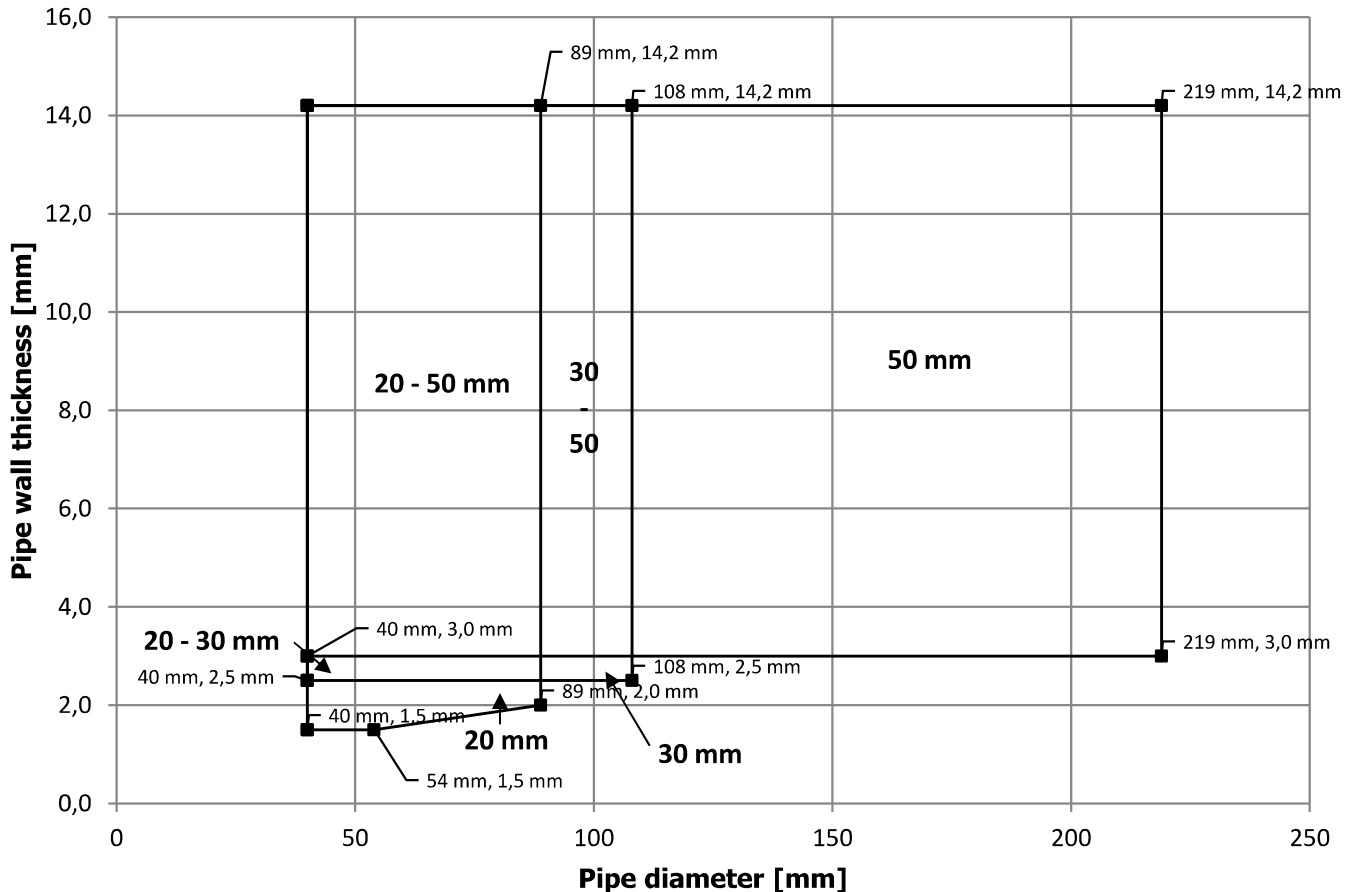
EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel, Cluster



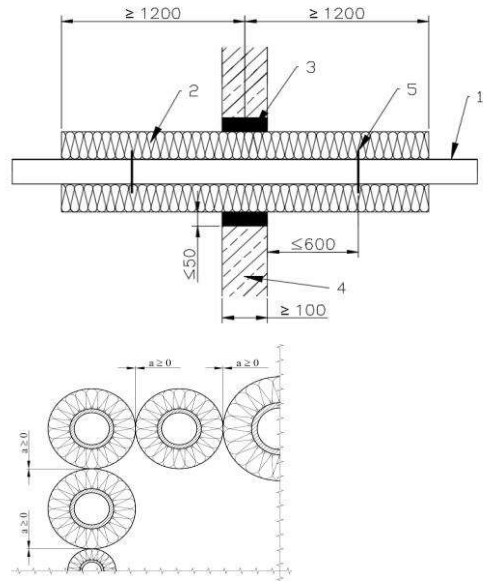
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible 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



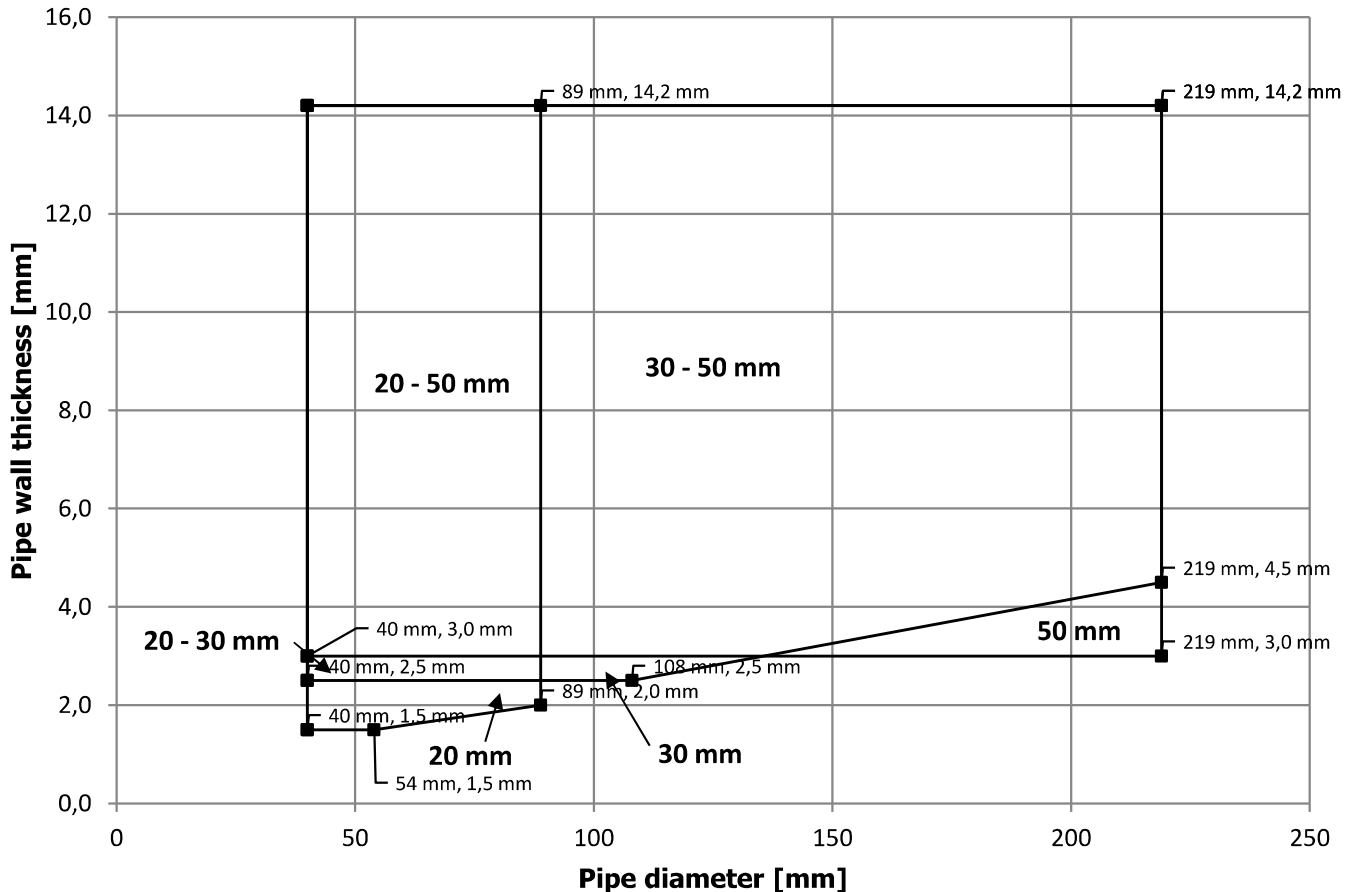
EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Steel and Stainless steel, Cluster



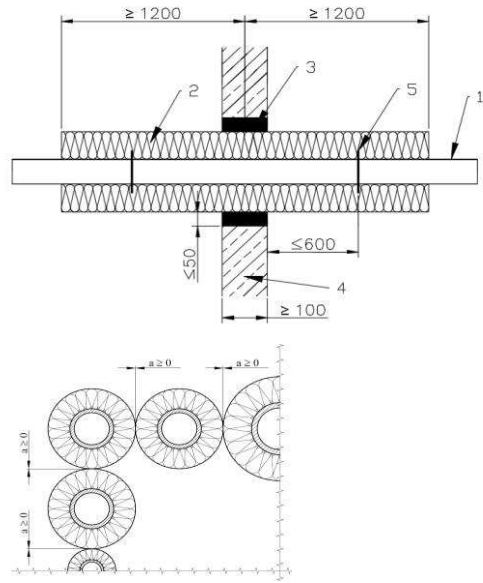
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible wall or Aerated 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



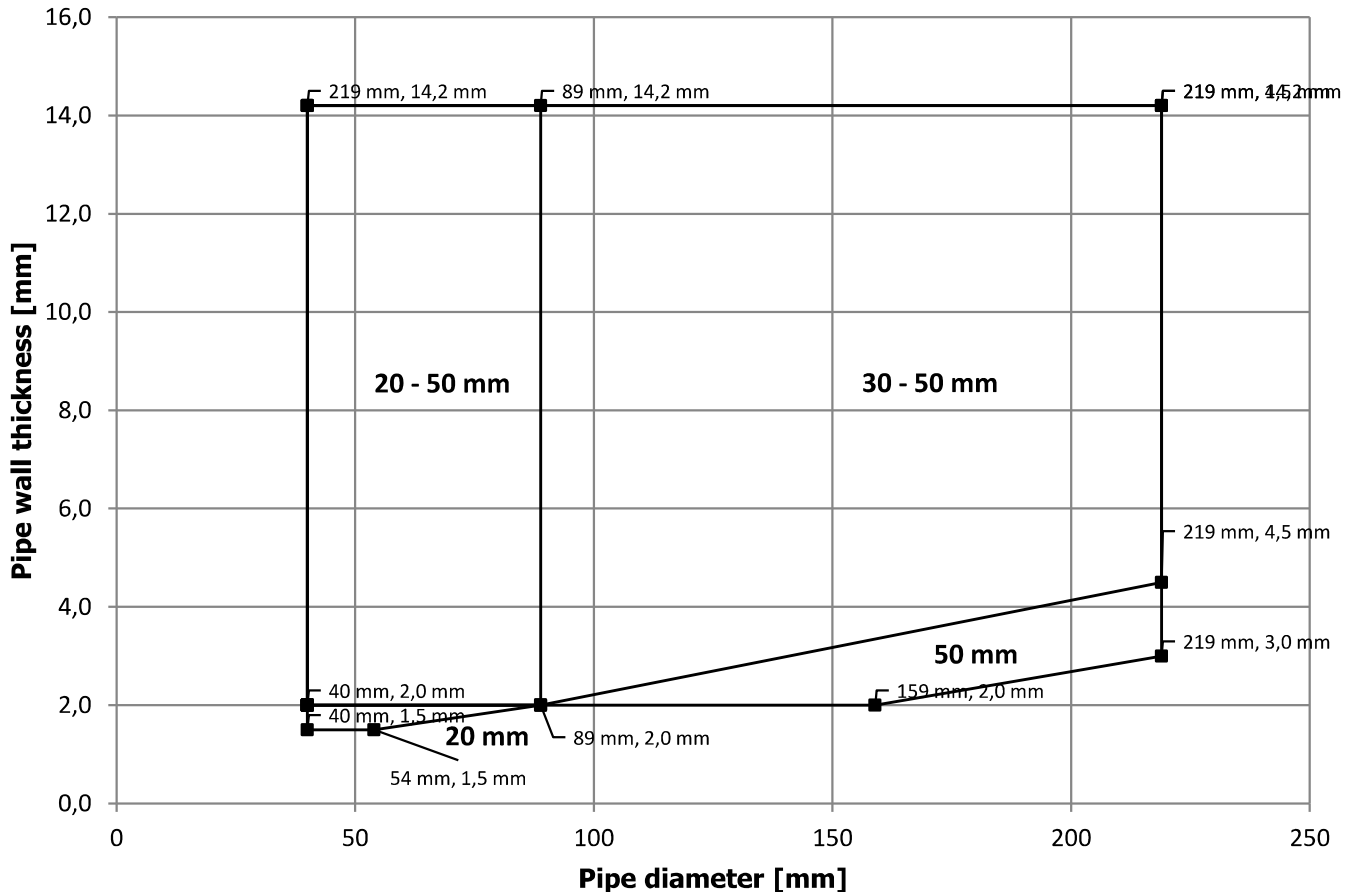
EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained insulation
Stainless steel, Cluster



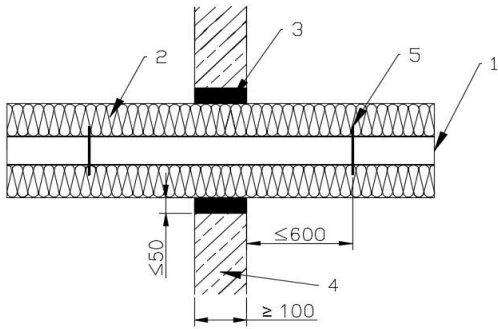
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible wall or Aerated concrete, 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

