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European Technical Assessment

ETA-19/0038 of 28/06/2019

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	INTU FR MASTIC INTU FR COAT A INTU FR COAT I INTU FR BOARD A
Product family to which the construction product belongs	Fire Stopping and Fire Sealing Products. Penetration Seals
Manufacturer	INTUSEAL Sp. z o.o. ul. Kineskopowa 1 05-500 Piaseczno Poland
Manufacturing plants	Plant MPA1 Plant MPA2
This European Technical Assessment contains	52 pages including 2 Annexes which form an integral part of this Assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 350454-00-1104 "Fire Stopping and Fire Sealing Products. Penetration Seals"
This version replaces	ETA-19/0038 issued on 29/03/2019

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Specific Part

1 Technical description of the product

INTU FR MASTIC is a white, one component, acrylic, intumescent mastic. It is used as a filler (for adhesion or filling gaps) and supplied in 310 ml tubes and 600 ml foil packs.

INTU FR COAT A is a white, one component, ablative paint. It is used as a coating and supplied in buckets.

INTU FR COAT I is a dark grey, one component, intumescent paint. It is used as a coating and supplied in buckets.

INTU FR BOARD A is a pre-painted board, made of stone mineral wool board in accordance with EN 14303 or EN 13162, with density of at least 150 kg/m^3 and thickness of at least 60 mm, covered on external side (side which is exposed to fire) with INTU FR COAT A paint, with thickness ≥ 1,0 mm.

These products are used to form single or mixed penetration seals where metal pipes, single cables or cable bundles penetrate walls and floors.

Auxiliary product, used with INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I and INTU FR BOARD A to form penetration seals is stone mineral wool insulation, in accordance with EN 14303 or EN 13162, used as a pipe insulation (mineral wool mats with aluminium foil facing) or as a backing material (mineral wool boards or loose mineral wool).

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

2.1 Intended use

The intended use of INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I and INTU FR BOARD A is to reinstate the fire resistance performance of flexible wall, rigid wall or rigid floor constructions, where they are penetrated by metal pipes, single cables or cable bundles.

The specific elements of construction that of INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I and INTU FR BOARD A may be used to provide a penetration seal in, are as follows:

Rigid walls:	The wall must have a minimum thickness in accordance with Annex B and comprise concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick or checker brick, with a minimum density of 600 kg/m^3.
Flexible walls:	The wall must have a minimum thickness in accordance with Annex B and comprise timber or steel studs lined on both faces with minimum two layers (with overall board layer thickness on one side equal to or greater than 25 mm) of 'Type F' or 'Type DF' gypsum plasterboards according to EN 520. In timber stud walls, no part of the penetration shall be closer than 100 mm to a stud, the cavity must be closed between the penetration seal and the stud and minimum 100 mm of insulation of reaction to fire class A1 or A2, according to EN 13501-1, is provided within the cavity between the penetration seal and the stud.
Rigid floors:	The floor must have a minimum thickness in accordance with Annex B and comprise concrete or reinforced concrete, with a minimum density of 1700 kg/m^3.

The supporting construction shall be classified in accordance with EN 13501-2 for the required fire resistance period (equal to or greater than specified in Annex B).

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I and INTU FR BOARD A may be used to provide a penetration seal with specific metal pipes and cables (according to Annex A and Annex B).

Details of penetration seals are provided in Annex B. Additional provisions are provided in Annex A.

The performances given in this European Technical Assessment are based on an assumed working life of the product of 10 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2.2 Use category

Type Z_2: intended for use in internal conditions with humidity lower than 85% RH, excluding temperatures below 0°C, without exposure to rain or UV.

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

3.1 Performance of the product

3.1.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	No performance assessed
Resistance to fire	Annex B

3.1.2 Hygiene, health and the environment (BWR 3)

No performance assessed.

3.1.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Durability	Use category: Type Z_2

3.1.4 Protection against noise (BWR 5)

No performance assessed.

3.1.5 Energy economy and heat retention (BWR 6)

No performance assessed.

3.2 Methods used for the assessment

The assessment of the products has been made in accordance with the European Assessment Document EAD 350454-00-1104 "Fire Stopping and Fire Sealing Products. Penetration Seals".

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 99/454/EC of the European Commission, as amended by Decision 2001/596/EC of the European Commission the system 1 of assessment and verification of constancy of performance applies (see Annex V to Regulation (EU) No 305/2011).

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 28/06/2019 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

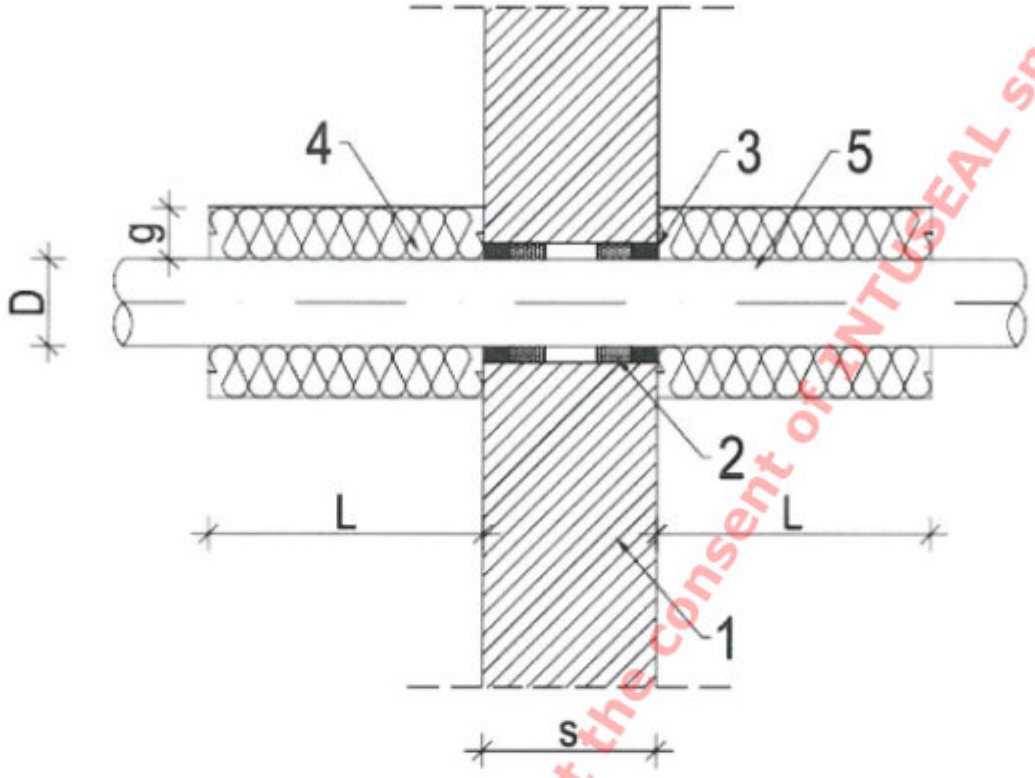
Additional provisions

- In case of classifications given in Annex B for penetration seals with INTU FR BOARD A product, it is possible to use mineral wool boards acc. to EN 14303 or EN 13162, with density of at least 150 kg/m^3 and thickness of at least 60 mm, painted on external side (side which is exposed to fire) with INTU FR COAT A, with thickness ≥ 1,0 mm, instead of the INTU FR BOARD A.
- Classifications given in Annex B for steel and copper pipes are also valid for other metal pipes with:
  - thermal conductivity lower than respectively steel or copper, and
  - melting point at least equal to respectively steel or copper, and greater than:
    - 739 °C for the fire resistance class EI 15,
    - 782 °C for the fire resistance class EI 20,
    - 843 °C for the fire resistance class EI 30,
    - 903 °C for the fire resistance class EI 45,
    - 946 °C for the fire resistance class EI 60,
    - 1006 °C for the fire resistance class EI 90,
    - 1049 °C for the fire resistance class EI 120,
    - 1110 °C for the fire resistance class EI 180,
    - 1153 °C for the fire resistance class EI 240.
- Classifications given in Annex B for insulated pipes are valid for pipes with sustained or interrupted, and local or continued insulation made of mineral wool with aluminium foil facing and does not cover non-insulated pipes. The length, thickness and density of the insulation may be increased but cannot be reduced.
- Classifications given in Annex B for cables or cable bundles are valid both when cable supports pass and when they don't pass through the seal. Classifications are not valid for lidded cable trays / trunkings, where the lid passes through the penetration seal.
- Classifications given in Annex B for cables covers all cable types currently and commonly used in building practice in EU, except tied bundles, waveguides and non-sheathed cables; optical fibre cables are covered.
- Classifications given in Annex B for non-sheathed cables covers all non-sheathed cables (wires) made of cables with diameter not greater than 24 mm.
- Classifications given in Annex B for cable bundles are valid for tied bundles with diameter not greater than 100 mm, made of cables with diameter not greater than 21 mm.
- The minimum distance between the single penetration seals (all penetration seals in this ETA, except mixed penetration seals described in Annex B29) in supporting construction shall be:
  - not restricted – in case of insulated metal pipes (distance between adjacent pipe insulations),
  - 100 mm – in case of non-insulated metal pipes (distance between adjacent pipes),
  - 100 mm – in case of cables and cable bundles.
- Maximum dimensions of mixed penetration seals described in Annex B29 are (width x length) 600 x 600 mm, provided the total amount of cross sections of the services (including insulation) does not exceed 60% of the penetration area and the minimum distance between services or between service and penetration seal edge is not smaller than:
  - 35 mm – in case of distance between cables or cable ladders / trays and side seal edge,
  - 71 mm – in case of distance between cables and upper seal edge,
  - 30 mm – in case of distance between cable ladders / trays,
  - 130 mm – in case of distance between cables and cable ladders / trays,
  - 60 mm – in case of distance between cables or cable ladders / trays and bottom seal edge.

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	Annex A
Additional provisions	of European Technical Assessment ETA-19/0038

- Pipes and cables shall be supported at maximum 400 mm away from both faces of the wall constructions and from the upper face of floor constructions.
- Services are placed in angle 90° to the supporting construction.

Steel pipe with local, interrupted mineral wool insulation penetration seal in rigid wall, made with use of INTU FR MASTIC



1 Rigid wall with thickness of S ≥ 150 mm and density ≥ 600 kg/m^3
2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below
3 INTU FR MASTIC mass, dimensions in accordance with table below
4 Mineral wool density ≥ 37 kg/m^3; length L and thickness g, in accordance with table below
5 Steel pipe with diameter of D and pipe wall thickness t

Pipe diameter [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Mineral wool insulation, length x thickness [mm]
D ≤ 42,4	15 x 10	15 x 10	250 x 30
D ≤ 108,0	15 x 10	15 x 10	250 x 50
D ≤ 159,0	20 x 25	15 x 25	650 x 50
D ≤ 219,0	20 x 25	15 x 25	650 x 50

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	Annex B1
Penetration seals made with use of INTU FR MASTIC Metal pipes penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B1.

