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Member of EOTA
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designated according to Article 29 of the Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment, www.eota.eu)

European Technical Assessment

ETA 14/0033
of 14/02/2014

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:	**UL International (UK) Ltd**
Trade name of the construction product	JOINTS FIRE COMPOUND PRO+
Product family to which the construction product belongs	Fire Stopping and Sealing Product: • Penetration Seals
Manufacturer	Joints L.R. Oy. Teollisuustie 6 51200 Kangasniemi Finland
Manufacturing plant(s)	A003
This European Technical Assessment contains	49 pages including 1 Annex which forms an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	ETAG 026-2, edition 2011, used as European Assessment Document (EAD).

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I. SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

1) JOINTS FIRE COMPOUND PRO+ is a gypsum based mortar material, used to reinstate the fire resistance performance of wall and floor constructions where they have been provided with apertures for the penetrations of multiple services.

2) JOINTS FIRE COMPOUND PRO+ is supplied as a dry material, and is mixed with water to the required ratio prior to installation.

3) JOINTS FIRE COMPOUND PRO+ when mixed is self-supporting in a wall and floor orientation, and may be used with or without a permanent mineral fibre backing material depending upon the require application and classification (see Annex A).

4) JOINTS FIRE WRAP PRO+ are required to be used in conjunction with JOINTS FIRE COMPOUND PRO+ depending upon the required application and classification (see Annex A). JOINTS FIRE WRAP PRO+ are the subject of a separate ETA which is not declared in the document for confidentiality reasons.

5) The applicant submitted a written declaration that JOINTS FIRE COMPOUND PRO+ does not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there.

   In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

2 Specification of the intended uses of the product in accordance with the applicable European Assessment Document (Hereinafter EAD): ETAG 026-2

Detailed information and data is given in Annex A.

1) The intended use of JOINTS FIRE COMPOUND PRO+ is to reinstate the fire resistance performance of flexible wall, rigid wall and floor constructions where they are penetrated by various cables and metallic pipes.

2) The specific elements of construction that the system JOINTS FIRE COMPOUND PRO+ may be used to provide a penetration seal in, are as follows:

   a. Flexible walls: The wall must have a minimum thickness of 100 mm and comprise steel studs lined on both faces with minimum 2 layers of 12.5 mm thick boards.

   b. Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m^3.

   c. Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m^3.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

3) The System JOINTS FIRE COMPOUND PRO+ may be used to provide a penetration seal with cables, cable trays, plastic pipes and metallic pipes with and without insulation (for details see Annex A).

4) The system JOINTS FIRE COMPOUND PRO+ may be used to seal apertures in the separating element up to 2400mm wide by 1200mm high in a wall, and 2400mm by 1200 mm in a floor. The minimum permitted separation between adjacent seals/apertures is 200mm. Services within the system JOINTS FIRE COMPOUND PRO+ seal do not require a minimum separation, except where specifically detailed in Annex A.

5) Services in floors shall be supported at 250mm and 400mm from the top face. Services in walls shall be supported at 270mm and 470mm from both faces of the wall.

6) Precautions are required to be taken to prevent a person stepping onto a blank horizontal penetration seal or falling against a blank vertical, or sloped, penetration seal.

7) The provisions made in this European Technical Assessment are based on an assumed working life of the JOINTS FIRE COMPOUND PRO+ of 10 years, provided that the conditions laid down in sections 4.2/5.1/5.2 for the packaging/transport/ storage/installation/use/repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, 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.

8) Type Z_2: Intended for uses 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

Product-type: Sealant	Intended use: Penetration Seal	
Basic requirement for construction work	Essential characteristic	Performance
	Mechanical resistance and stability	
-	None	Not relevant
Safety in case of fire		
EN 13501-1	Reaction to fire	Class 'A1'
EN 13501-2	Resistance to fire	Annex A
Hygiene, health and environment		
EN 1026:2000	Air permeability (material property)	No performance determined
ETAG 026-2, Annex C	Water permeability (material property)	No performance determined
Declaration of manufacturer	Release of dangerous substances	Declaration of manufacturer
Safety in use		
EOTA TR 001:2003	Mechanical resistance and stability	No performance determined
EOTA TR 001:2003	Resistance to impact/movement	No performance determined
EOTA TR 001:2003	Adhesion	No performance determined
Protection against noise		
EN 10140-2/ EN ISO 717-1	Airborne sound insulation	No performance determined
Energy economy and heat retention		
EN 12664, EN 12667 or EN 12939	Thermal properties	No performance determined
EN ISO 12572 EN 12086	Water vapour permeability	No performance determined
General aspects relating to fitness for use		
ISO 8339: 2005, ISO 9046: 2004 & ISO 7389	Durability and serviceability	Z_2