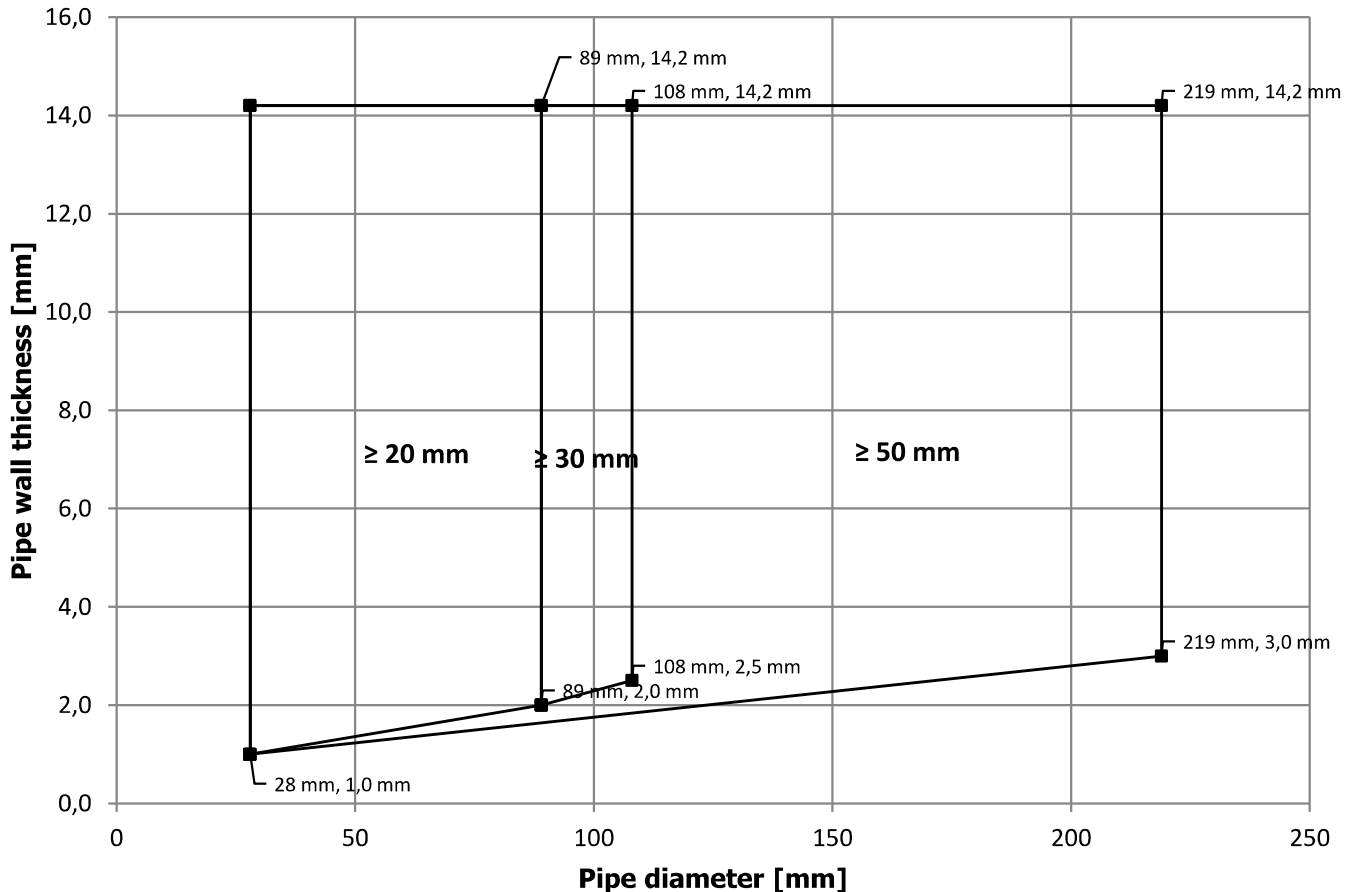


EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

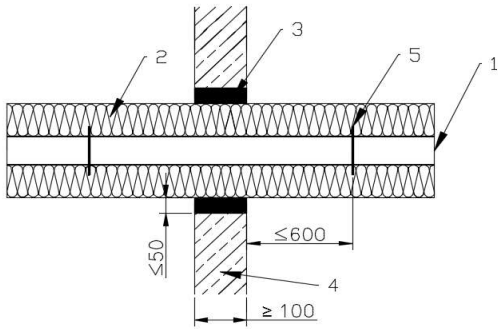


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible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

Field of application for insulation thickness

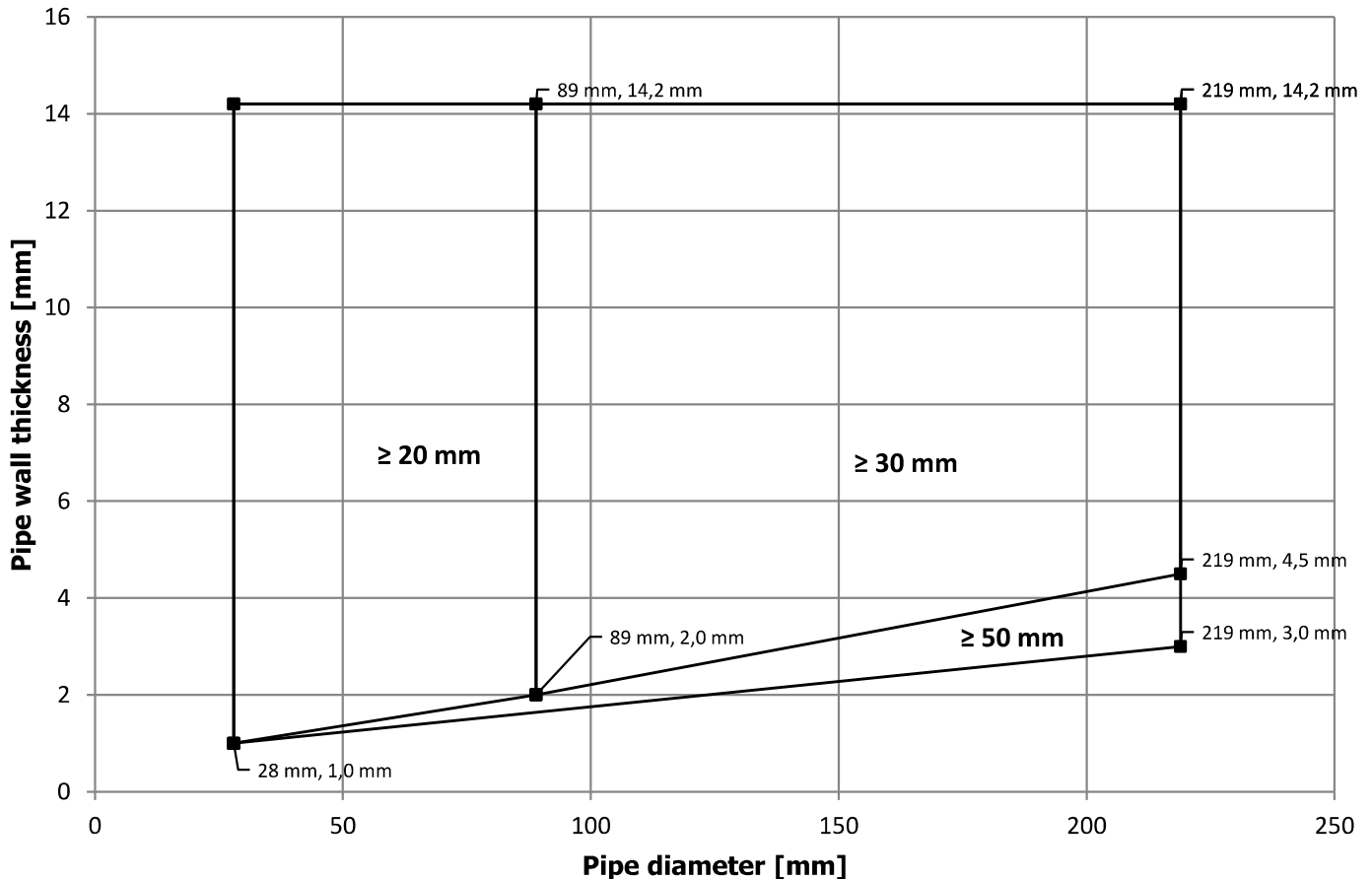


**EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Continued, Sustained insulation
Steel and Stainless steel**

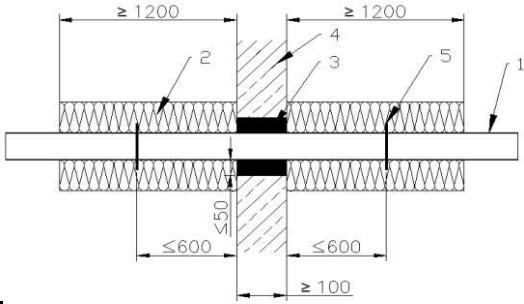


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 4 | Wall | Flexible wall or Aerated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

Field of application for insulation thickness

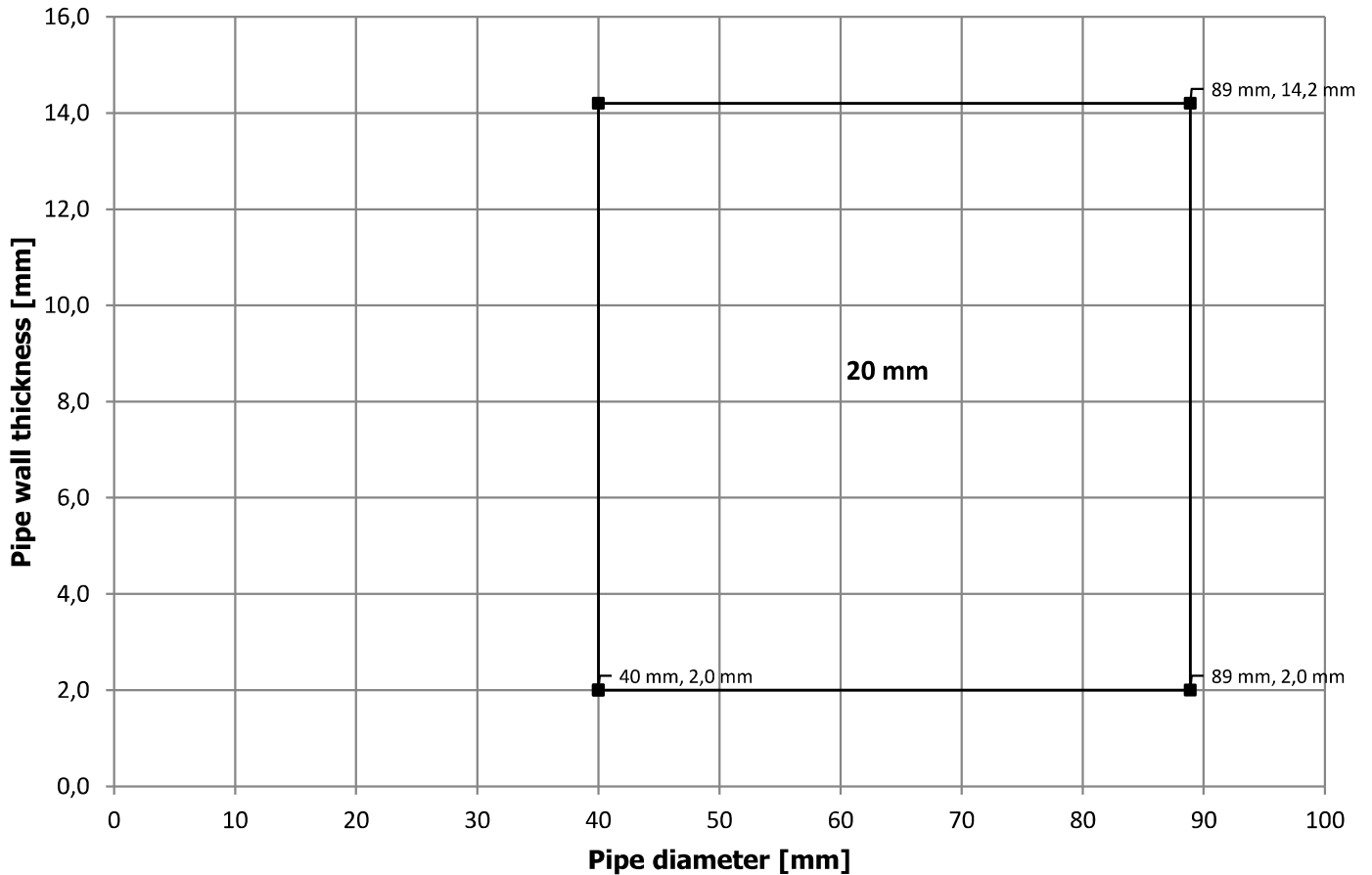


EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local, Interrupted insulation
Copper, Cast iron, Steel and Stainless steel

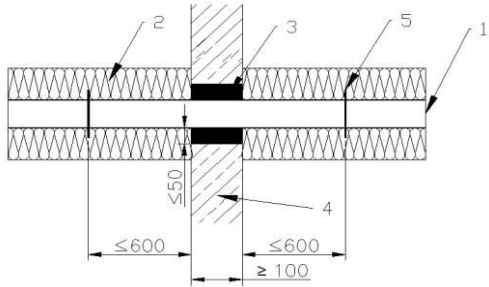


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler Including: 5 mm PE sound insulation strip 3.5 mm Self-adhesive felt stripes |
| 4 | Wall | Flexible wall or Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

Field of application for insulation thickness

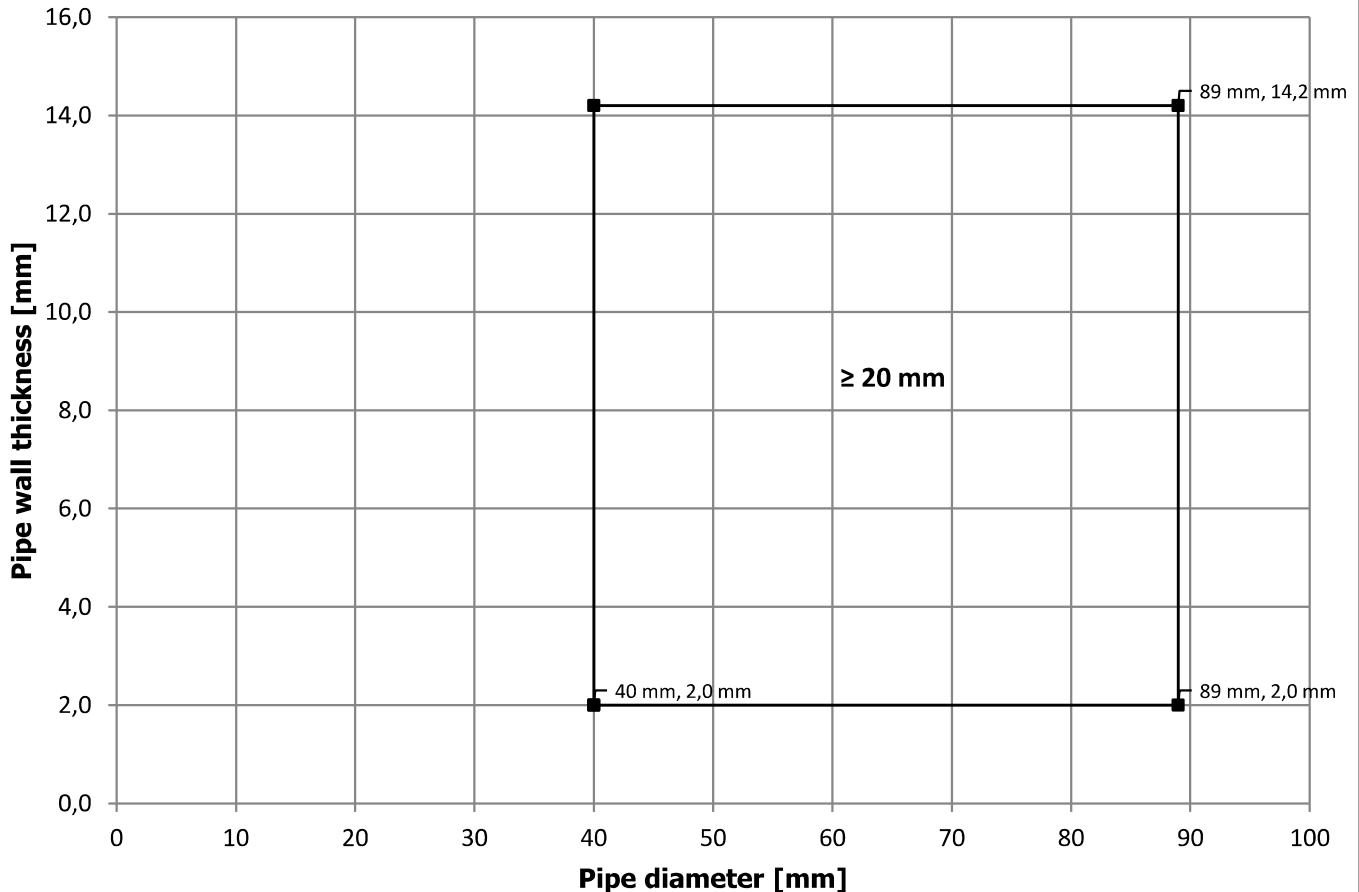


EI90 - Horizontal pipe direction
U Protect Pipe Section Alu2
Continued, Interrupted insulation
Copper, Cast iron, Steel and Stainless steel