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	15 x 10	15 x 10	EI 240 – C/U EI 240 – C/C

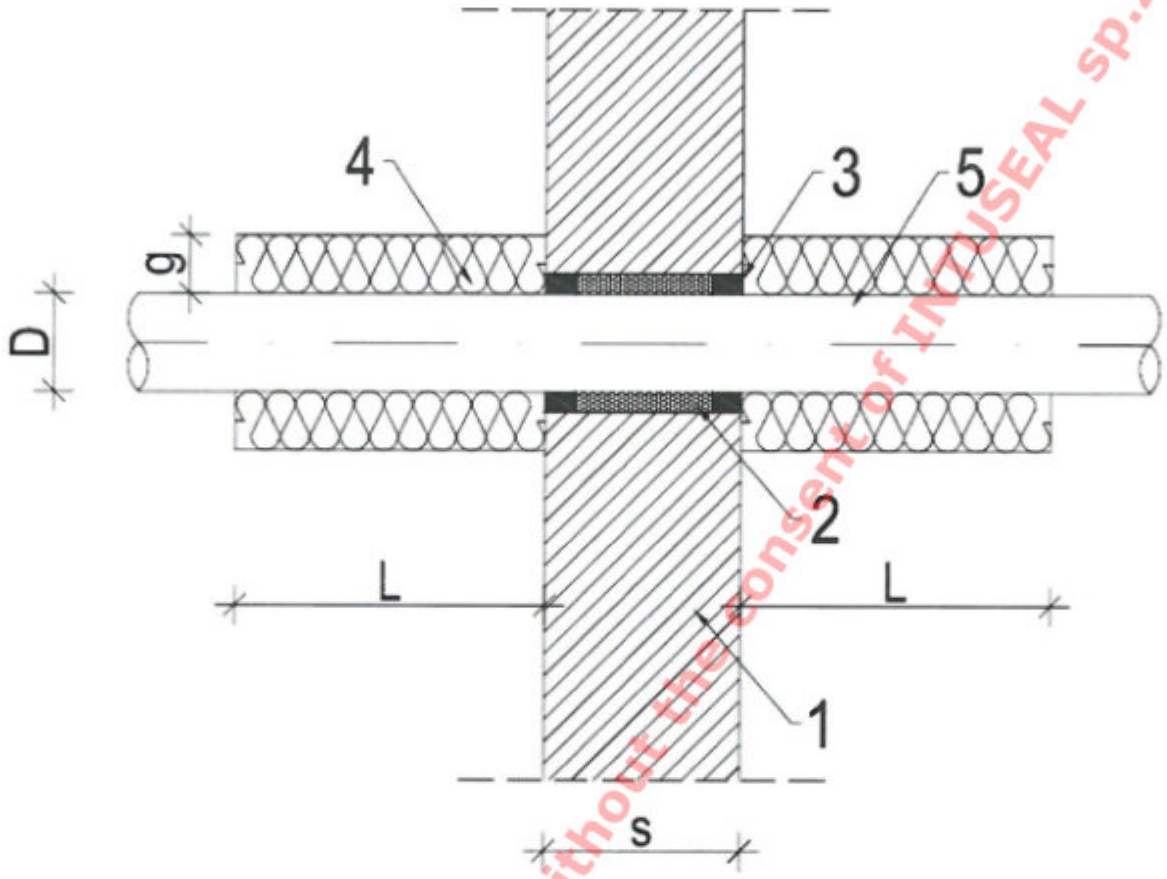
Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	15 x 10	15 x 10	EI 180 – C/U EI 180 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	15 x 10	15 x 10	EI 180 – C/U EI 180 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	15 x 10	15 x 10	EI 180 – C/U EI 180 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	15 x 10	15 x 10	EI 180 – C/U EI 180 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	15 x 10	15 x 10	EI 180 – C/U EI 180 – C/C

Steel pipes with local, interrupted mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	108,0 < D ≤ 139,7	4,0 – 14,2	20 x 25	15 x 25	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,0 – 14,2	20 x 25	15 x 25	EI 120 – C/U EI 120 – C/C
	159,0 < D ≤ 219,0	4,5 – 14,2	20 x 25	15 x 25	EI 90 – C/U EI 90 – C/C

Copper pipe with local, interrupted mineral wool insulation penetration seal in rigid wall, made with use of INTU FR MASTIC



1 Rigid wall with thickness of S ≥ 150 mm and density ≥ 600 kg/m^3

2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below

3 INTU FR MASTIC mass, dimensions in accordance with table below

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness g, in accordance with table below

5 Copper pipe with diameter of D and pipe wall thickness t

Pipe diameter [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Mineral wool insulation, length x thickness [mm]
D ≤ 6,0	20 x 25	all empty space	500 x 30
D ≤ 54,0	20 x 25	all empty space	500 x 30
D ≤ 88,9	20 x 25	all empty space	700 x 50

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B3**
Penetration seals made with use of INTU FR MASTIC Penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B3.

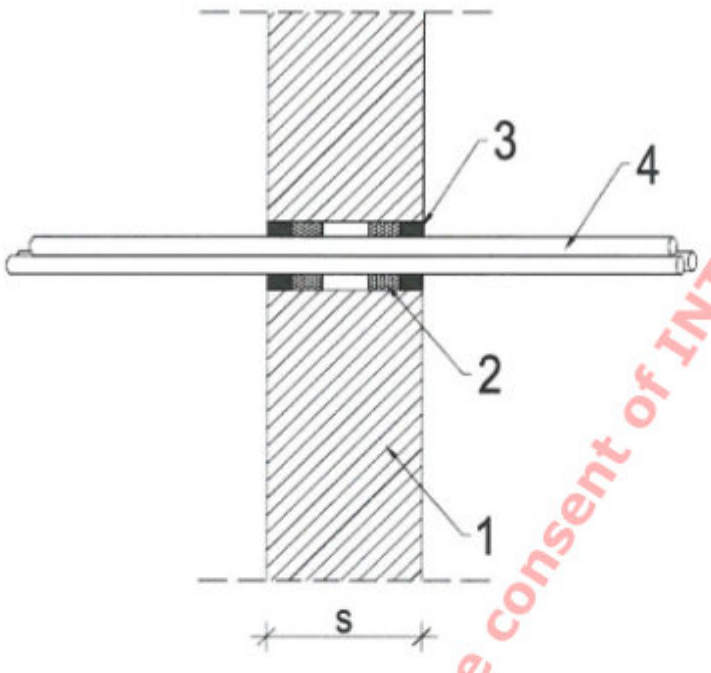
Copper pipes with local, interrupted mineral wool insulation, length of 500 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	20 x 25	all empty space	EI 240 – C/U EI 240 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C

Copper pipes with local, interrupted mineral wool insulation, length of 700 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Copper	54,0 < D ≤ 88,9	2,2 – 14,2	20 x 25	all empty space	EI 120 – C/U EI 120 – C/C

Cables penetration seal in rigid wall, made with use of INTU FR MASTIC



1 Rigid wall with thickness of S ≥ 150 mm and density ≥ 600 kg/m^3
2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below
3 INTU FR MASTIC mass, dimensions in accordance with table below
4 Single cable (ø ≤ 21 mm) / cables in bundle (ø of bundle ≤ 100 mm, made of cables ø ≤ 21 mm)

Type of cable	Cable / bundle diameter [mm]	INTU FR MASTIC, depth x width [mm]	Mineral wool (backing material), depth x width [mm]
Single cable	ø ≤ 21	20 x 25	15 x 25
Cables in bundle	ø of bundle ≤ 100, made of cables ø ≤ 21 mm	20 x 25	15 x 25

Resistance to fire classification of single cable or cable bundles penetration seals, made in accordance with Annex A and Annex B5.

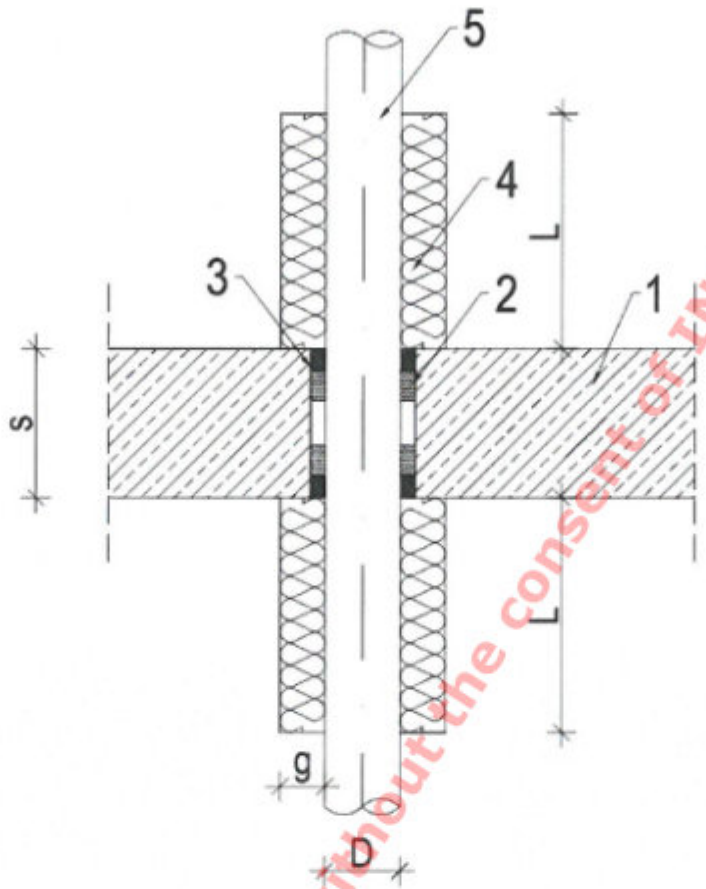
Small cables (ø ≤ 21 mm)

Fire resistance class: EI 240

Bundle of cables (ø of bundle ≤ 100 mm, made of cables ø ≤ 21 mm)

Fire resistance class: EI 90

Steel pipe with local, interrupted mineral wool insulation penetration seal in rigid floor, made with use of INTU FR MASTIC



1 Rigid floor with thickness of S ≥ 150 mm and density ≥ 1700 kg/m^3

2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below

3 INTU FR MASTIC mass, dimensions in accordance with table below

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness g, in accordance with table below

5 Steel pipe with diameter of D and pipe wall thickness t

Pipe diameter [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Mineral wool insulation, length x thickness [mm]
D ≤ 42,4	15 x 10	15 x 10	250 x 30
D ≤ 108,0	15 x 10	15 x 10	250 x 50
D ≤ 159,0	20 x 25	15 x 25	650 x 50

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B7**
Penetration seals made with use of INTU FR MASTIC Penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B7.

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	15 x 10	15 x 10	EI 240 – C/U EI 240 – C/C

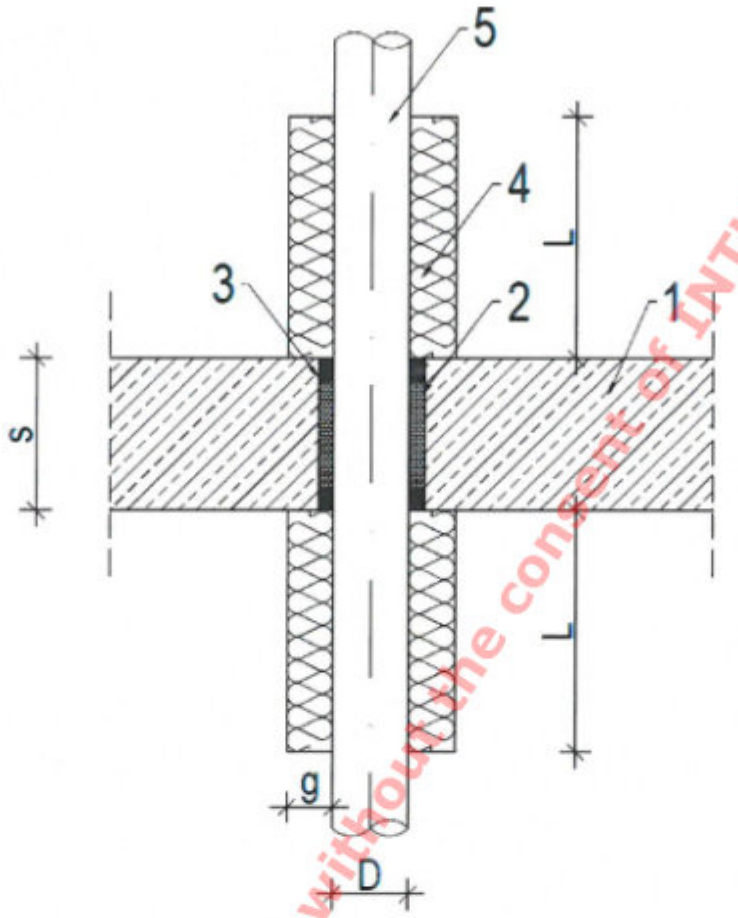
Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	15 x 10	15 x 10	EI 120 – C/U EI 120 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	15 x 10	15 x 10	EI 120 – C/U EI 120 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	15 x 10	15 x 10	EI 120 – C/U EI 120 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	15 x 10	15 x 10	EI 120 – C/U EI 120 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	15 x 10	15 x 10	EI 120 – C/U EI 120 – C/C

Steel pipes with local, interrupted mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Steel	108,0 < D ≤ 139,7	4,0 – 14,2	20 x 25	15 x 25	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,0 – 14,2	20 x 25	15 x 25	EI 120 – C/U EI 120 – C/C

Copper pipe with local, interrupted mineral wool insulation penetration seal in rigid floor, made with use of INTU FR MASTIC



1 Rigid floor with thickness of S ≥ 150 mm and density ≥ 1700 kg/m^3

2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below

3 INTU FR MASTIC mass, dimensions in accordance with table below

4 Mineral wool density ≥ 37 kg/m^3, length L and thickness g, in accordance with table below

5 Copper pipe with diameter of D and pipe wall thickness t

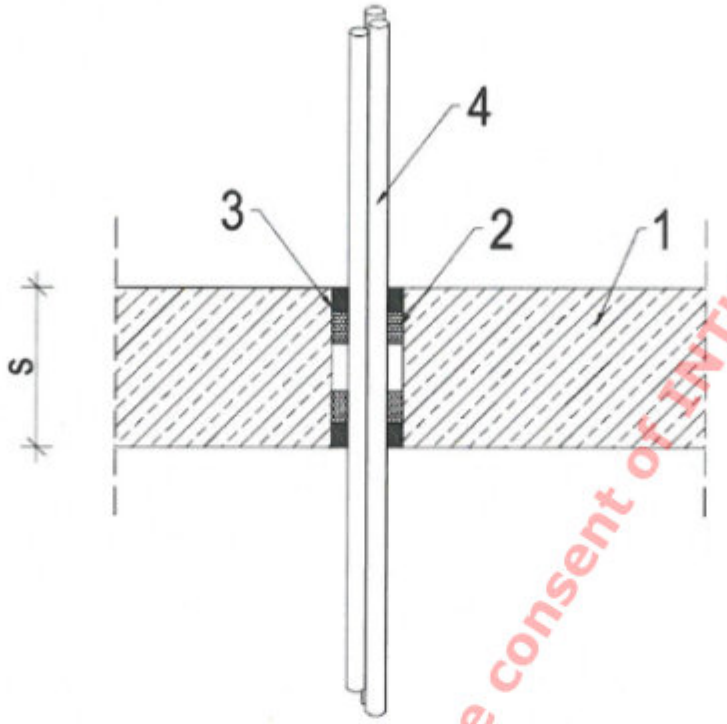
Pipe diameter [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Mineral wool insulation, length x thickness [mm]
D ≤ 6,0	20 x 25	all empty space	500 x 30
D ≤ 54,0	20 x 25	all empty space	500 x 30

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B9.

Copper pipes with local, interrupted mineral wool insulation, length of 500 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR MASTIC depth x width [mm]	Mineral wool (backing material), depth x width [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	20 x 25	all empty space	EI 180 – C/U EI 180 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	20 x 25	all empty space	EI 90 – C/U EI 90 – C/C

Cables penetration seal in rigid floor, made with use of INTU FR MASTIC



1 Rigid floor with thickness of S ≥ 150 mm and density ≥ 1700 kg/m^3
2 Mineral wool with density ≥ 40 kg/m^3, dimensions in accordance with table below
3 INTU FR MASTIC mass, dimensions in accordance with table below
4 Single cable (ø ≤ 21 mm) / cables in bundle (ø of bundle ≤ 100 mm, made of cables ø ≤ 21 mm)

Type of cable	Cable / bundle diameter [mm]	INTU FR MASTIC, depth x width [mm]	Mineral wool (backing material), depth x width [mm]
Single cable	ø ≤ 21	20 x 25	15 x 25
Cables in bundle	ø of bundle ≤ 100, made of cables ø ≤ 21 mm	20 x 25	15 x 25

Resistance to fire classification of single cable or cable bundles penetration seals, made in accordance with Annex A and Annex B11.

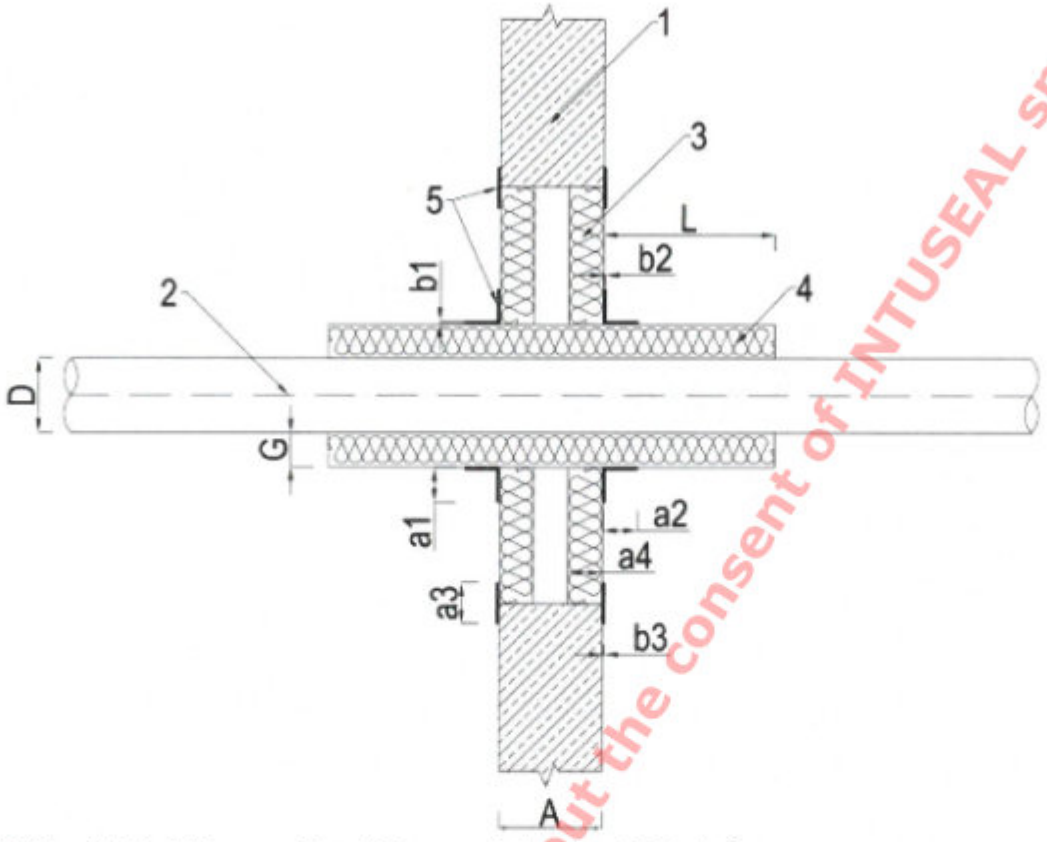
Small cables (ø ≤ 21 mm)

Fire resistance class: EI 120

Bundle of cables (ø of bundle ≤ 100 mm, made of cables ø ≤ 21 mm)

Fire resistance class: EI 120

Metal pipe with local, sustained mineral wool insulation penetration seal in rigid wall, made with use of INTU FR COAT A and INTU FR BOARD A



1 Rigid wall with thickness of A ≥ 150 mm and density ≥ 600 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 INTU FR BOARD A; thickness a4 ≥ 60 mm

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness G, in accordance with table below

5 INTU FR COAT A ablative paint; dimensions:
a1 ≥ 50 mm, a2 ≥ 50 mm, a3 ≥ 20 mm,
b1 ≥ 0,6 mm, b2 ≥ 0,6 mm, b3 ≥ 0,6 mm

Pipe material	Pipe diameter [mm]	Mineral wool insulation thickness, G [mm]	Mineral wool insulation length, L [mm]
Steel	D ≤ 42,4	30	250
Steel	D ≤ 108,0	50	250
Steel	D ≤ 159,0	50	650
Steel	D ≤ 219,0	50	650
Copper	D ≤ 6,0	30	500
Copper	D ≤ 88,9	50	700

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	Annex B13
Penetration seals made with use of INTU FR COAT A and INTU FR BOARD A Penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B13.