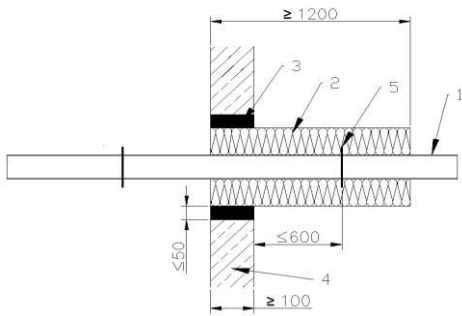


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler Including: 5 mm PE sound insulation strip 3.5 mm Self-adhesive felt stripes |
| 4 | Wall | Flexible wall or Aerated concrete, Concrete or Masonry |
| 5 | Service support | Metal hanger |

Field of application for insulation thickness



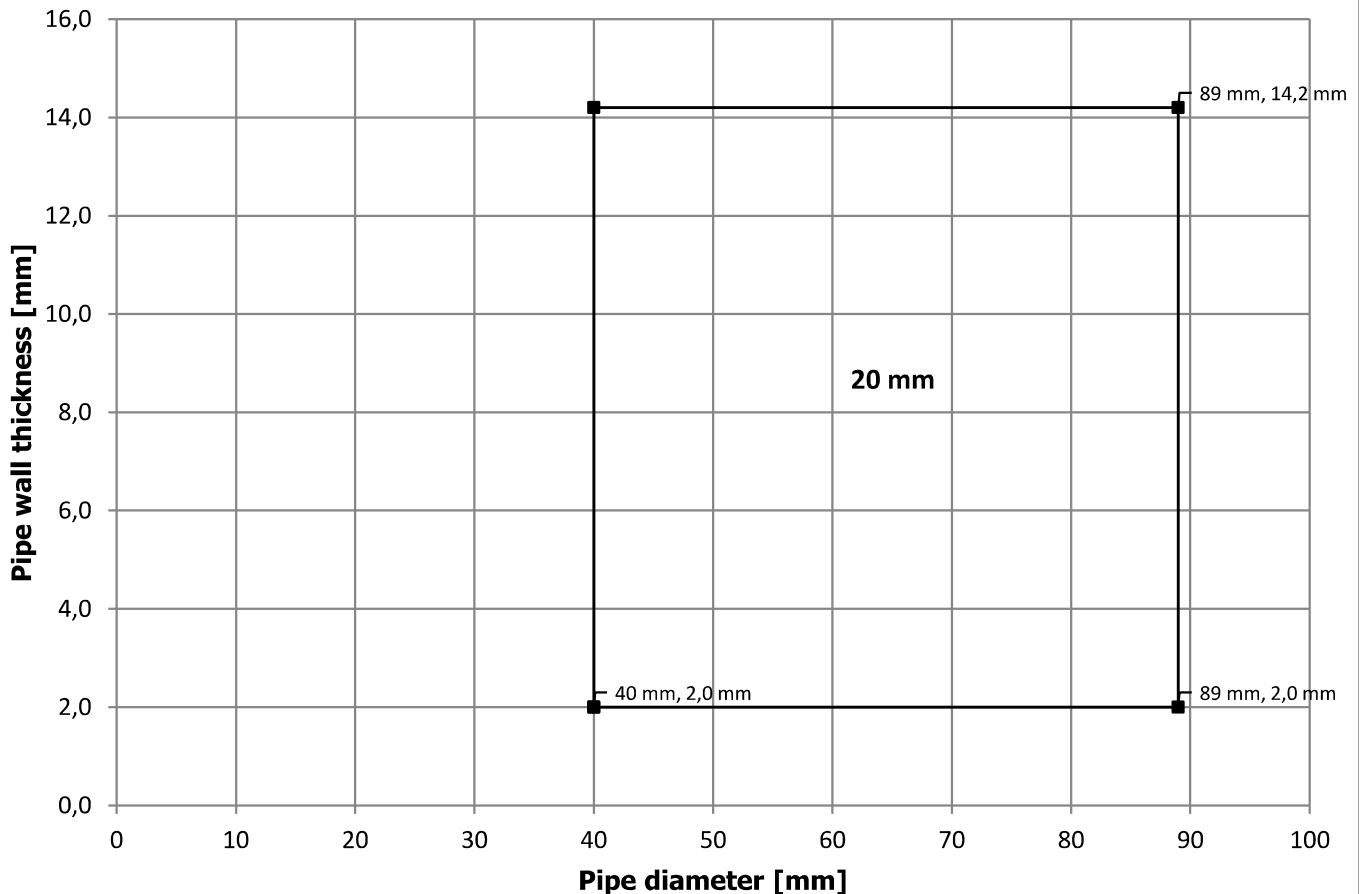
EI30 - Horizontal pipe direction
U Protect Pipe Section Alu2
Local/Continued, Sustained asymmetrical insulation
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar, Concrete or Gypsum filler |
| 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

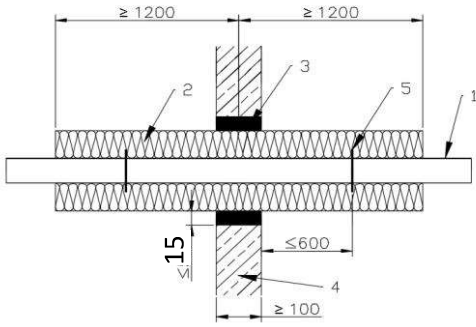


EI90 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, Small gap filling

Copper, Cast iron, Steel and Stainless steel

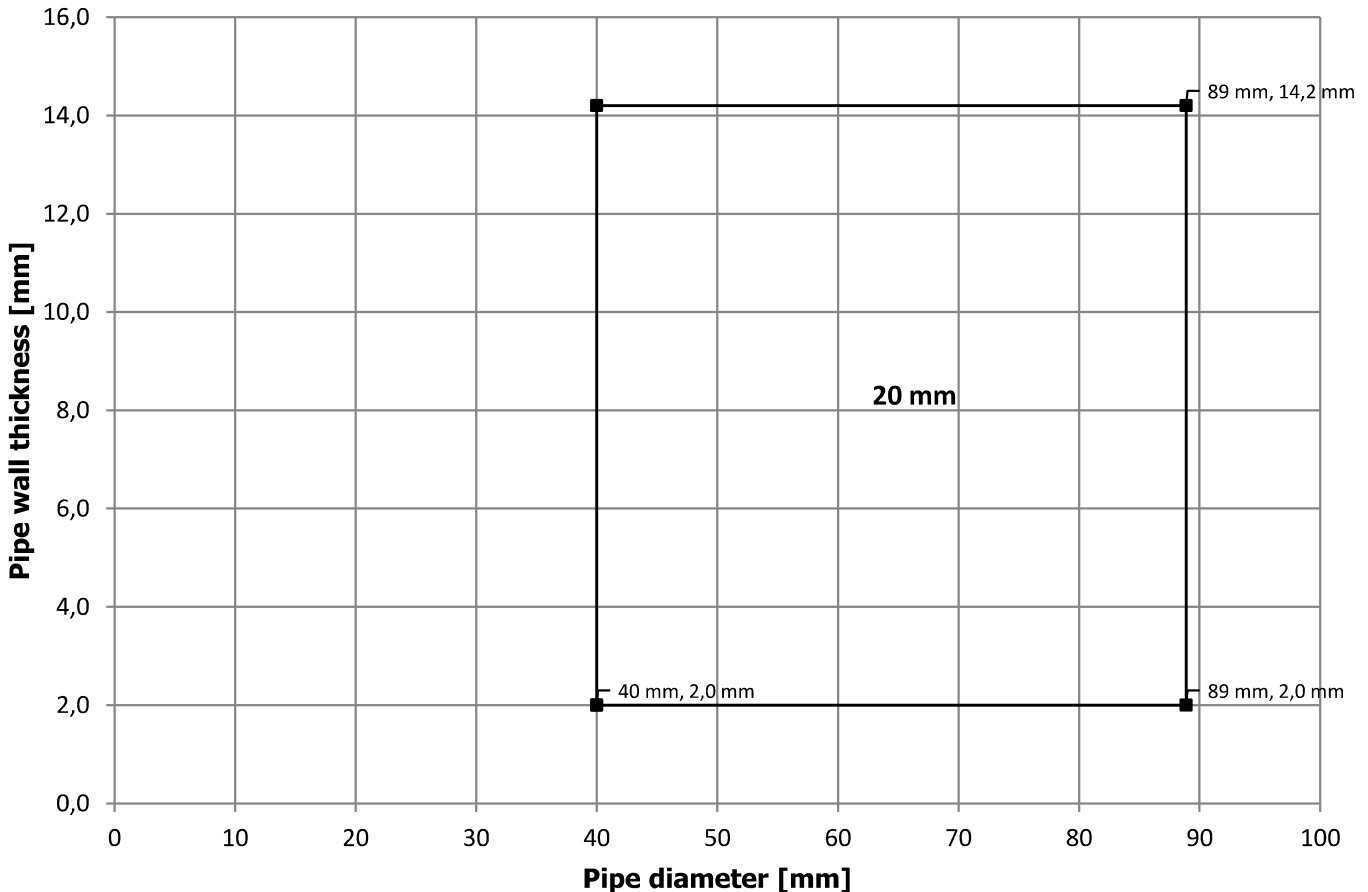


| No. | Item | Description |
|-----|-----------------|---|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap* | Filled with Protect BSK, PROMASEAL-Mastic, Pyro-Safe Flammoplast KS3 or SIBRALIT DX in a depth of ≥ 25 mm from both sides. |
| 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

*Gap size up to 15mm. In between the filling can be a void or a Euroclass E filling

Field of application for insulation thickness

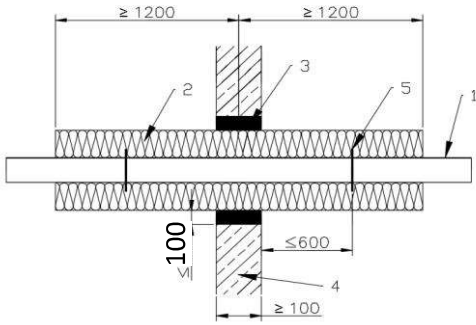


EI120 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, 100 mm residual gap

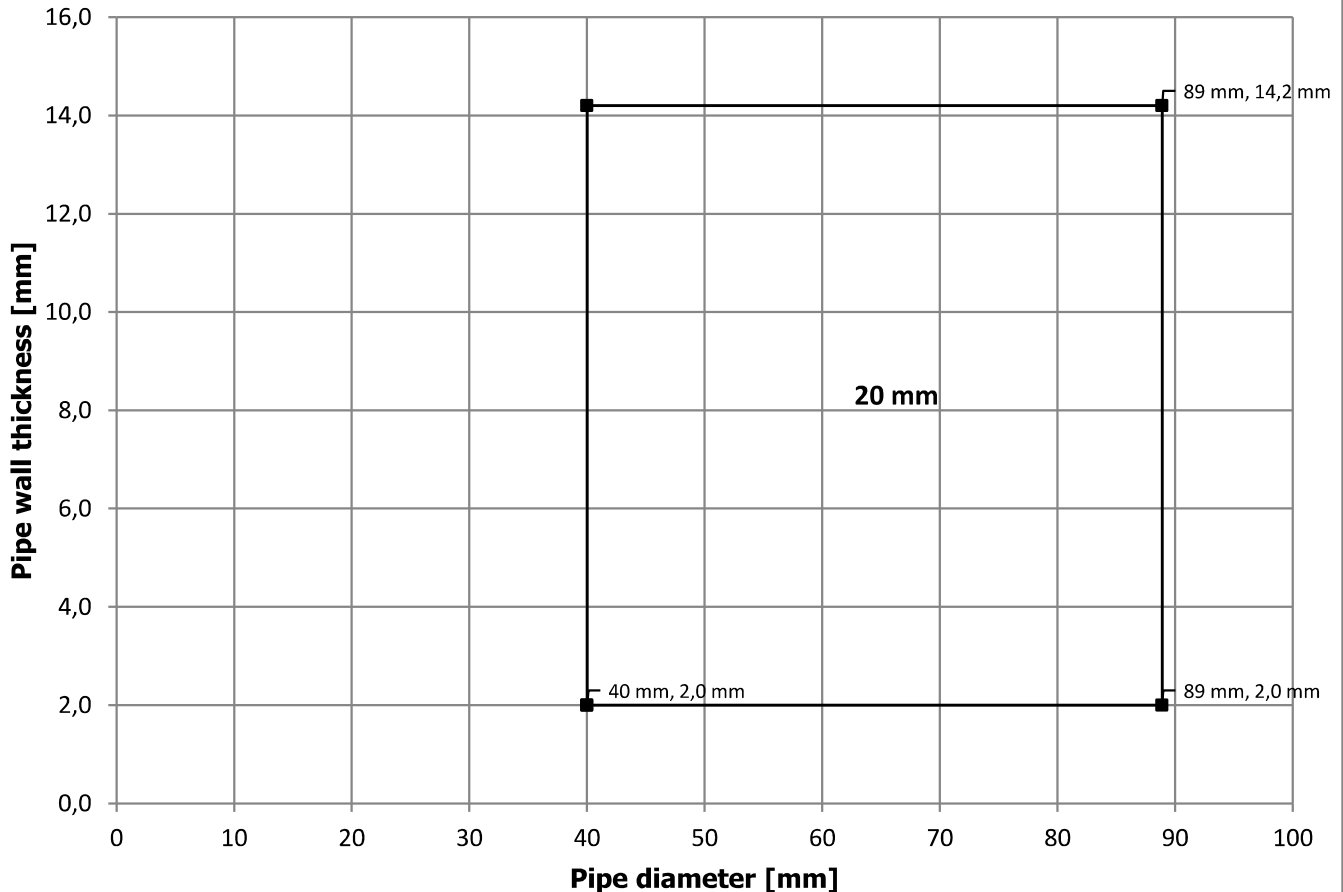
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | 100 mm filled with Mortar, Concrete or Gypsum filler |
| 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