Steel pipes with local, sustained mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	D ≤ 42,4	2,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Steel pipes with local, sustained mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Steel pipes with local, sustained mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	108,0 < D ≤ 139,7	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	159,0 < D ≤ 219,0	4,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Copper pipes with local, sustained mineral wool insulation, length of 500 mm, width of 30 mm

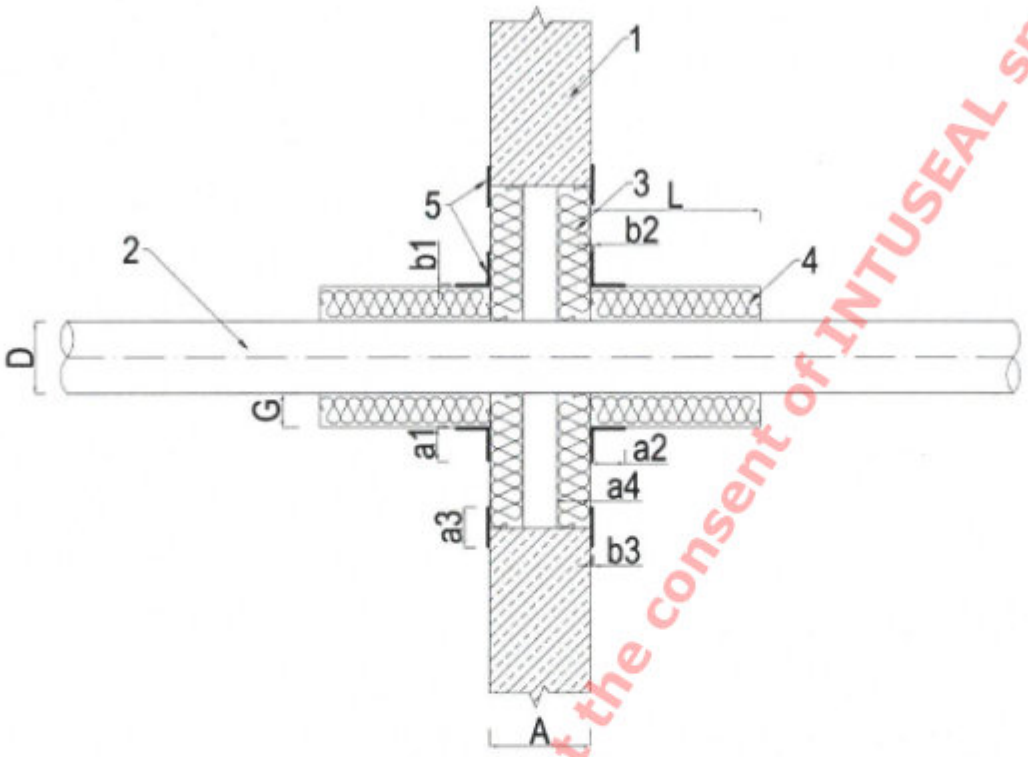
Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	D ≤ 6,0	≥ 0,8	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B13.

Copper pipes with local, sustained mineral wool insulation, length of 700 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	6,0 < D ≤ 15,0	≥ 1,0	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	15,0 < D ≤ 18,0	≥ 1,0	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	22,0 < D ≤ 35,0	1,3 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	54,0 < D ≤ 88,9	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C

Metal pipe with local, interrupted mineral wool insulation penetration seal in rigid wall, made with use of INTU FR COAT A and INTU FR BOARD A



1 Rigid wall with thickness of A ≥ 150 mm and density ≥ 600 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 INTU FR BOARD A; thickness a4 ≥ 60 mm

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness G, in accordance with table below

5 INTU FR COAT A ablative paint; dimensions:
a1 ≥ 50 mm, a2 ≥ 50 mm, a3 ≥ 20 mm,
b1 ≥ 0,6 mm, b2 ≥ 0,6 mm, b3 ≥ 0,6 mm

Pipe material	Pipe diameter [mm]	Mineral wool insulation thickness, G [mm]	Mineral wool insulation length, L [mm]
Steel	D ≤ 42,4	30	250
Steel	D ≤ 108,0	50	250
Steel	D ≤ 159,0	50	650
Steel	D ≤ 219,0	50	650
Copper	D ≤ 6,0	30	500

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B15**
Penetration seals made with use of INTU FR COAT A and INTU FR BOARD A Penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B15.

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	D ≤ 42,4	2,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

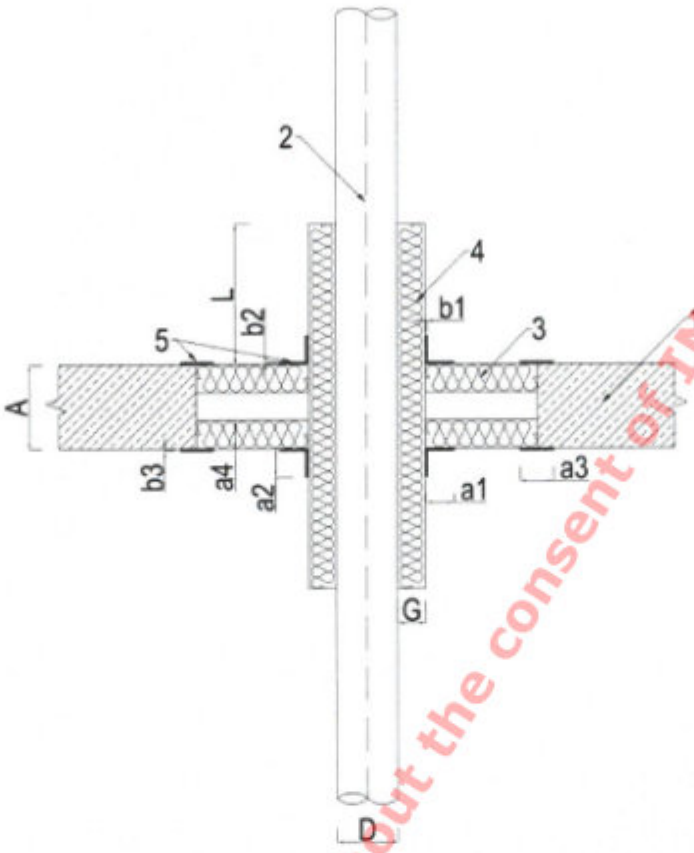
Steel pipes with local, interrupted mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	108,0 < D ≤ 139,7	4,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,3 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	159,0 < D ≤ 219,0	4,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Copper pipes with local, interrupted mineral wool insulation, length of 500 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	D ≤ 6,0	≥ 0,8	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Metal pipe with local, sustained mineral wool insulation penetration seal in rigid floor, made with use of INTU FR COAT A and INTU FR BOARD A



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 INTU FR BOARD A; thickness a4 ≥ 60 mm

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness G, in accordance with table below

5 INTU FR COAT A ablative paint; dimensions:
a1 ≥ 50 mm, a2 ≥ 50 mm, a3 ≥ 20 mm,
b1 ≥ 0,6 mm, b2 ≥ 0,6 mm, b3 ≥ 0,6 mm

Pipe material	Pipe diameter [mm]	Mineral wool insulation thickness, G [mm]	Mineral wool insulation length, L [mm]
Steel	D ≤ 42,4	30	250
Steel	D ≤ 108,0	50	250
Steel	D ≤ 159,0	50	650
Copper	D ≤ 6,0	30	500
Copper	D ≤ 54,0	30	500
Copper	D ≤ 88,9	50	700

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	Annex B17
Penetration seals made with use of INTU FR COAT A and INTU FR BOARD A Penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B17.

Steel pipes with local, sustained mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	D ≤ 42,4	2,0 – 14,2	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C

Steel pipes with local, sustained mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Steel pipes with local, sustained mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	108,0 < D ≤ 139,7	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B17.

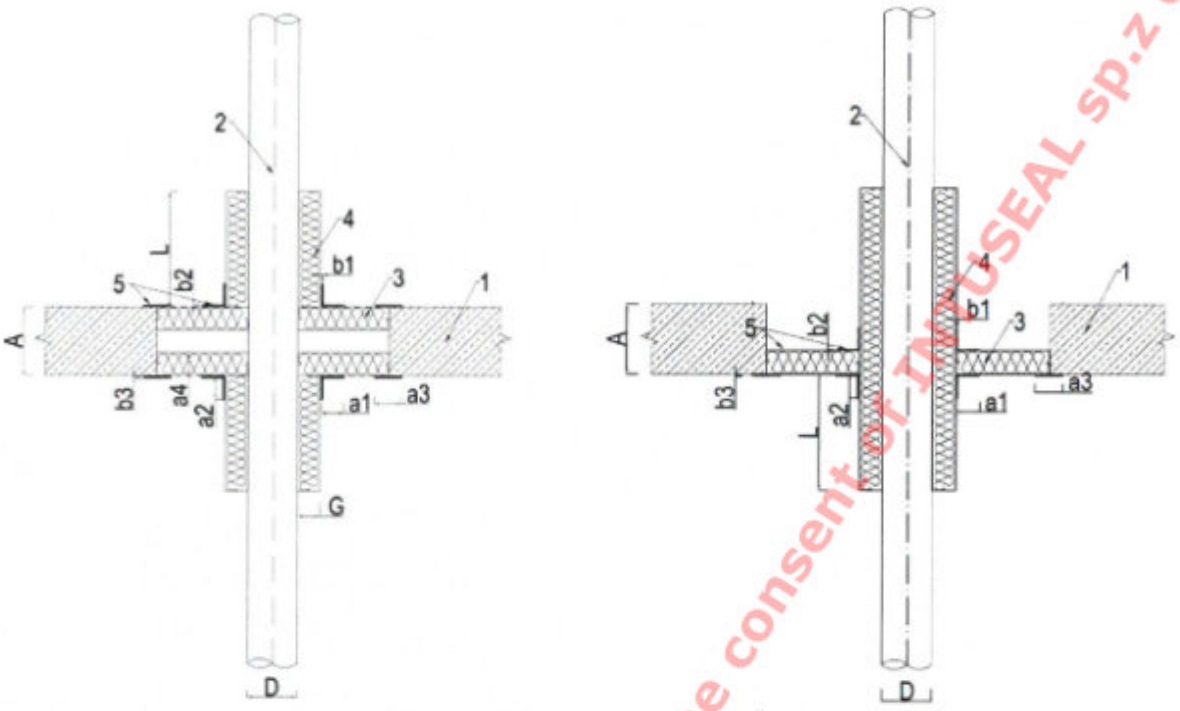
Copper pipes with local, sustained mineral wool insulation, length of 500 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	D ≤ 6,0	≥ 0,8	50 x 0,6	50 x 0,6	EI 240 – C/U EI 240 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	50 x 0,6	50 x 0,6	EI 180 – C/U EI 180 – C/C

Copper pipes with local, sustained mineral wool insulation, length of 700 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	54,0 < D ≤ 88,9	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 90 – C/U EI 90 – C/C

Metal pipe with local, interrupted mineral wool insulation penetration seal in rigid floor, made with use of INTU FR COAT A and INTU FR BOARD A



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 INTU FR BOARD A; thickness a4 ≥ 60 mm

4 Mineral wool density ≥ 37 kg/m^3; length L and thickness G, in accordance with table below

5 INTU FR COAT A ablative paint; dimensions:
a1 ≥ 50 mm, a2 ≥ 50 mm, a3 ≥ 20 mm,
b1 ≥ 0,6 mm, b2 ≥ 0,6 mm, b3 ≥ 0,6 mm

Pipe material	Pipe diameter [mm]	Mineral wool insulation thickness, G [mm]	Mineral wool insulation length, L [mm]
Steel	D ≤ 42,4	30	250
Steel	D ≤ 108,0	50	250
Steel	D ≤ 159,0	50	650
Steel	D ≤ 219,0	50	650
Copper	D ≤ 6,0	30	500
Copper	D ≤ 54,0	30	500
Copper	D ≤ 88,9	50	700

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B19.