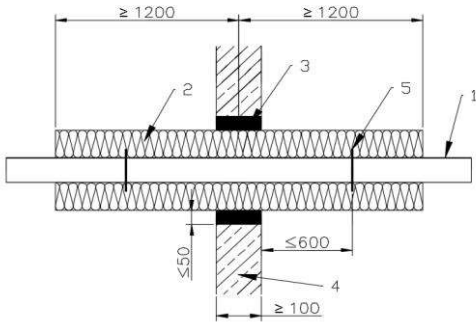


EI60 - Horizontal pipe direction

U Protect Pipe Section Alu2

Local/Continued, Sustained insulation, Compress insulation

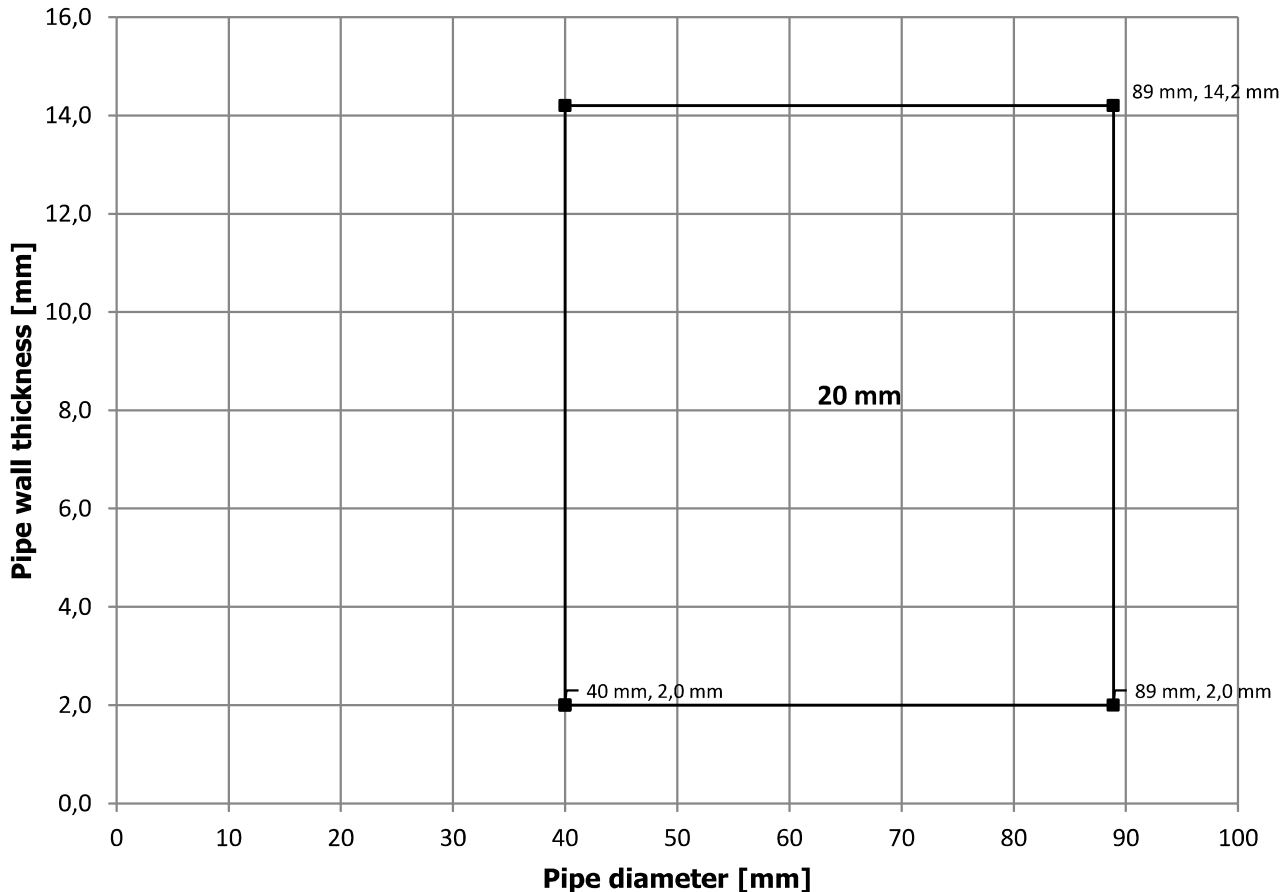
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|---------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Pipe Section Alu2 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with loose Stone wool crompressed to 100 kg/m ³ |
| 4 | Wall | Flexible wall or Aerated concrete, Concrete or Masonry |
| 5 | Service suppo | Metal hanger |

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

Field of application for insulation thickness

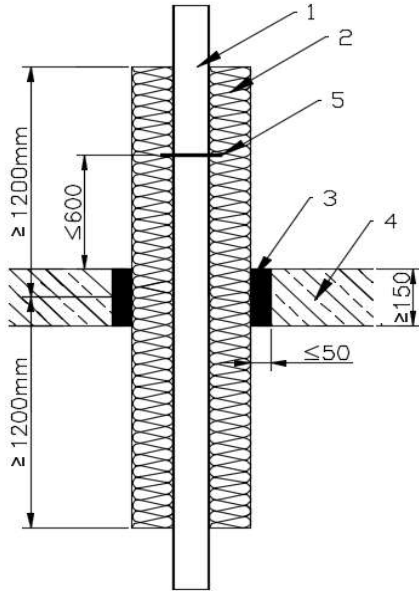


EI120 - Vertical pipe direction

U Protect Roll 3.1 Alu1

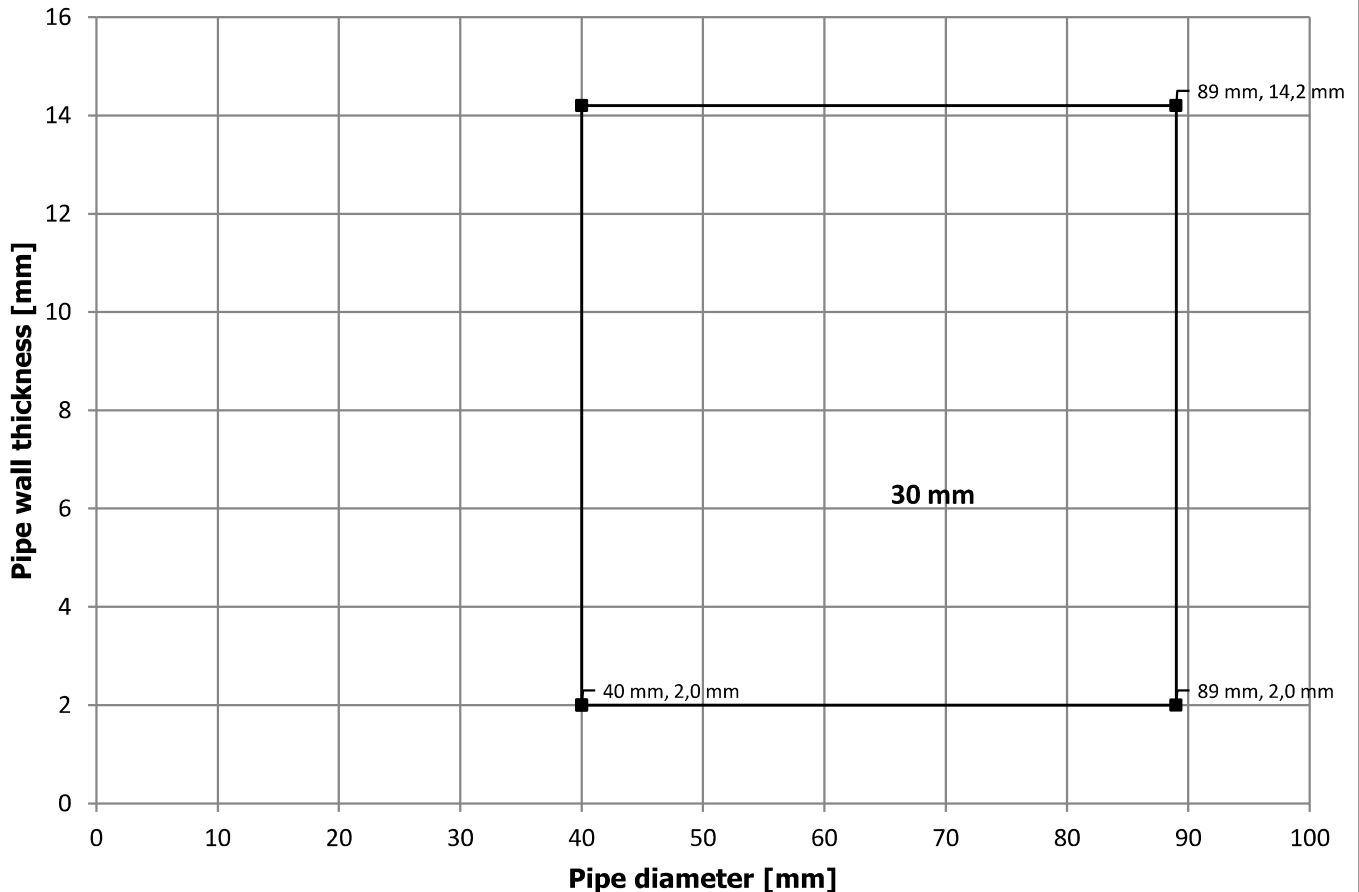
Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

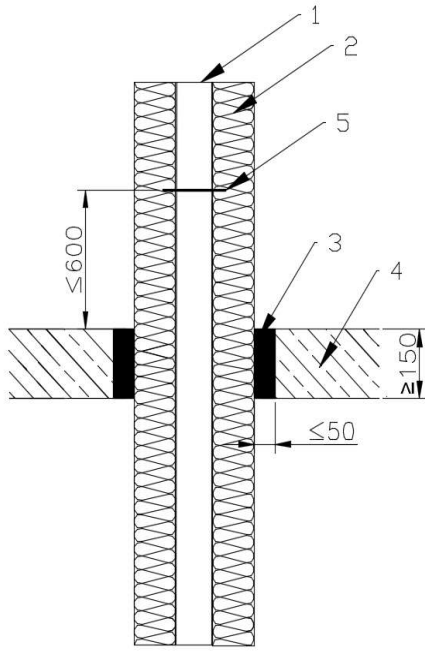


EI120 - Vertical pipe direction

U Protect Roll 3.1 Alu1

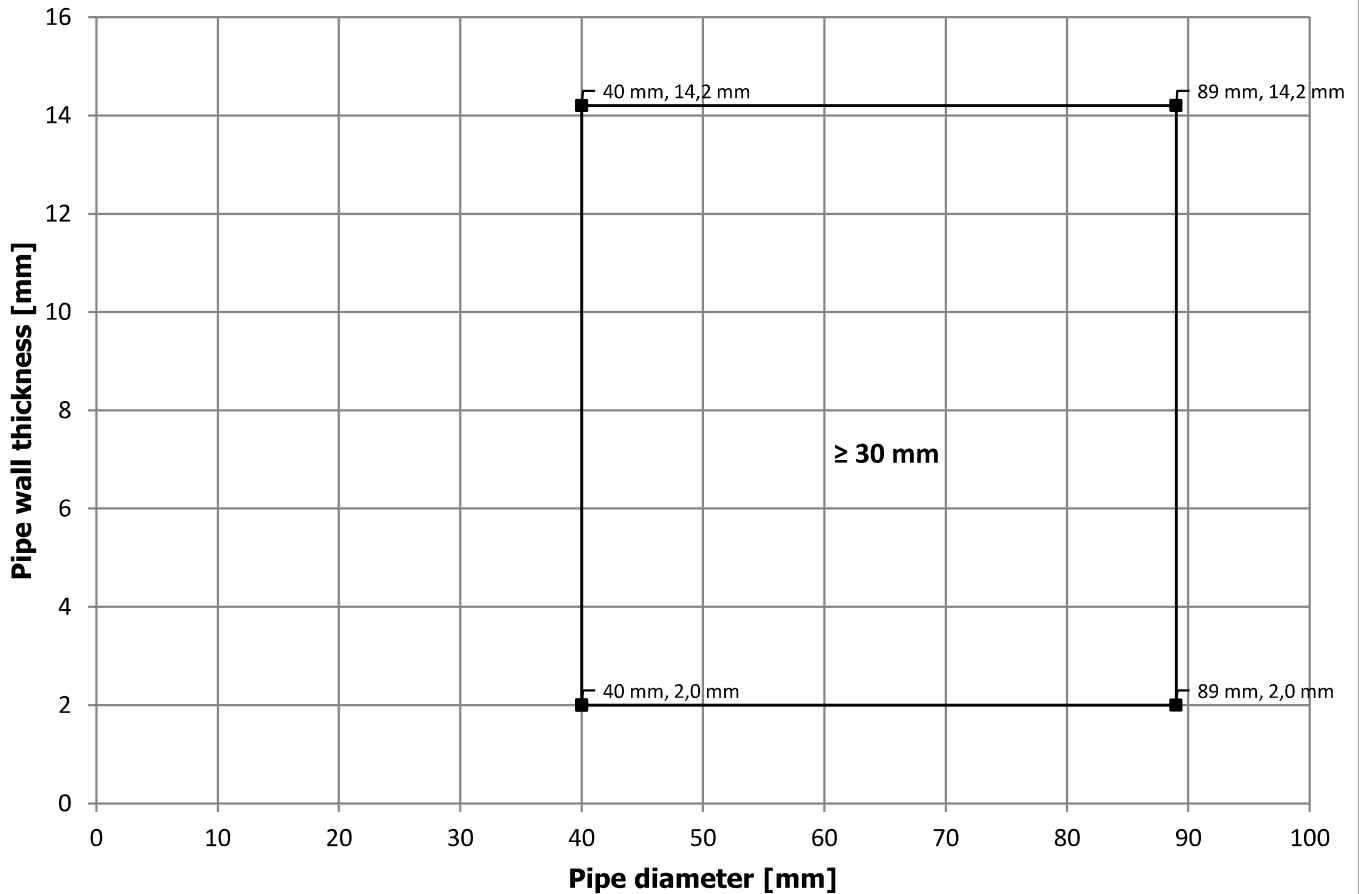
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