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	D ≤ 42,4	2,0 – 14,2	50 x 0,6	50 x 0,6	EI 240 – C/U *) EI 240 – C/C *) EI 90 – C/U **) EI 90 – C/C **)

*) penetration sealed using two mineral wool boards installed on both sides of the floor
**) penetration sealed using one mineral wool board installed on the bottom of the floor

Steel pipes with local, interrupted mineral wool insulation, length of 250 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	42,4 < D ≤ 48,3	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U *) EI 120 – C/C *) EI 60 – C/U **) EI 60 – C/C **)
	48,3 < D ≤ 60,3	2,6 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U *) EI 120 – C/C *) EI 60 – C/U **) EI 60 – C/C **)
	60,3 < D ≤ 76,1	3,1 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U *) EI 120 – C/C *) EI 60 – C/U **) EI 60 – C/C **)
	76,1 < D ≤ 88,9	3,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U *) EI 120 – C/C *) EI 60 – C/U **) EI 60 – C/C **)
	88,9 < D ≤ 108,0	4,0 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U *) EI 120 – C/C *) EI 60 – C/U **) EI 60 – C/C **)

*) penetration sealed using two mineral wool boards installed on both sides of the floor
**) penetration sealed using one mineral wool board installed on the bottom of the floor

Steel pipes with local, interrupted mineral wool insulation, length of 650 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Steel	108,0 < D ≤ 139,7	4,2 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	139,7 < D ≤ 159,0	4,3 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C
	159,0 < D ≤ 219,0	4,5 – 14,2	50 x 0,6	50 x 0,6	EI 120 – C/U EI 120 – C/C

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B20**
Penetration seals made with use of INTU FR COAT A and INTU FR BOARD A Penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B19.

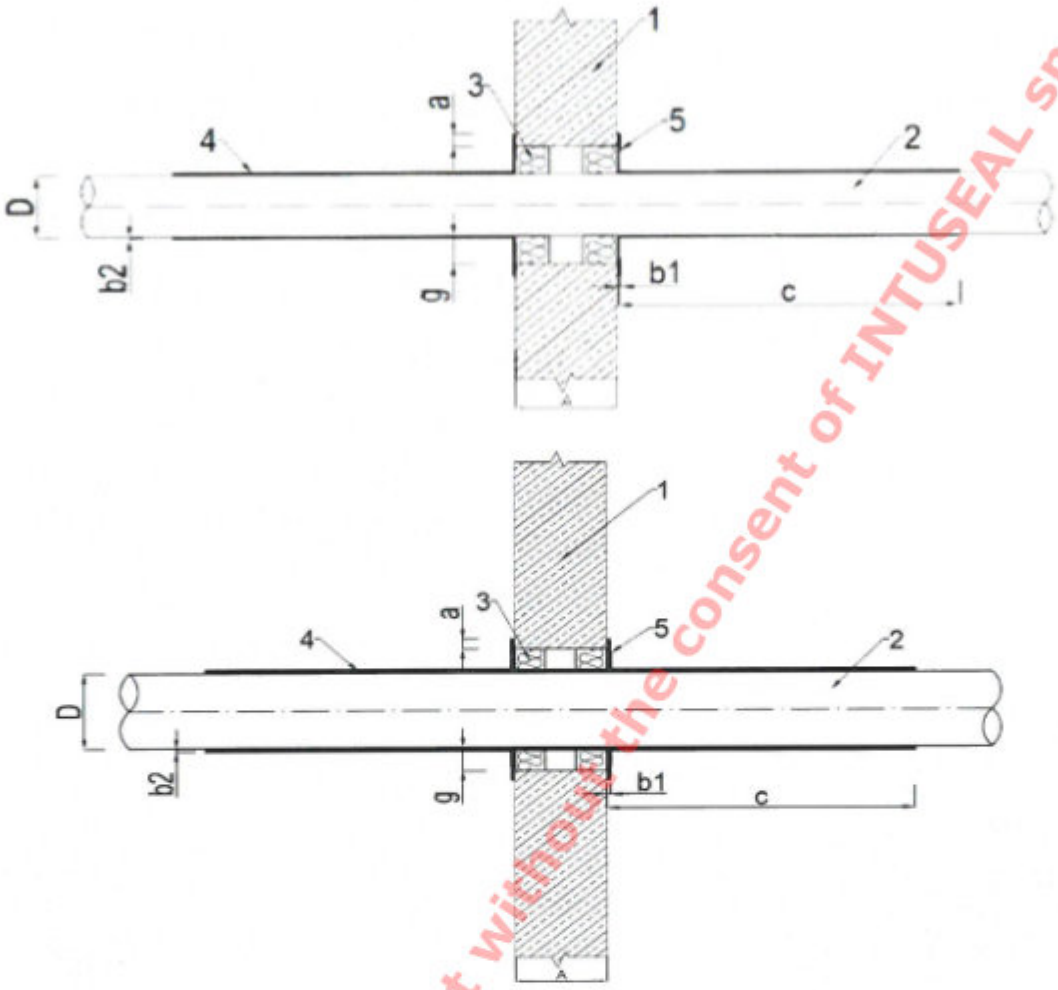
Copper pipes with local, interrupted mineral wool insulation, length of 500 mm, width of 30 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	D ≤ 6,0	≥ 0,8	50 x 0,6	50 x 0,6	EI 240 – C/U EI 240 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	50 x 0,6	50 x 0,6	EI 60 – C/U EI 60 – C/C

Copper pipes with local, interrupted mineral wool insulation, length of 700 mm, width of 50 mm

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT A, length x thickness [mm]		Fire resistance class
			on pipe insulation	on supporting construction	
Copper	54,0 < D ≤ 88,9	2,2 – 14,2	50 x 0,6	50 x 0,6	EI 90 – C/U EI 90 – C/C

Metal pipe without insulation penetration seal in rigid wall, made with use of INTU FR COAT A and INTU FR COAT I



1 Rigid wall thickness of A ≥ 150 mm and density ≥ 600 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 Mineral wool board density ≥ 150 kg/m^3, thickness ≥ 60 mm, width g ≤ 50 mm or INTU FR BOARD A

4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below

5 INTU FR COAT A ablative paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm; paint cannot contact directly with metal pipe

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500
Steel	D ≤ 159,0	2	500

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B21**
Penetration seals made with use of INTU FR COAT A and INTU FR COAT I Metal pipes penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

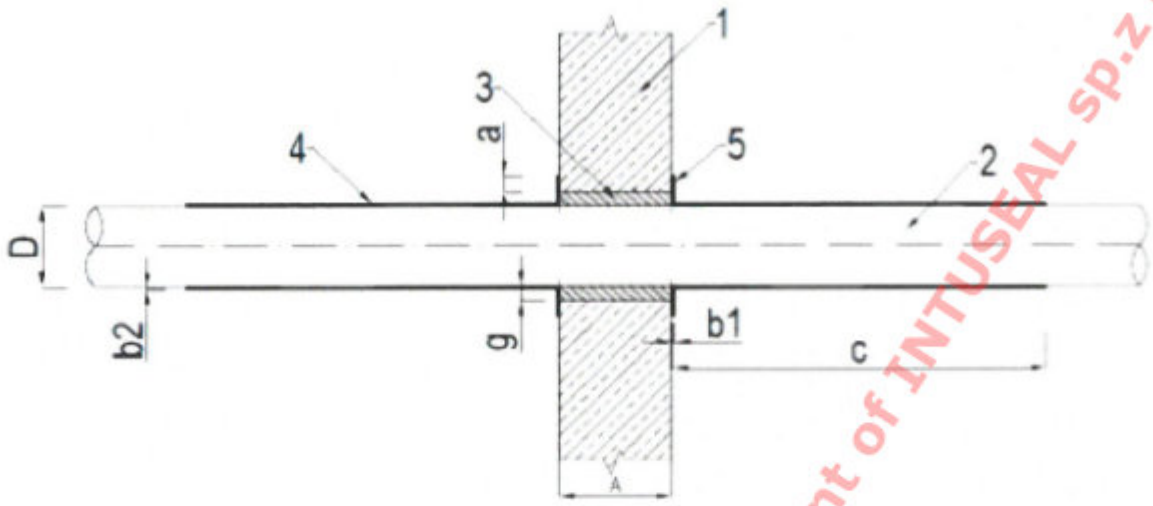
Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B21.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	EI 180 – C/U EI 180 – C/C
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	108,0 < D ≤ 139,7	4,0 – 14,2	500 x 2	EI 60 – C/U *) EI 60 – C/C *)
	139,7 < D ≤ 159,0	4,0 – 14,2	500 x 2	EI 60 – C/U *) EI 60 – C/C *)

*) pipe painted inside the wall

Metal pipe without insulation penetration seal in rigid wall, made with use of INTU FR COAT I



1 Rigid wall thickness of A ≥ 150 mm and density ≥ 600 kg/m^3
2 Metal pipe with diameter of D and pipe wall thickness t
3 Cement mortar, thickness g ≤ 20 mm
4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below
5 INTU FR COAT I intumescent paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm

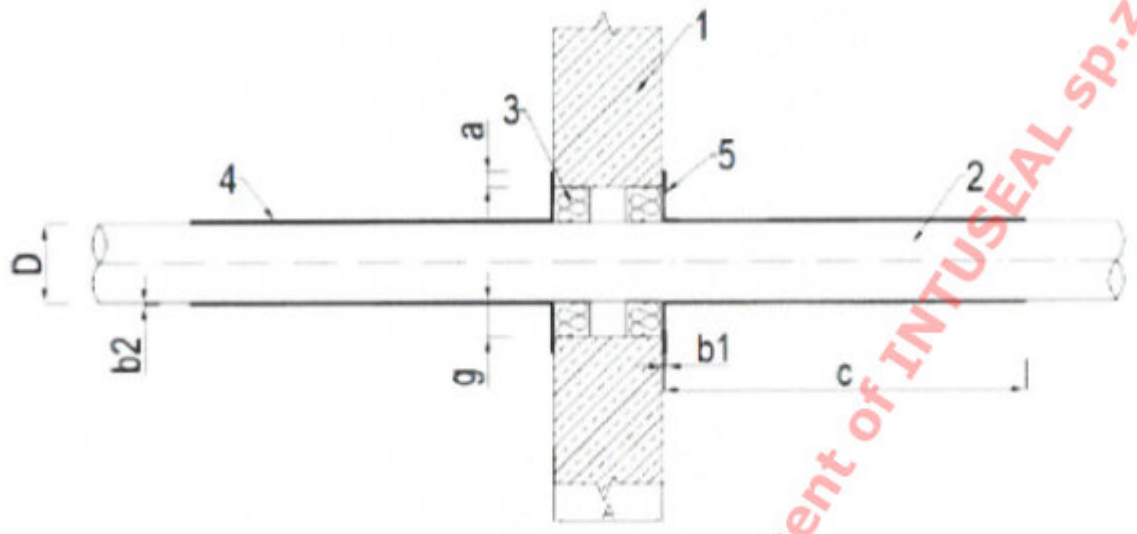
Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500
Steel	D ≤ 159,0	2	500
Steel	D ≤ 219,0	2	500

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B23.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	108,0 < D ≤ 139,7	4,0 – 14,2	500 x 2	EI 60 – C/U EI 60 – C/C
	139,7 < D ≤ 159,0	4,0 – 14,2	500 x 2	EI 60 – C/U EI 60 – C/C
	159,0 < D ≤ 219,0	4,5 – 14,2	500 x 2	EI 60 – C/U EI 60 – C/C

Metal pipe without insulation penetration seal in rigid wall, made with use of INTU FR COAT A and INTU FR COAT I



1 Rigid wall thickness of A ≥ 150 mm and density ≥ 600 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 Mineral wool board density ≥ 150 kg/m^3, thickness ≥ 60 mm, width g ≤ 50 mm or INTU FR BOARD A

4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below

5 INTU FR COAT A ablative paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm; paint cannot contact directly with metal pipe

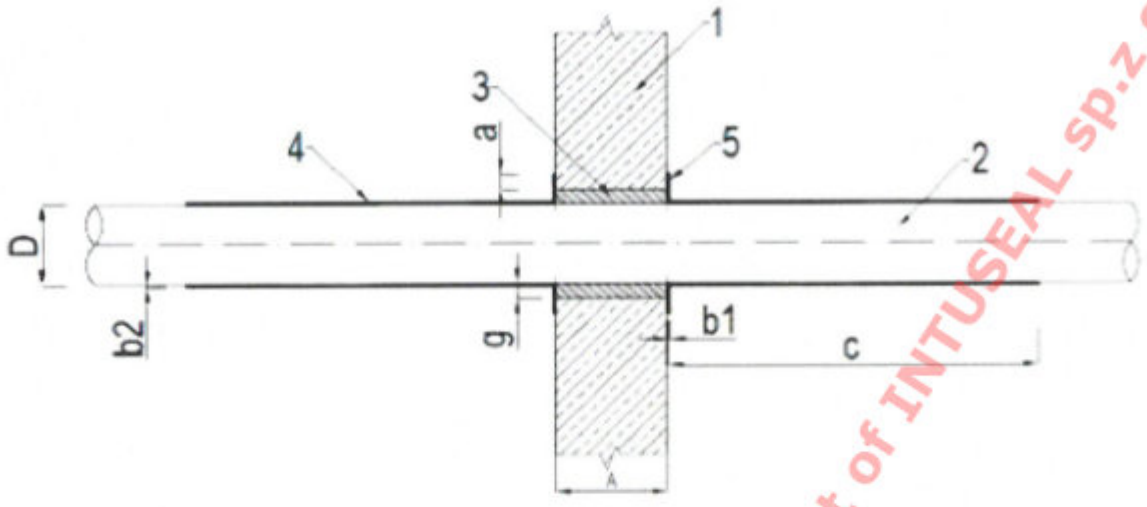
Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Copper	D ≤ 6,0	1	500
Copper	D ≤ 54,0	1	500

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B25.

Copper pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	500 x 1	EI 120 – C/U EI 120 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	500 x 1	EI 90 – C/U EI 90 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	500 x 1	EI 90 – C/U EI 90 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	500 x 1	EI 90 – C/U EI 90 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	500 x 1	EI 90 – C/U EI 90 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	500 x 1	EI 90 – C/U EI 90 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	500 x 1	EI 90 – C/U EI 90 – C/C

Metal pipe without insulation penetration seal in rigid wall, made with use of INTU FR COAT I



1 Rigid wall thickness of A ≥ 150 mm and density ≥ 600 kg/m^3
2 Metal pipe with diameter of D and pipe wall thickness t
3 Cement mortar, thickness g ≤ 20 mm
4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below
5 INTU FR COAT I intumescent paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm

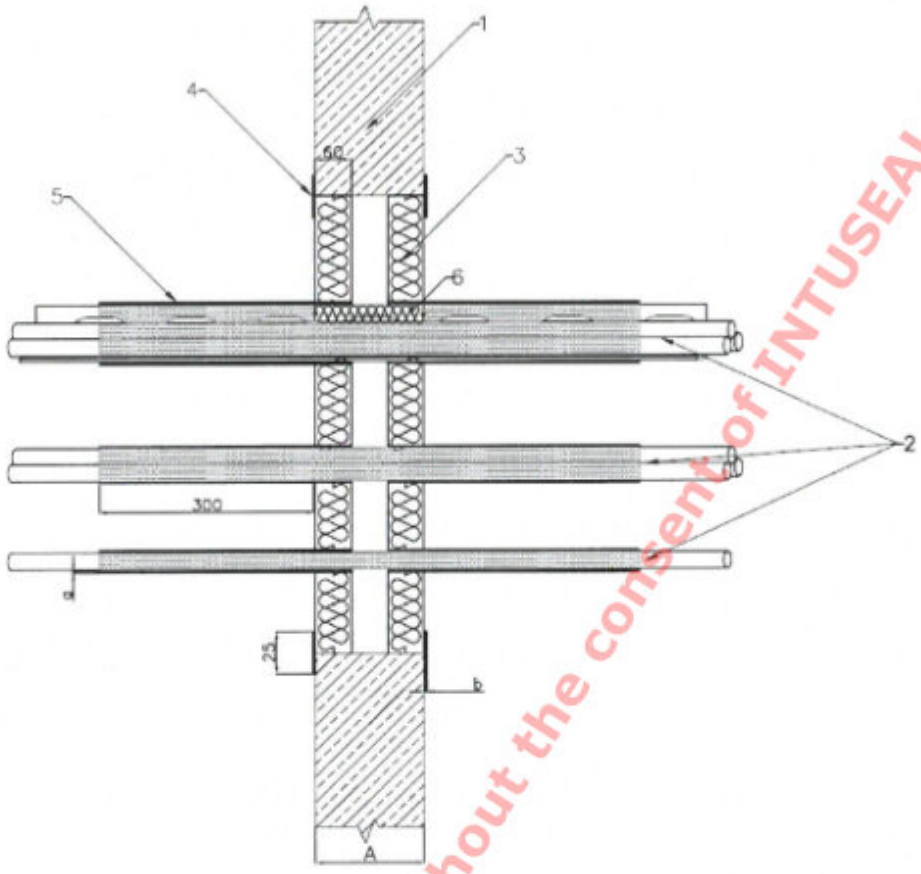
Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Copper	D ≤ 6,0	1	500
Copper	D ≤ 54,0	1	500

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B27.

Copper pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	6,0 < D ≤ 15,0	≥ 1,0	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	15,0 < D ≤ 18,0	≥ 1,1	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	18,0 < D ≤ 22,0	≥ 1,1	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	22,0 < D ≤ 35,0	1,4 – 14,2	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	35,0 < D ≤ 42,0	1,5 – 14,2	500 x 1	**EI 120 – C/U** **EI 120 – C/C**
	42,0 < D ≤ 54,0	1,7 – 14,2	500 x 1	**EI 120 – C/U** **EI 120 – C/C**

Cables penetration seal in rigid wall, made with use of INTU FR COAT I and INTU FR BOARD A (mixed penetration seal)



1 Rigid wall with thickness of A ≥ 150 mm and density ≥ 600 kg/m^3

2 Single cable / cables in bundle / cables in cable tray or ladder

3 INTU FR BOARD A

4 INTU FR COAT A ablative paint; thickness b ≥ 0,6 mm

5 INTU FR COAT I intumescent paint; length ≥ 300 mm, thickness a ≥ 1,0 mm

6 Empty space filled with loose mineral wool with density ≥ 40 kg/m^3 and INTU FR MASTIC mass

Type of cable	Cable / bundle diameter [mm]
Single cable	ø ≤ 21
Medium cable	ø ≤ 50
Large cable	ø ≤ 80
Cables in bundle	ø of bundle ≤ 100, made of cables ø ≤ 21 mm
Non-sheathed cable	wires, ø ≤ 24

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B29**
Penetration seals made with use of INTU FR COAT I, INTU FR COAT A, INTU FR MASTIC and INTU FR BOARD A Penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of cables and / or cable bundles in mixed penetration seals, made in accordance with Annex A and Annex B29.