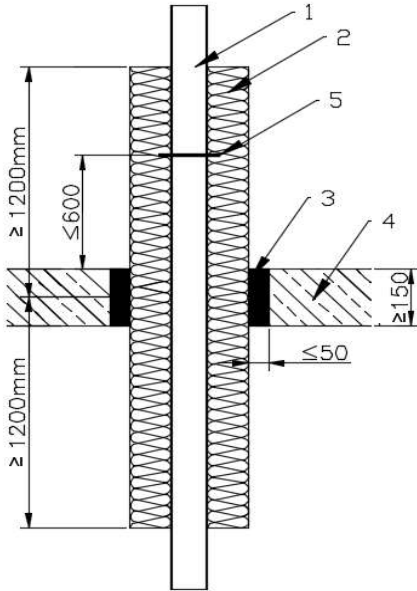


EI60 - Vertical pipe direction

U Protect Roll 3.1 Alu1

Local, Sustained insulation

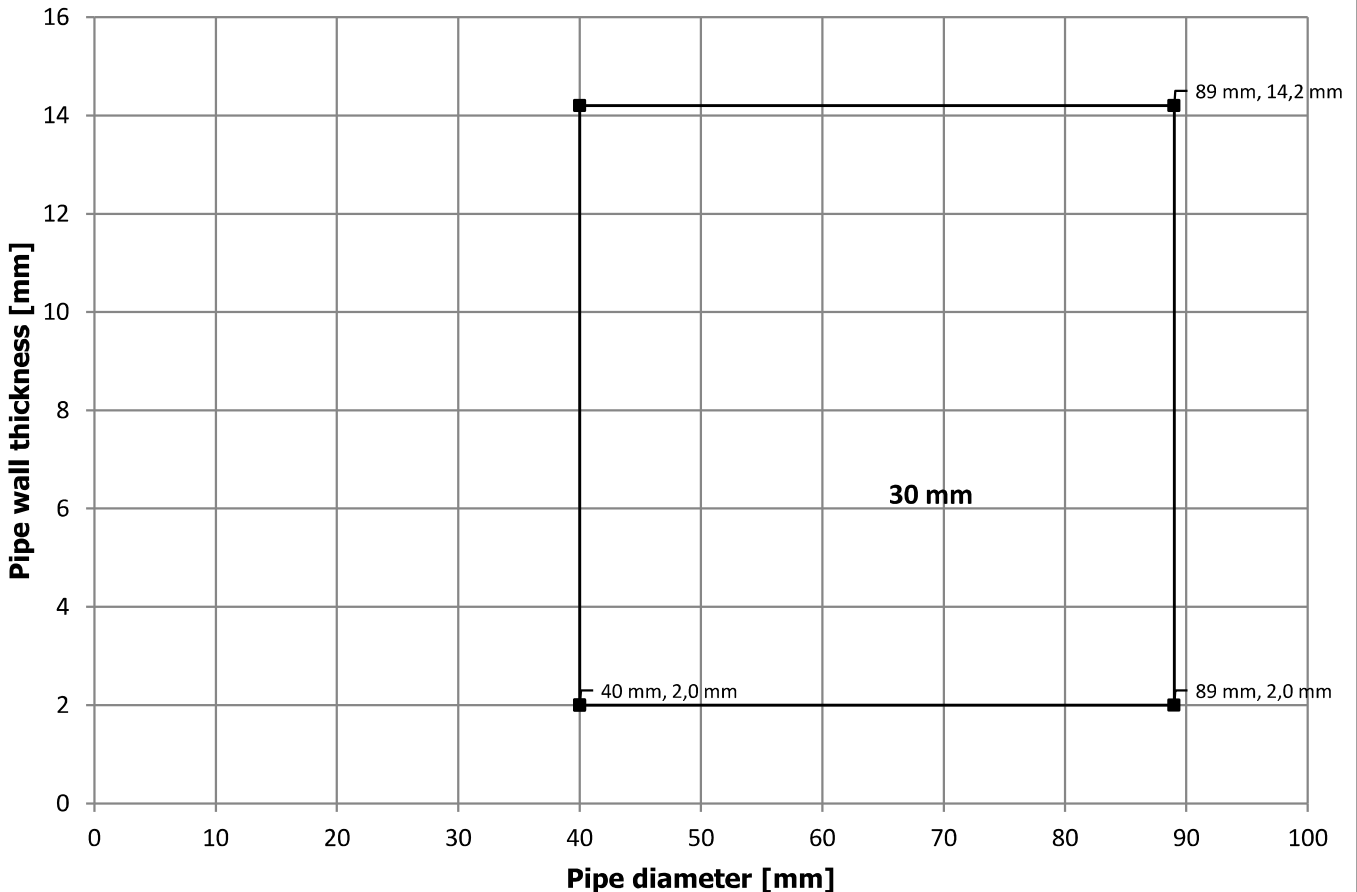
Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

Field of application for insulation thickness

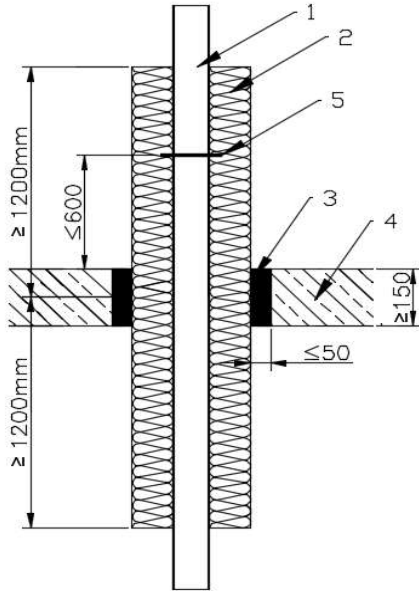


EI60 - Vertical pipe direction

U Protect Roll 3.1 Alu1

Local, Sustained insulation

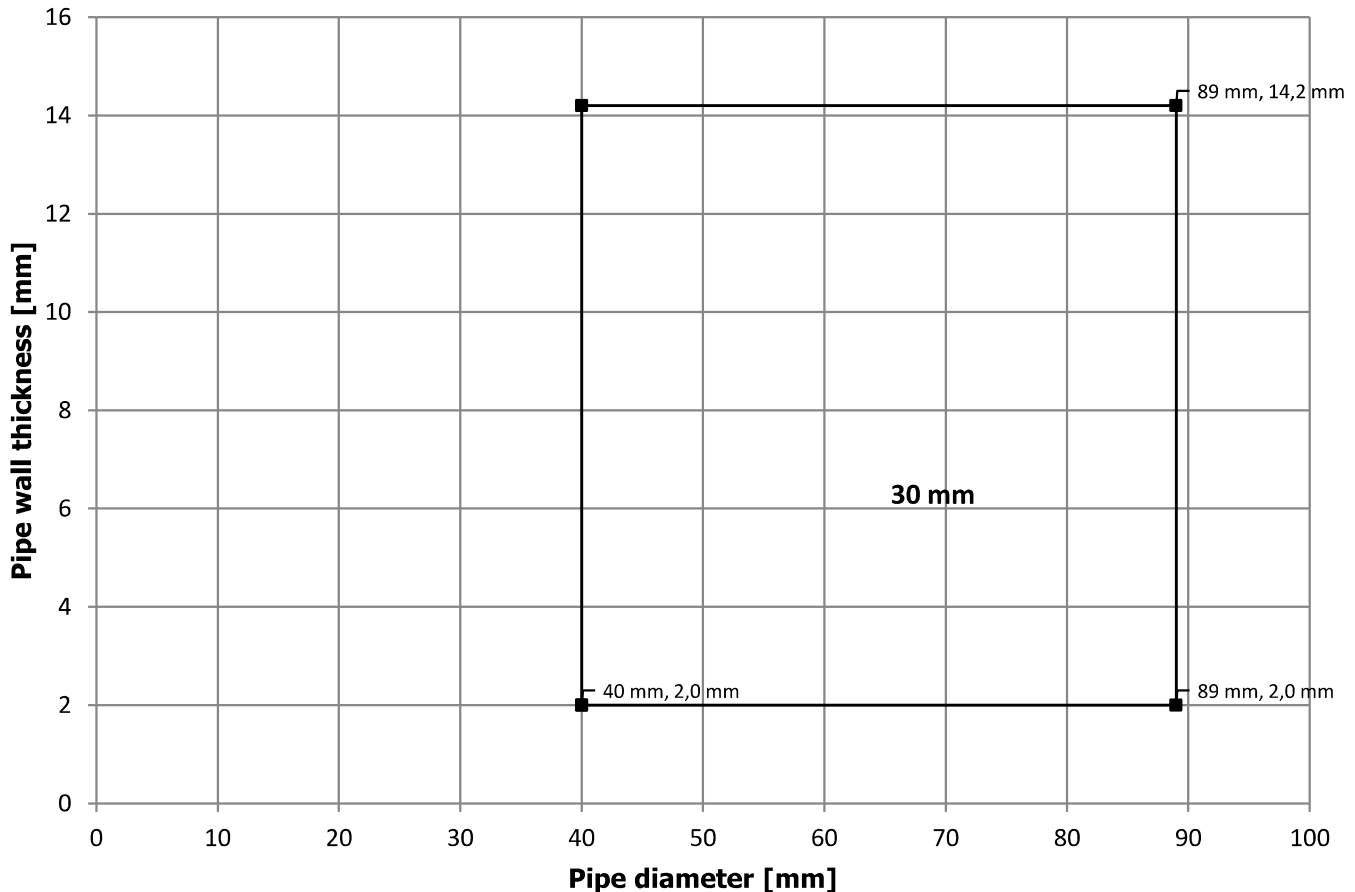
Stainless steel



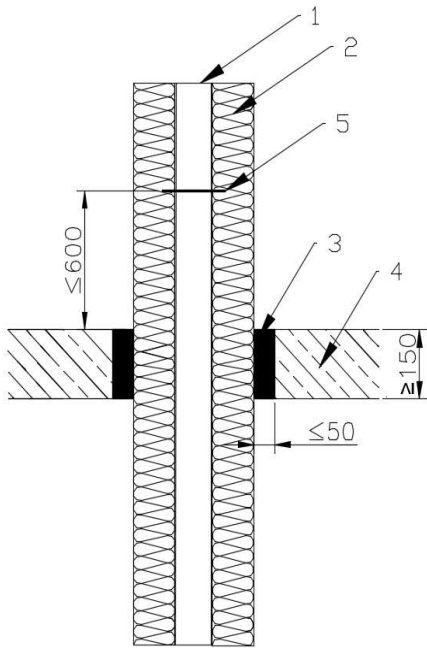
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service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

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

Field of application for insulation thickness

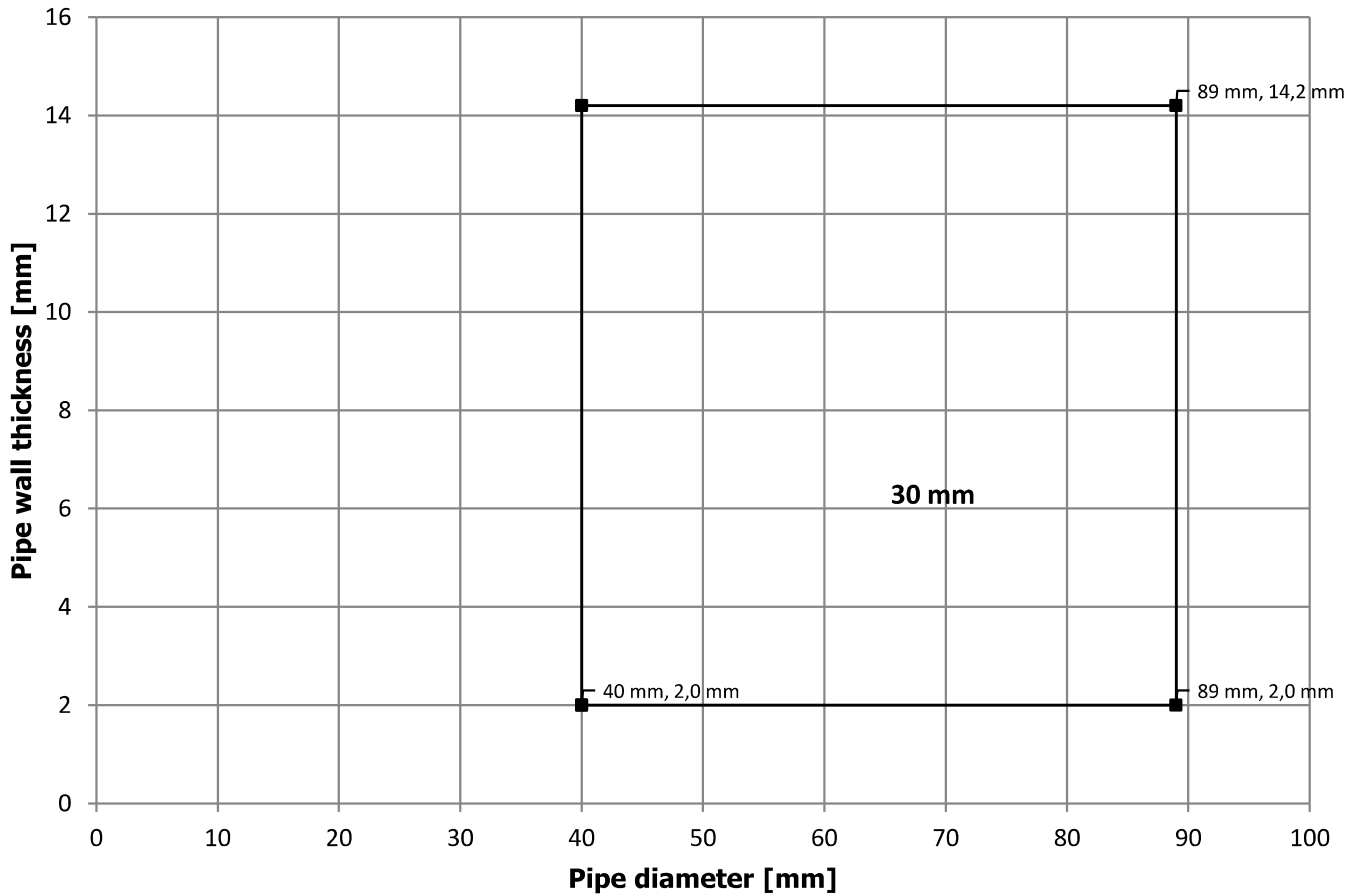


EI120 - Vertical pipe direction
U Protect Roll 3.1 Alu1
Continued, Sustained insulation
Stainless steel

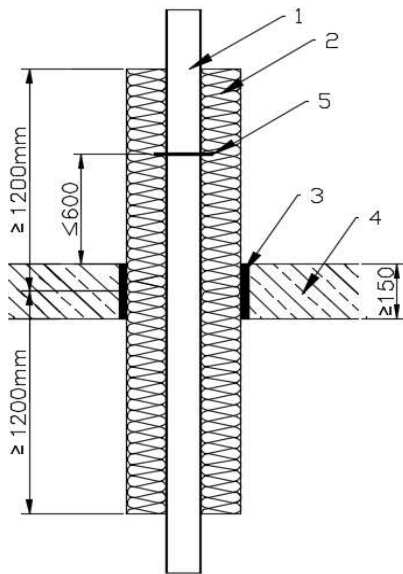


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service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