Small cables (ø ≤ 21 mm)

Fire resistance class: EI 120

Medium cables (ø ≤ 50 mm)

Fire resistance class: EI 120

Large cables (ø ≤ 80 mm)

Fire resistance class: EI 120

Bundle of cables (ø of bundle ≤ 100 mm, made of cables ø ≤ 21 mm)

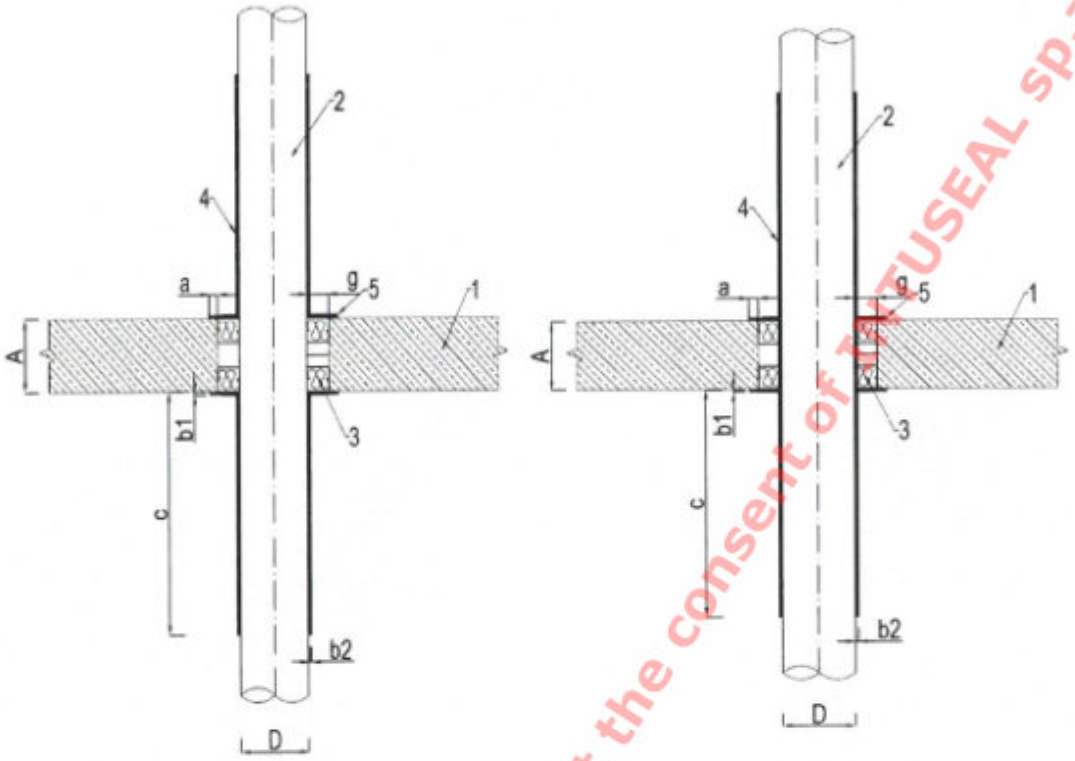
Fire resistance class: EI 120

Non-sheathed cables (wires, ø ≤ 24 mm)

Fire resistance class: EI 120

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B30**
Penetration seals made with use of INTU FR COAT I, INTU FR COAT A, INTU FR MASTIC and INTU FR BOARD A Penetration seals in rigid wall	of European Technical Assessment ETA-19/0038

Metal pipe without insulation penetration seal in rigid floor, made with use of INTU FR COAT A and INTU FR COAT I



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 Mineral wool board density ≥ 150 kg/m^3, thickness ≥ 60 mm, width g ≤ 50 mm or INTU FR BOARD A

4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below

5 INTU FR COAT A ablative paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm; paint cannot contact directly with metal pipe

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500
Steel	D ≤ 159,0	2	500
Steel	D ≤ 219,0	2	500

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B31**
Penetration seals made with use of INTU FR COAT A and INTU FR COAT I Metal pipes penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

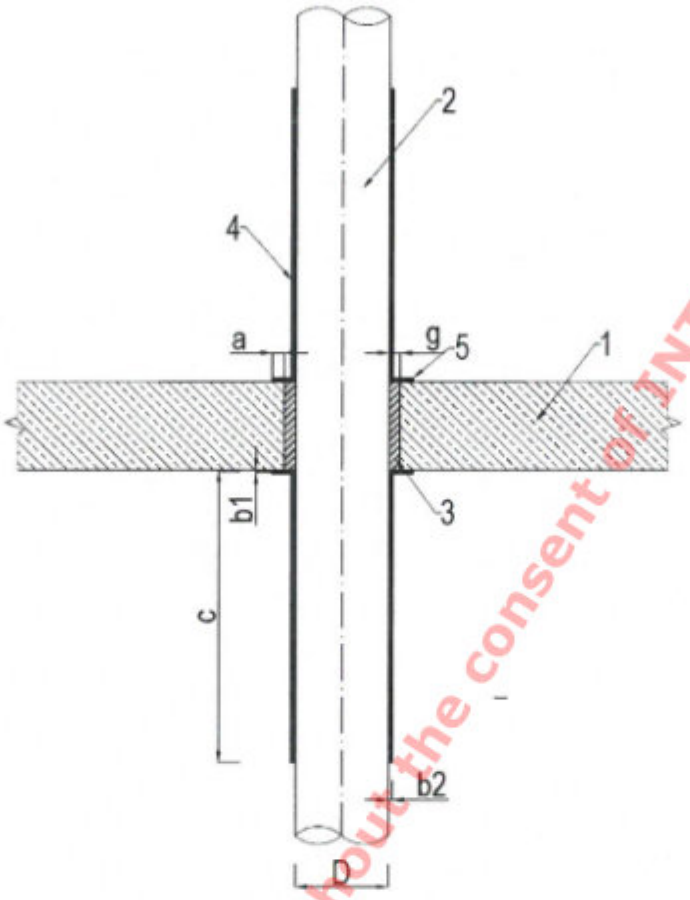
Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B31.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	108,0 < D ≤ 139,7	4,0 – 14,2	500 x 2	EI 180 – C/U *) EI 180 – C/C *)
	139,7 < D ≤ 159,0	4,0 – 14,2	500 x 2	EI 180 – C/U *) EI 180 – C/C *)
	159,0 < D ≤ 219,0	4,5 – 14,2	500 x 2	EI 90 – C/U *) EI 90 – C/C *)

*) pipe painted inside the floor

Metal pipe without insulation penetration seal in rigid floor, made with use of INTU FR COAT I



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3
2 Metal pipe with diameter of D and pipe wall thickness t
3 Cement mortar, thickness g ≤ 20 mm
4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below
5 INTU FR COAT I intumescent paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500
Steel	D ≤ 159,0	2	500
Steel	D ≤ 219,0	2	500

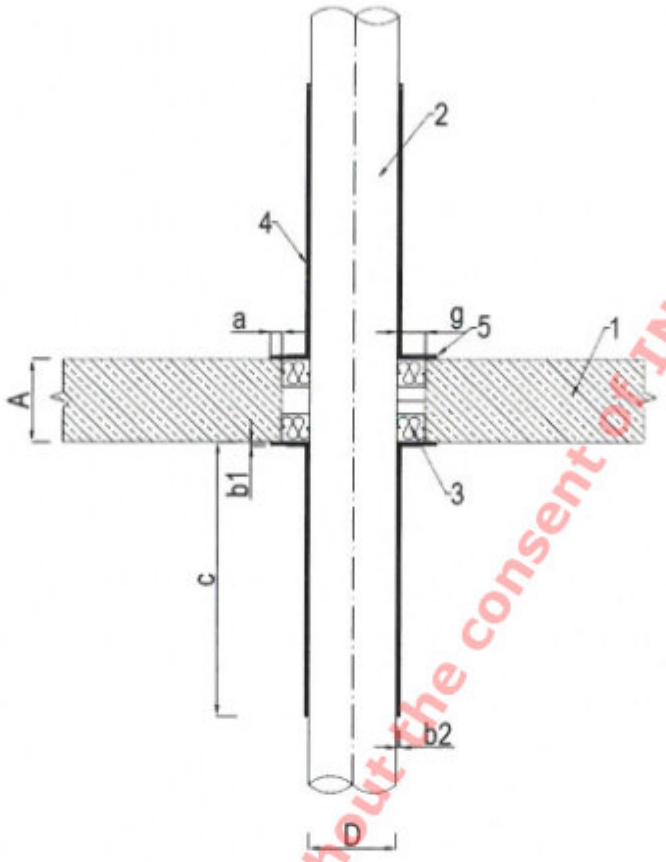
INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B33**
Penetration seals made with use of INTU FR COAT I Metal pipes penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B33.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	**EI 240 – C/U** **EI 240 – C/C**
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	**EI 180 – C/U** **EI 180 – C/C**
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	**EI 180 – C/U** **EI 180 – C/C**
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	**EI 180 – C/U** **EI 180 – C/C**
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	**EI 180 – C/U** **EI 180 – C/C**
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	**EI 180 – C/U** **EI 180 – C/C**
	108,0 < D ≤ 139,7	4,0 – 14,2	500 x 2	**EI 120 – C/U** **EI 120 – C/C**
	139,7 < D ≤ 159,0	4,0 – 14,2	500 x 2	**EI 120 – C/U** **EI 120 – C/C**
	159,0 < D ≤ 219,0	4,5 – 14,2	500 x 2	**EI 90 – C/U** **EI 90 – C/C**

Metal pipe without insulation penetration seal in rigid floor, made with use of INTU FR COAT A and INTU FR COAT I



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3

2 Metal pipe with diameter of D and pipe wall thickness t

3 Mineral wool board density ≥ 150 kg/m^3, thickness ≥ 60 mm, width g ≤ 50 mm or INTU FR BOARD A

4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below

5 INTU FR COAT A ablative paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm; paint cannot contact directly with metal pipe

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Copper	D ≤ 6,0	1	500
Copper	D ≤ 54,0	1	500
Copper	D ≤ 88,9	1	500

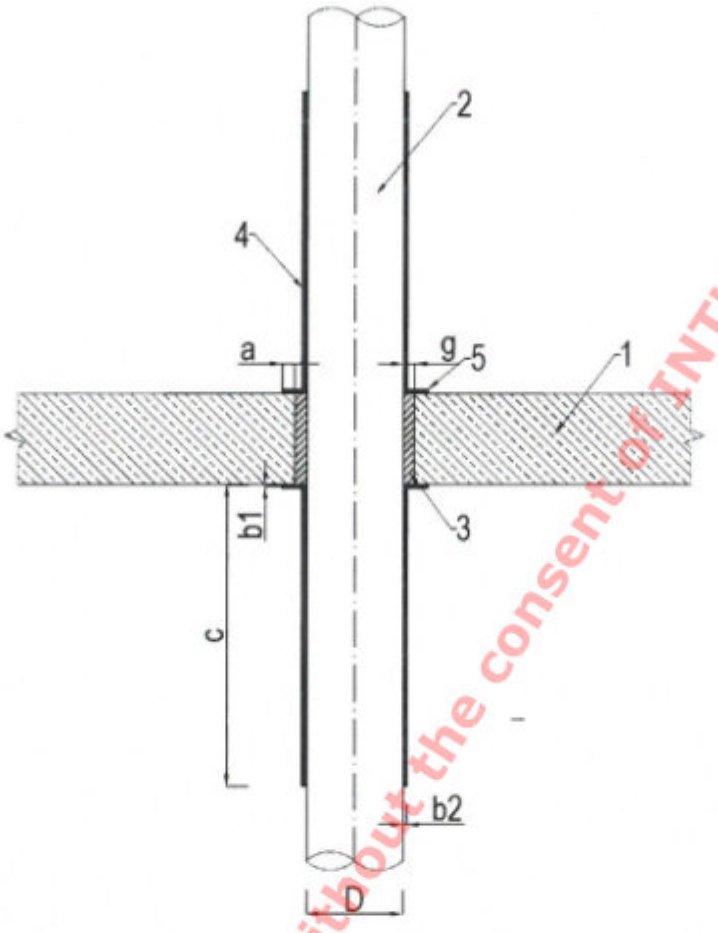
INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B35**
Penetration seals made with use of INTU FR COAT A and INTU FR COAT I Metal pipes penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B35.