Field of application for insulation thickness



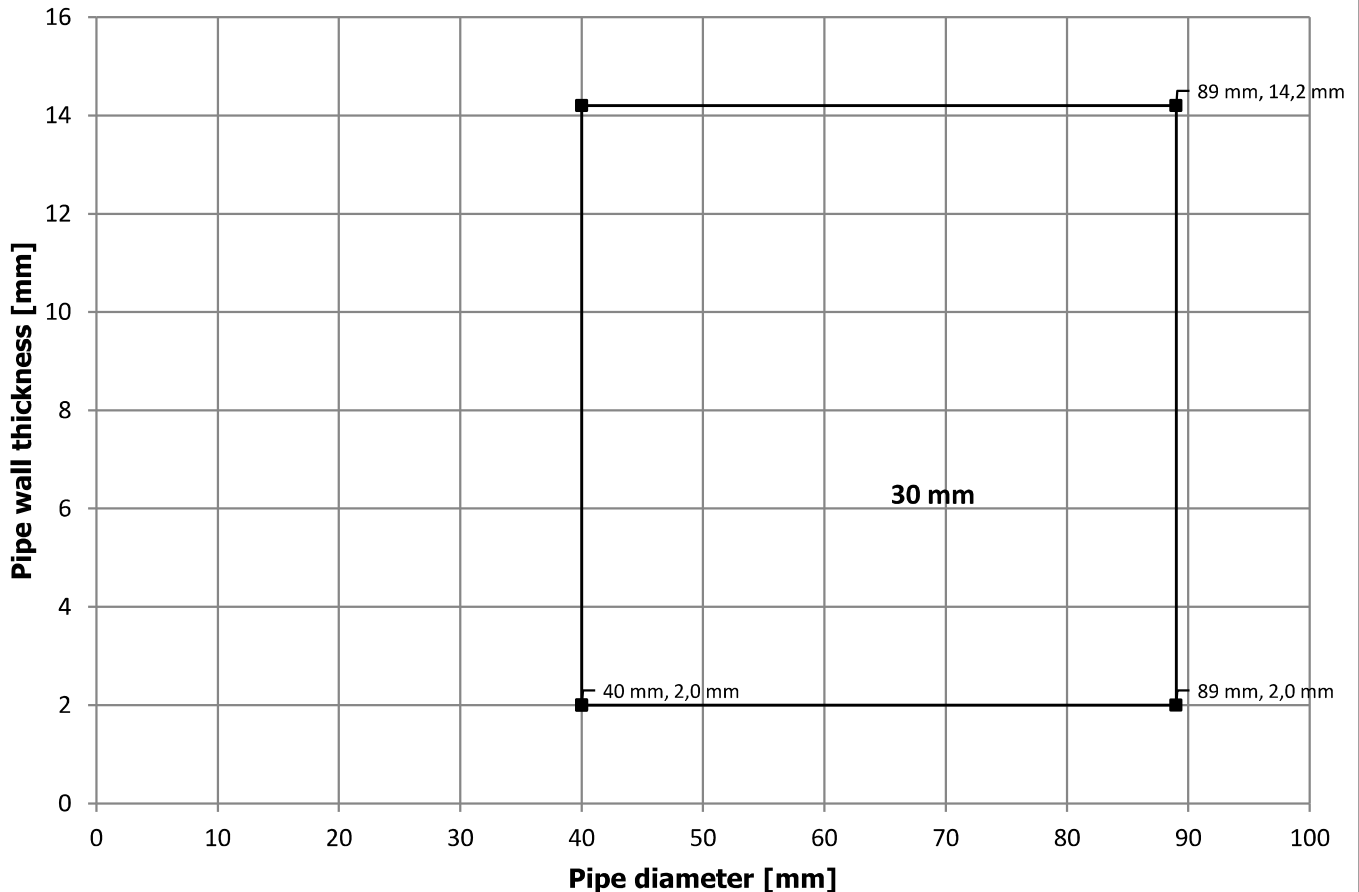
EI30 - Vertical pipe direction
U Protect Roll 3.1 Alu1
Local/Continued, Sustained insulation
Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

Field of application for insulation thickness

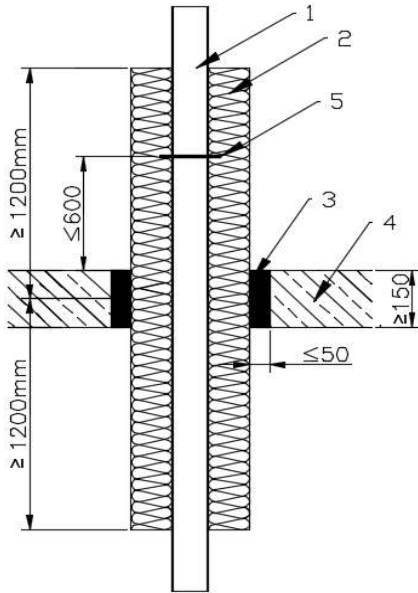


EI90 - Vertical pipe direction

U Protect Roll 3.1 Alu1

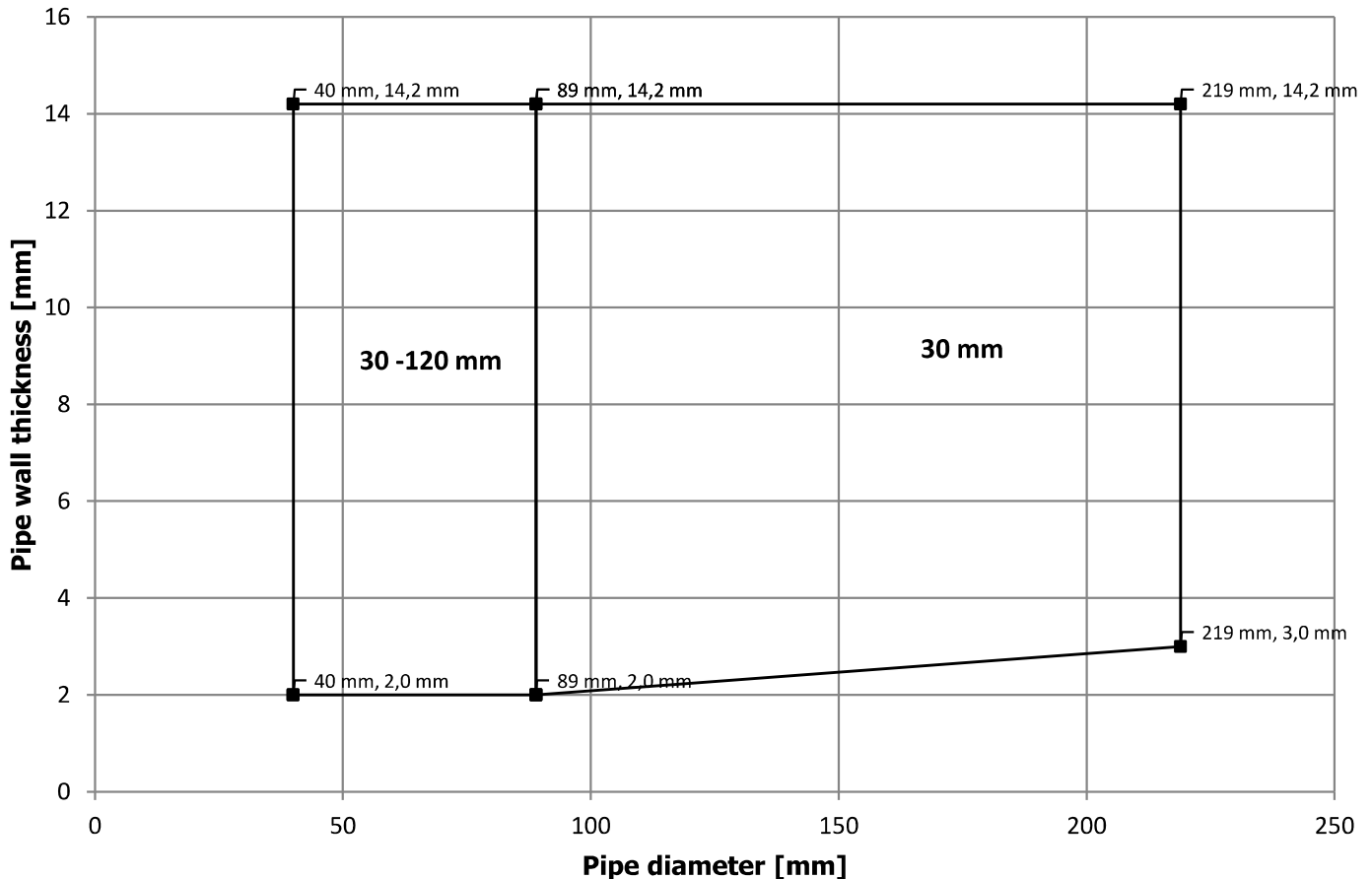
Local, Sustained insulation

Copper, Cast iron, Steel and Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

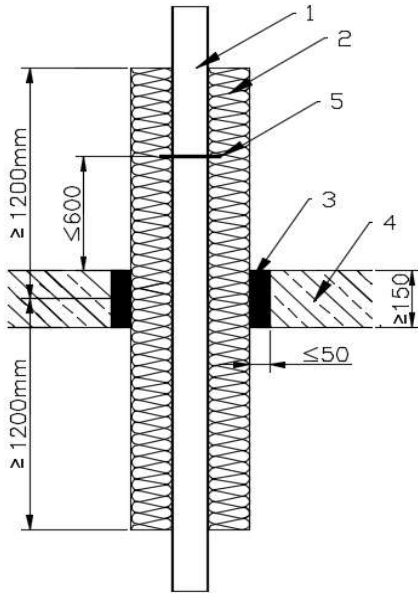


EI90 - Vertical pipe direction

U Protect Roll 3.1 Alu1

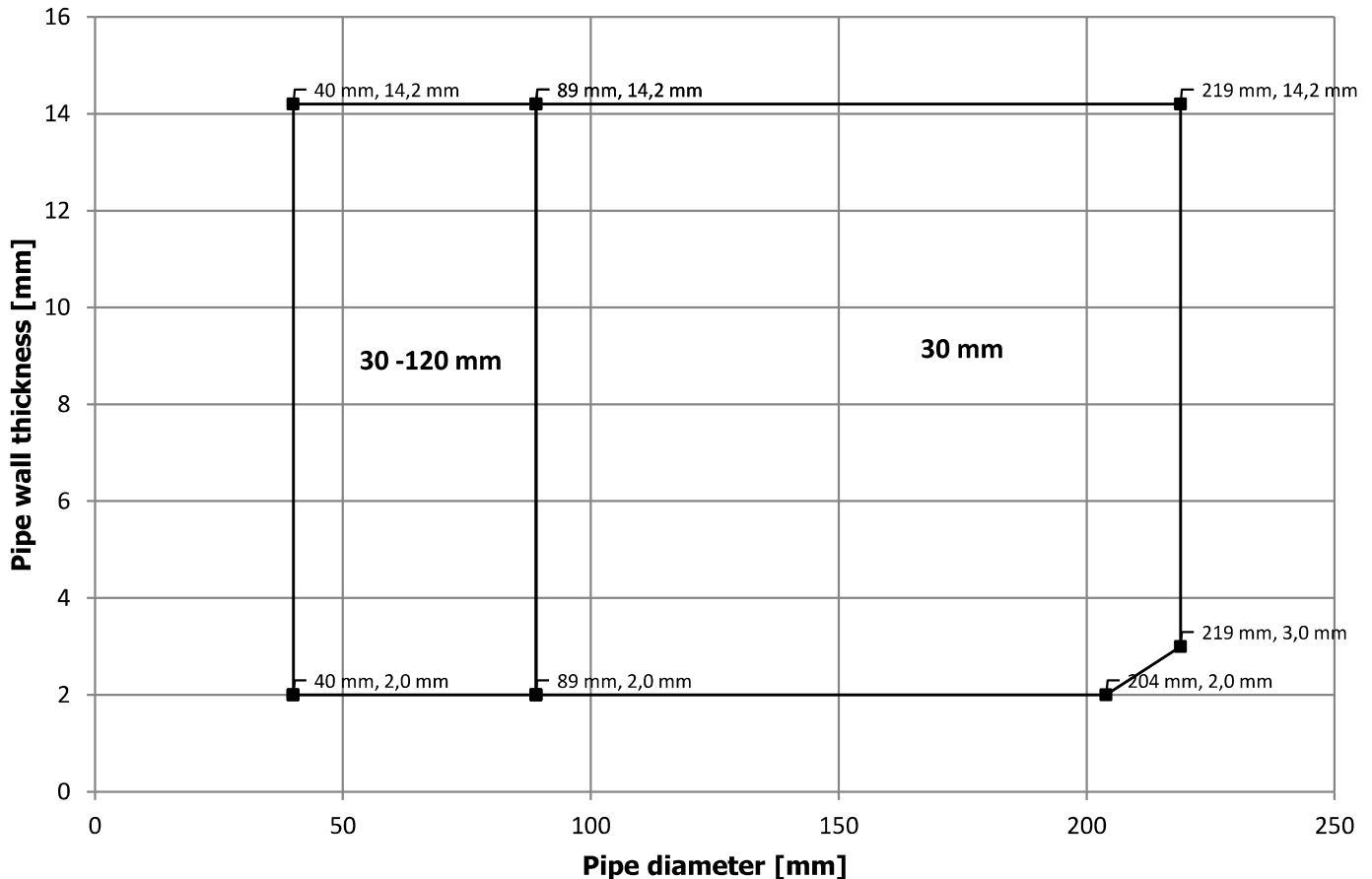
Local, Sustained insulation

Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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