Copper pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	500 x 1	EI 240 – C/U EI 240 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	500 x 1	EI 240 – C/U EI 240 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	500 x 1	EI 240 – C/U EI 240 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	500 x 1	EI 240 – C/U EI 240 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	500 x 1	EI 240 – C/U EI 240 – C/C
	54,0 < D ≤ 88,9	2,2 – 14,2	500 x 1	EI 180 – C/U EI 180 – C/C

Metal pipe without insulation penetration seal in rigid floor, made with use of INTU FR COAT I



1 Rigid floor thickness of A ≥ 150 mm and density ≥ 1700 kg/m^3
2 Metal pipe with diameter of D and pipe wall thickness t
3 Cement mortar, thickness g ≤ 20 mm
4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below
5 INTU FR COAT I intumescent paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Copper	D ≤ 6,0	1	500
Copper	D ≤ 54,0	1	500
Copper	D ≤ 88,9	1	500

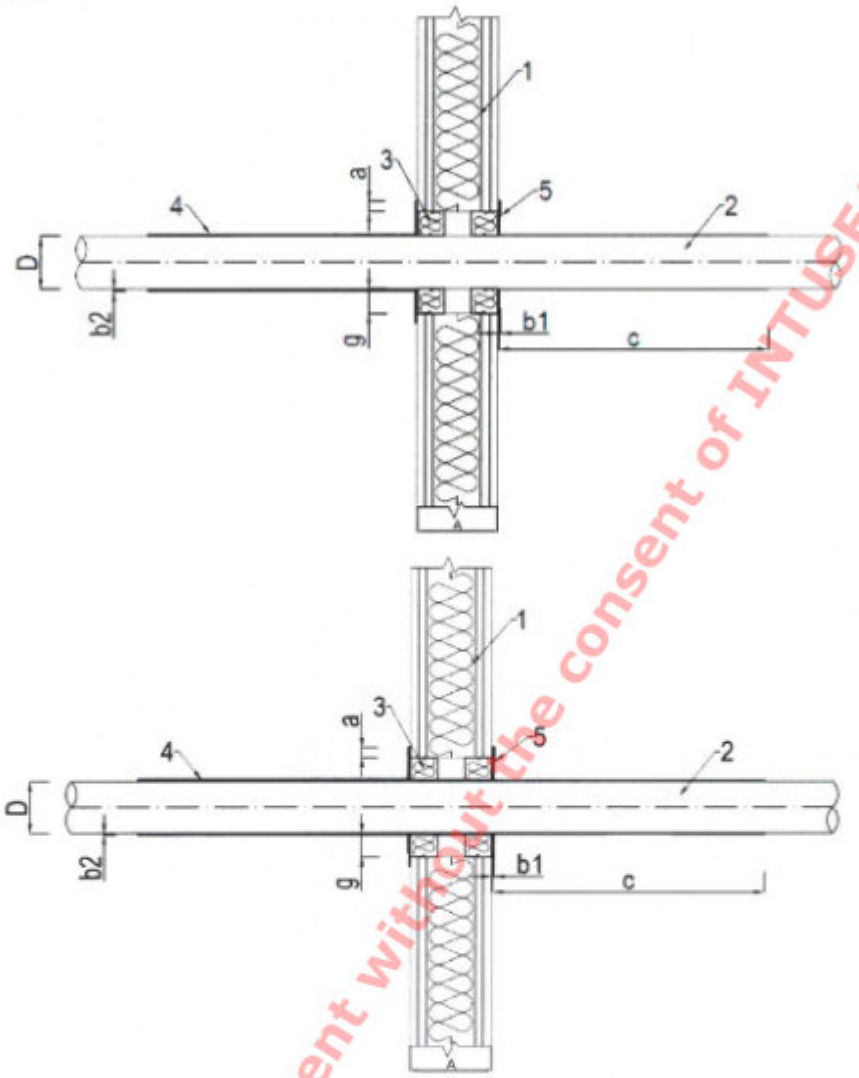
INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B37**
Penetration seals made with use of INTU FR COAT I Metal pipes penetration seals in rigid floor	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B37.

Copper pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Copper	D ≤ 6,0	≥ 0,8	500 x 1	EI 240 – C/U EI 240 – C/C
	6,0 < D ≤ 15,0	≥ 1,0	500 x 1	EI 180 – C/U EI 180 – C/C
	15,0 < D ≤ 18,0	≥ 1,1	500 x 1	EI 180 – C/U EI 180 – C/C
	18,0 < D ≤ 22,0	≥ 1,1	500 x 1	EI 180 – C/U EI 180 – C/C
	22,0 < D ≤ 35,0	1,4 – 14,2	500 x 1	EI 180 – C/U EI 180 – C/C
	35,0 < D ≤ 42,0	1,5 – 14,2	500 x 1	EI 180 – C/U EI 180 – C/C
	42,0 < D ≤ 54,0	1,7 – 14,2	500 x 1	EI 180 – C/U EI 180 – C/C
	54,0 < D ≤ 88,9	2,2 – 14,2	500 x 1	EI 120 – C/U EI 120 – C/C

Metal pipe without insulation penetration seal in flexible wall, made with use of INTU FR COAT A and INTU FR COAT I



1 Flexible wall thickness of A ≥ 125 mm

2 Steel pipe with diameter of D and pipe wall thickness t

3 Mineral wool board density ≥ 150 kg/m^3, thickness ≥ 60 mm, width g ≤ 50 mm or INTU FR BOARD A

4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below

5 INTU FR COAT A ablative paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm; paint cannot contact directly with metal pipe

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B39**
Penetration seals made with use of INTU FR COAT A and INTU FR COAT I Metal pipes penetration seals in flexible wall	of European Technical Assessment ETA-19/0038

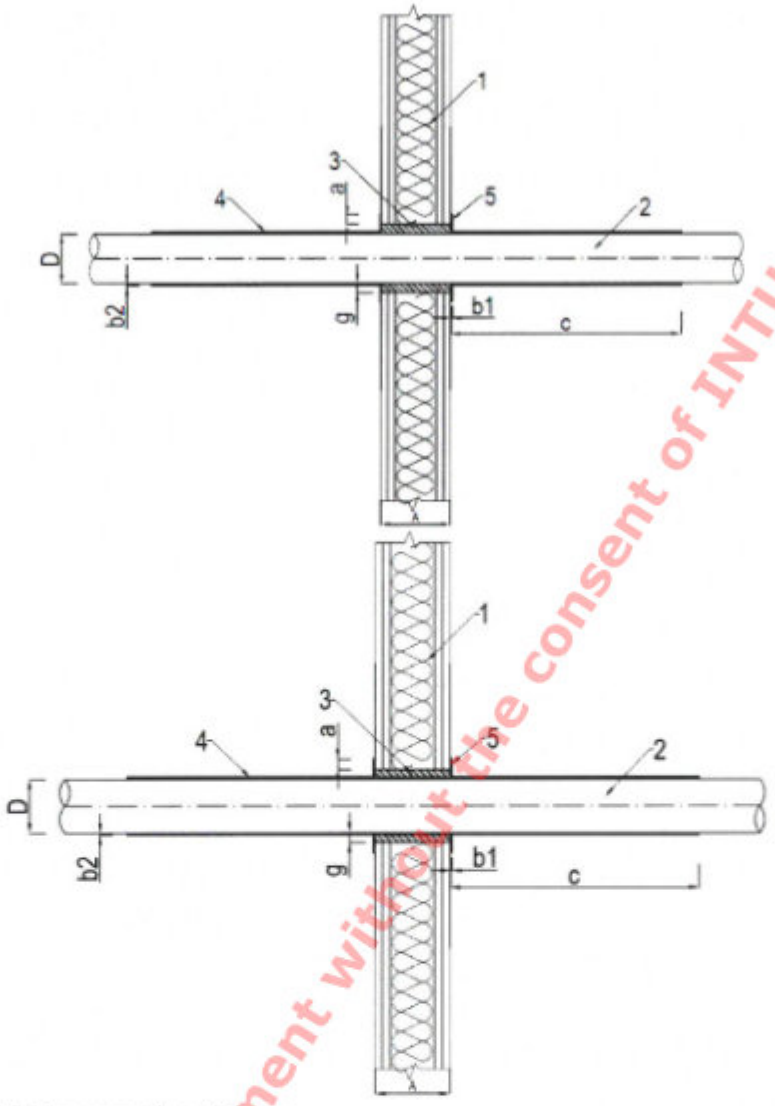
Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B39.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	EI 120 – C/U EI 120 – C/C
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	EI 120 – C/U *) EI 120 – C/C *)

*) pipe painted inside the wall

Metal pipe without insulation penetration seal in flexible wall, made with use of INTU FR COAT I



1 Flexible wall thickness of A ≥ 125 mm
2 Steel pipe with diameter of D and pipe wall thickness t
3 Cement mortar, thickness g ≤ 20 mm
4 INTU FR COAT I intumescent paint; length c and thickness b2, in accordance with table below
5 INTU FR COAT I intumescent paint; thickness b1 ≥ 1 mm, width a ≥ 10 mm

Pipe material	Pipe diameter [mm]	INTU FR COAT I paint thickness, b2 [mm]	INTU FR COAT I paint length, c [mm]
Steel	D ≤ 42,4	1	500
Steel	D ≤ 108,0	1	500

INTU FR MASTIC, INTU FR COAT A, INTU FR COAT I, INTU FR BOARD A	**Annex B41**
Penetration seals made with use of INTU FR COAT I Metal pipes penetration seals in flexible wall	of European Technical Assessment ETA-19/0038

Resistance to fire classification of metal pipes penetration seals, made in accordance with Annex A and Annex B41.

Steel pipes without insulation

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	INTU FR COAT I (on pipe), length x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	500 x 1	EI 90 – C/U EI 90 – C/C
	42,4 < D ≤ 48,3	2,2 – 14,2	500 x 1	EI 60 – C/U EI 60 – C/C
	48,3 < D ≤ 60,3	2,6 – 14,2	500 x 1	EI 60 – C/U EI 60 – C/C
	60,3 < D ≤ 76,1	3,1 – 14,2	500 x 1	EI 60 – C/U EI 60 – C/C
	76,1 < D ≤ 88,9	3,5 – 14,2	500 x 1	EI 60 – C/U EI 60 – C/C
	88,9 < D ≤ 108,0	4,0 – 14,2	500 x 1	EI 60 – C/U EI 60 – C/C