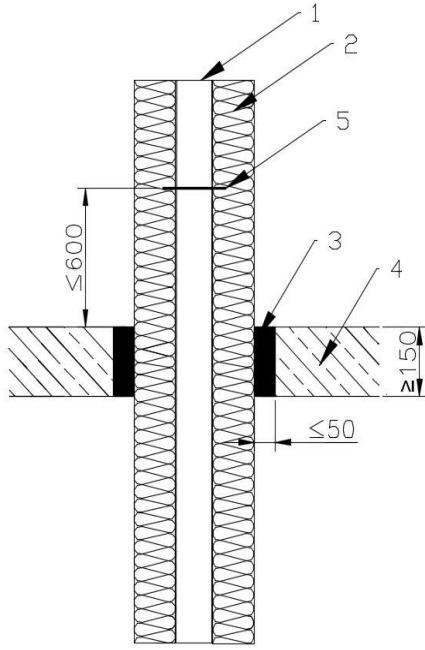


EI90 - Vertical pipe direction

U Protect Roll 3.1 Alu1

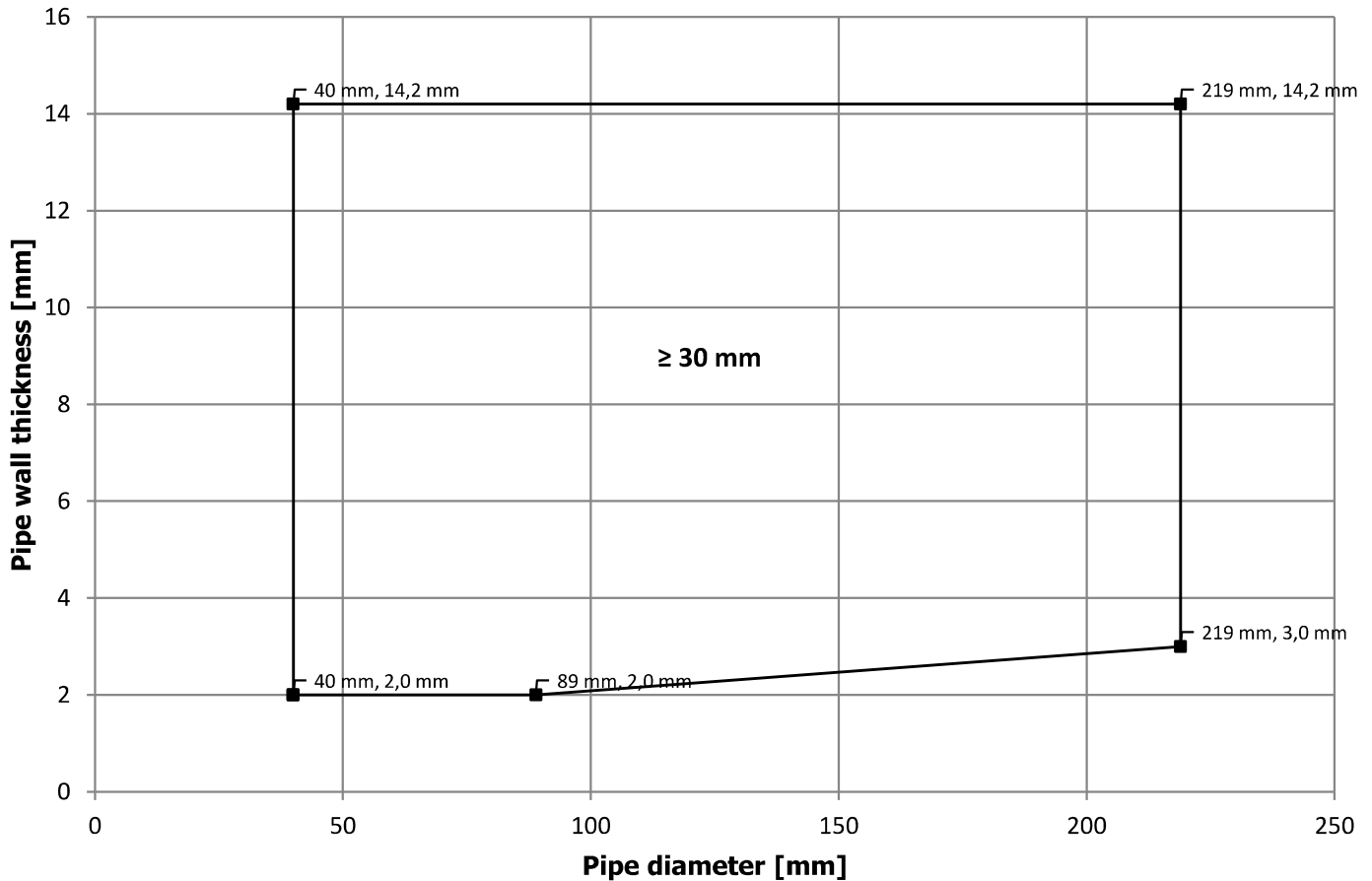
Continued, Sustained insulation

Copper, Cast iron, Steel and Stainless steel

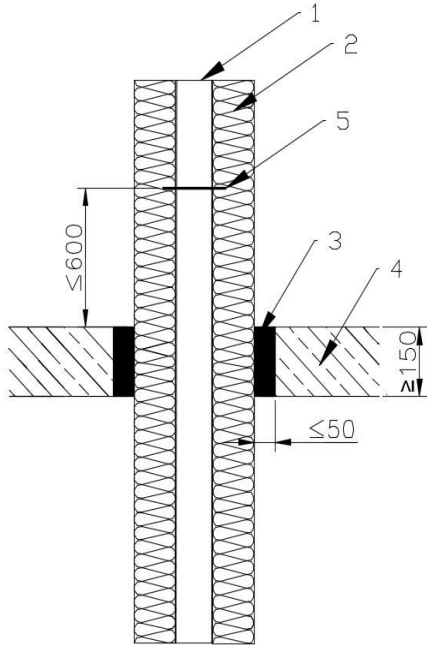


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete,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

Field of application for insulation thickness

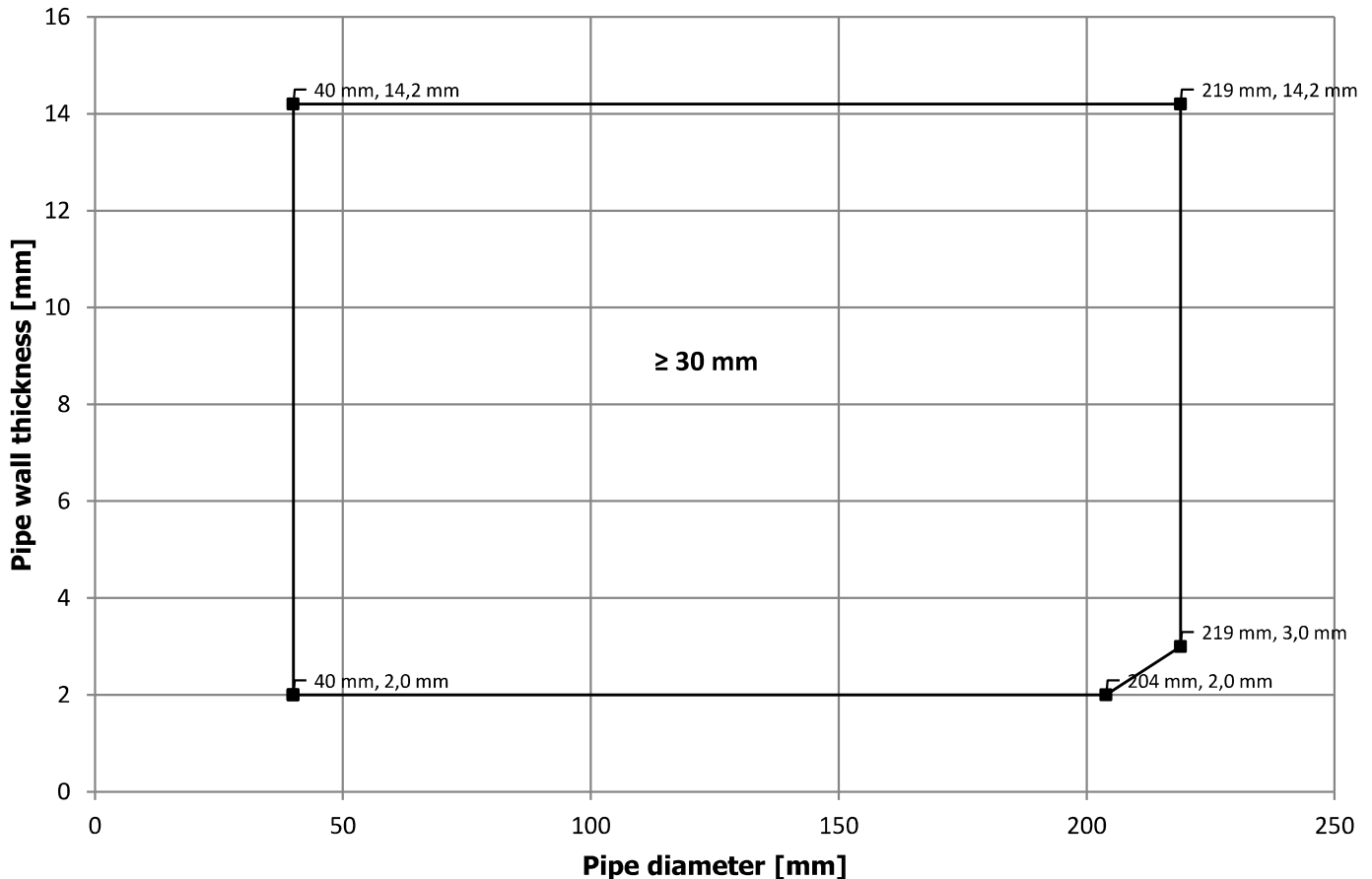


EI90 - Vertical pipe direction
U Protect Roll 3.1 Alu1
Continued, Sustained insulation
Stainless steel

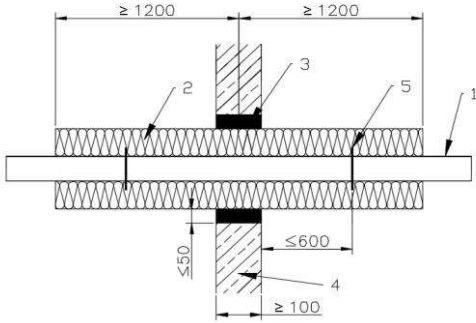


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Ceiling | Aerated concrete, Concrete or Masonry |
| 5 | Service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

Field of application for insulation thickness

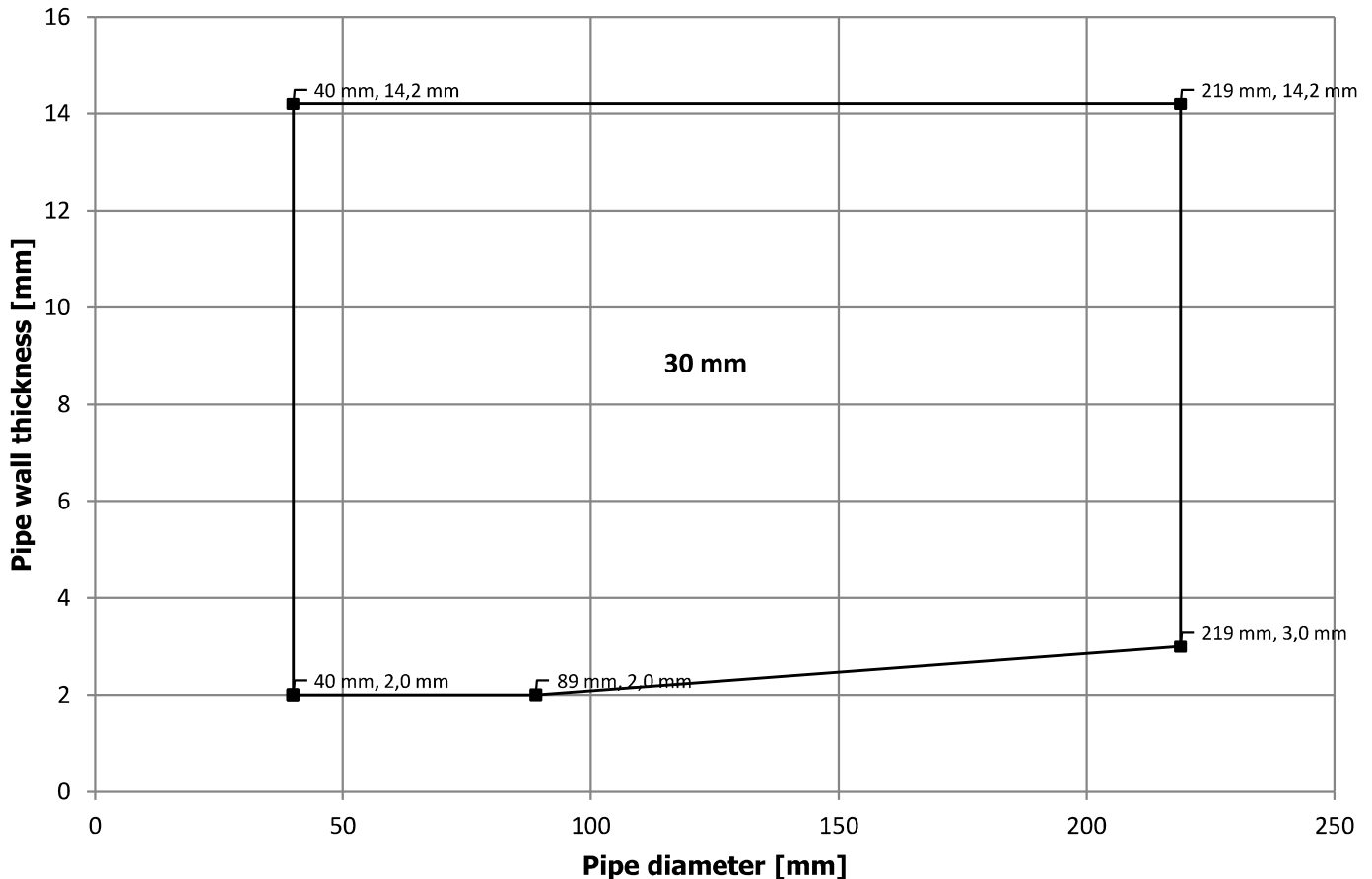


EI90 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Local, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

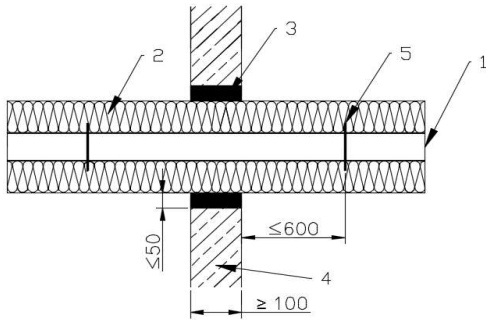


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Wall | Flexible wall or Aerated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

Field of application for insulation thickness

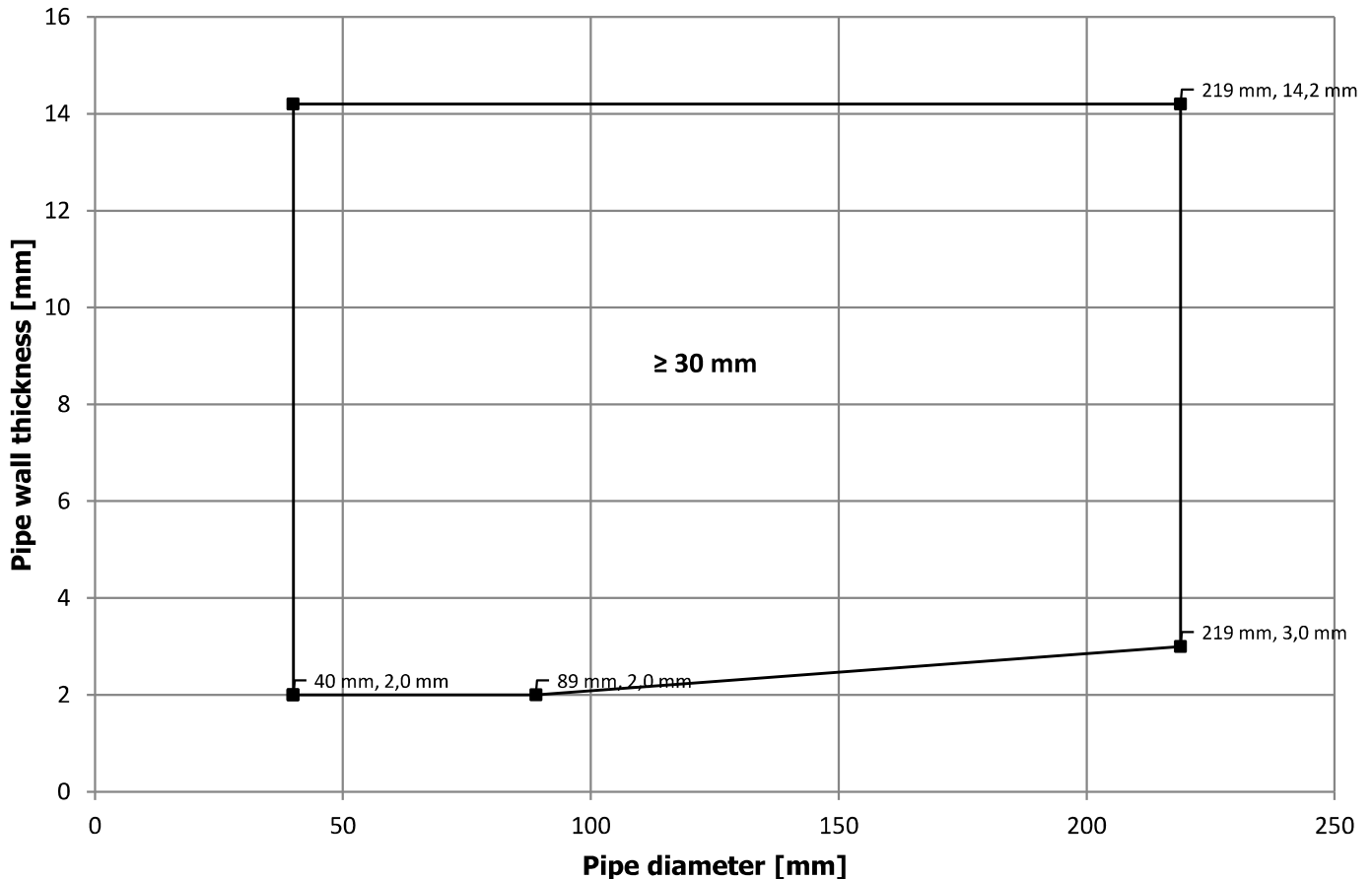


EI90 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel

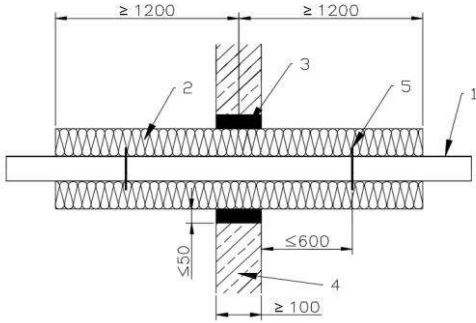


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Wall | Flexible wall or Aerated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

Field of application for insulation thickness



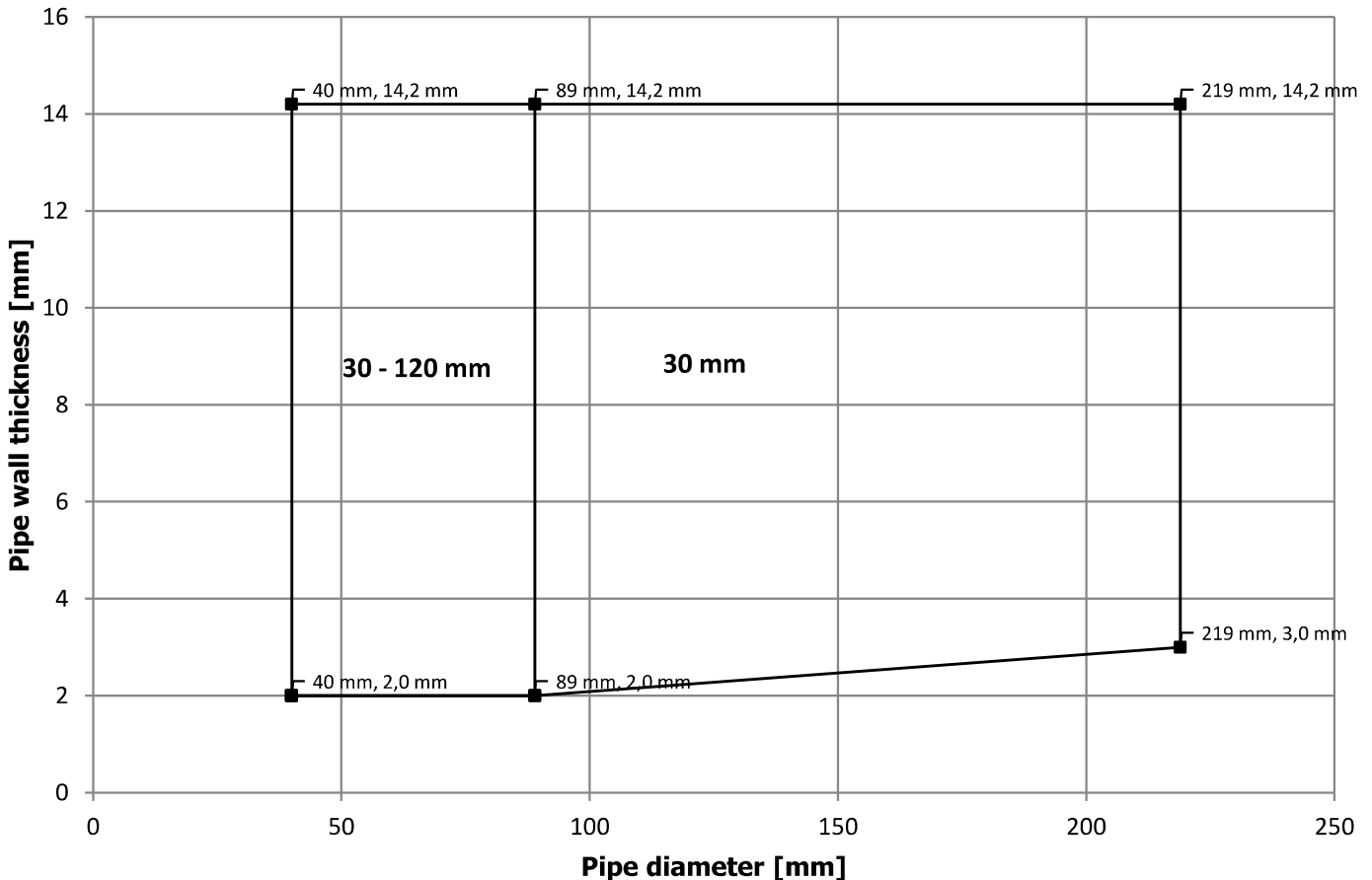
EI60 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Local/Continued, Sustained insulation
Copper, Cast iron, Steel and Stainless steel



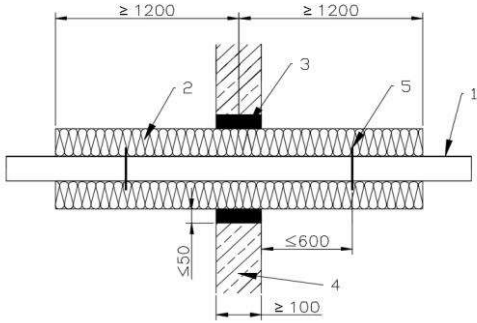
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Copper, Cast iron, Steel and Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Wall | Flexible wall or Aerated 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 thickness



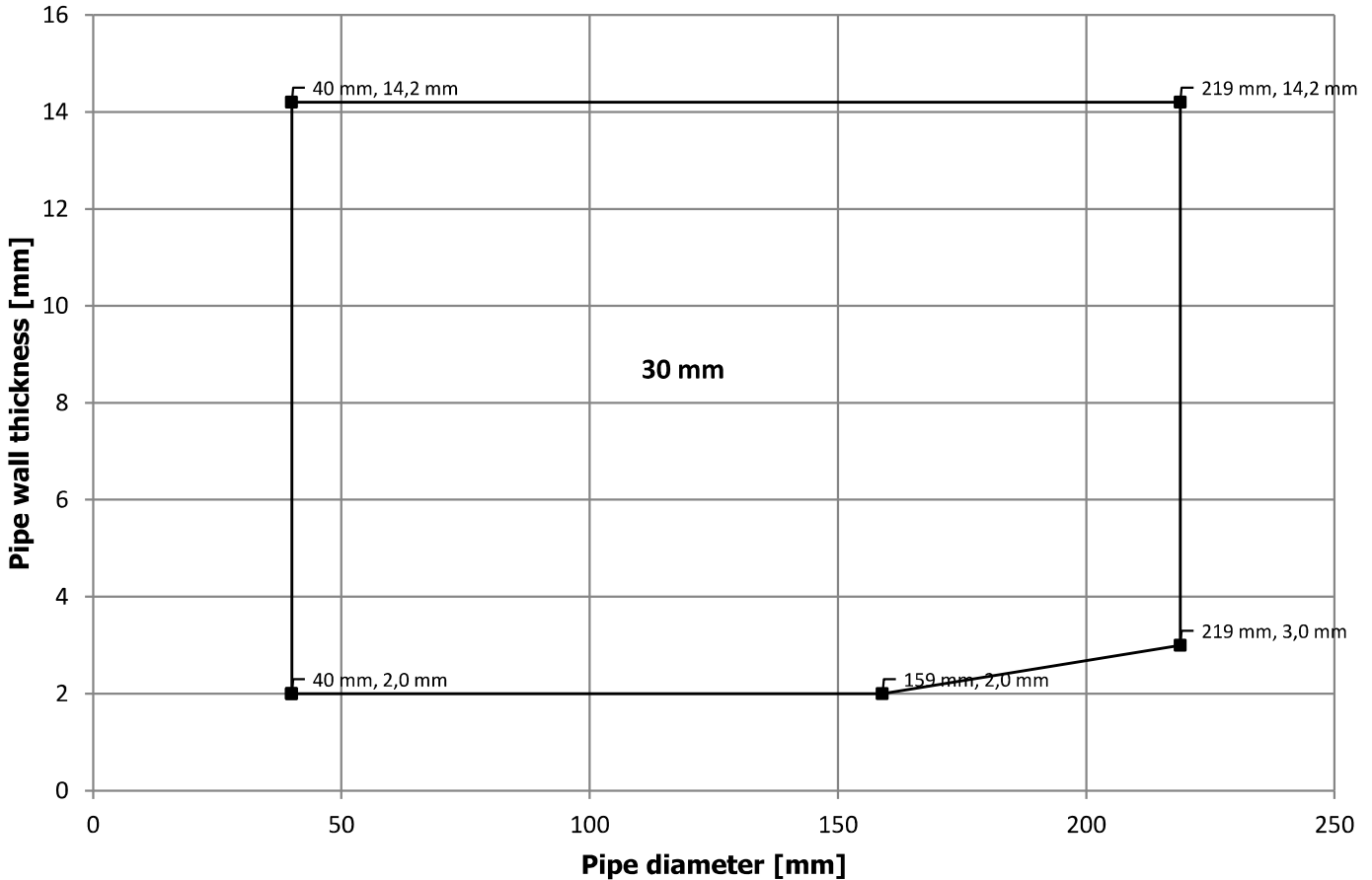
EI60 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Local/Continued, Sustained insulation
Stainless steel



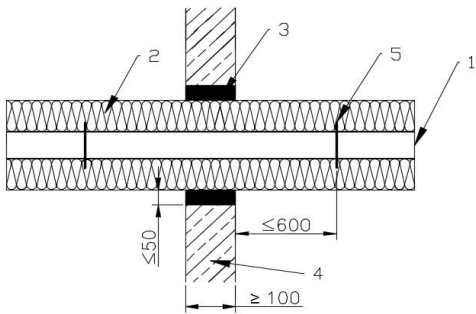
| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Wall | Flexible wall or Aerated concrete, Concrete or Masonry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

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

Field of application for insulation thickness

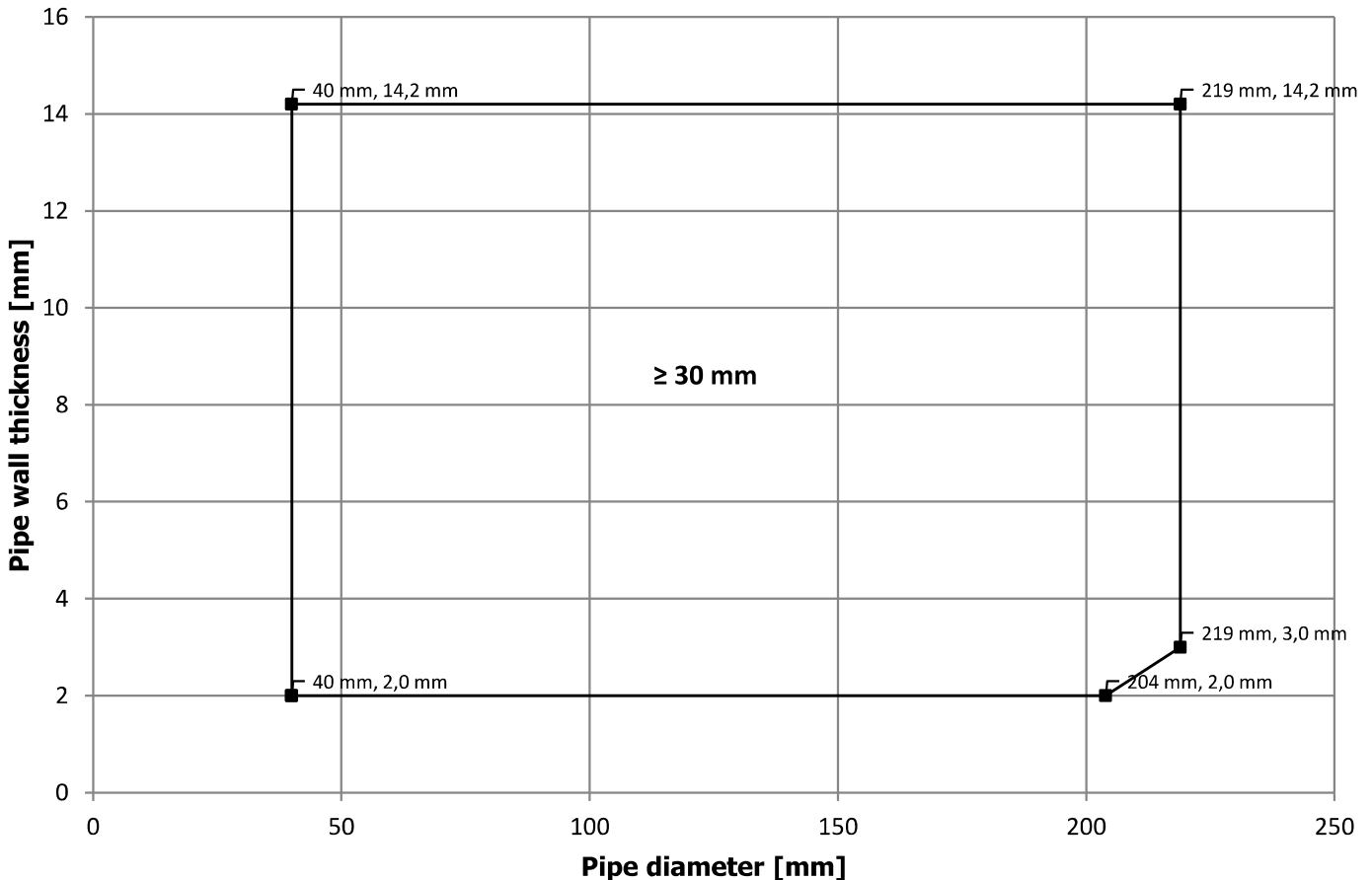


EI60 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Continued, Sustained insulation
Stainless steel

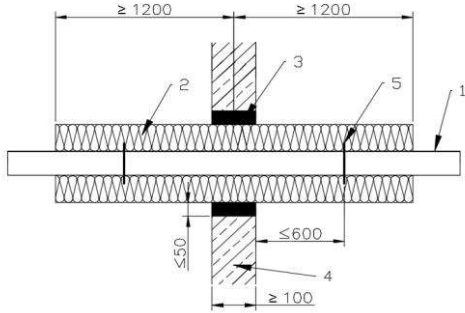


| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to c/c 250 mm |
| 3 | Residual gap | Filled with Mortar or Concrete |
| 4 | Wall | Flexible wall or Aerated concrete, Concrete or Masonry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

Field of application for insulation thickness



EI30 - Horizontal pipe direction
U Protect Roll 3.1 Alu1
Local/Continued, Sustained insulation
Stainless steel



| No. | Item | Description |
|-----|-----------------|--|
| 1 | Pipe | Stainless steel |
| 2 | Insulation | U Protect Roll 3.1 Alu1 fixed with steel wire less or equal to 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 thickness