4 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (HEREINAFTER AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

According to the decision 1999/454/EC – Commission Decision of date 22nd June 1999 on on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, see http://eur-lex.europa.eu/JOIndex.do) of the European Commission[1], as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table(s) applies (apply).

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Fire stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	Any	1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Tasks of the manufacturer:

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European technical Assessment.

The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 8th April 2013 relating to the European Technical Assessment ETA 14/0033 issued on 14/02/2014 which is part of the technical documentation of this European Technical Assessment. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at UL International (UK) Ltd.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

[1] Official Journal of the European Communities L178/52 of 14/7/1999

Other tasks of the manufacturer

Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

- Field of application:
- Building elements for which the linear joint seal or penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Limits in size, minimum thickness etc. of the joint or penetration seal
- Construction of the linear joint seal or penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. cable trays)

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

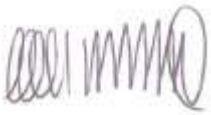
6 Issued on:

14th February 2014

Report by:

C. Johnson
Staff Engineer
Built Environment Sector

Reviewed by:



C. W. Miles
Business Manager – Europe & Latin America
Built Environment Sector

For and on behalf of UL International (UK) Ltd.

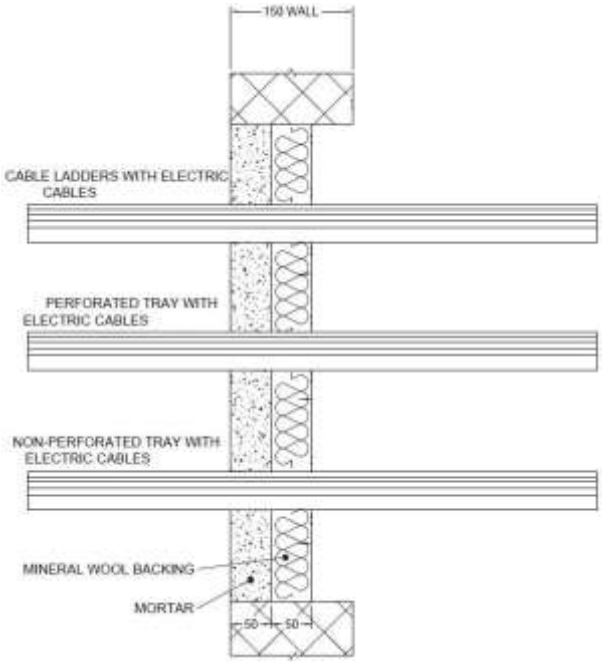
ANNEX A – Resistance to Fire Classification – JOINTS FIRE COMPOUND PRO+

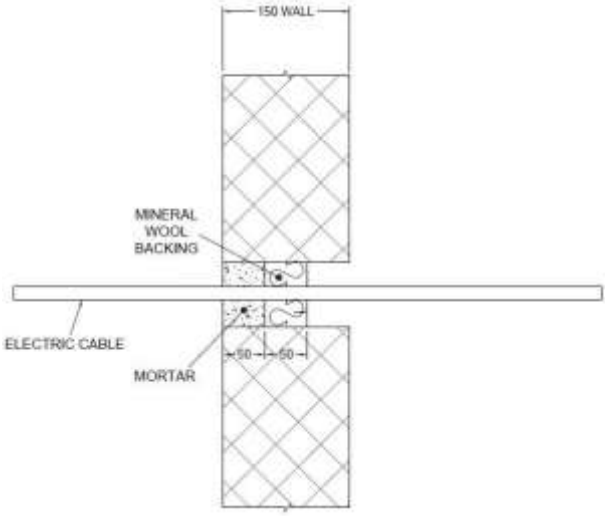
A.1 Rigid wall constructions according to 1.2.1 with wall thickness of minimum 150 mm

A.1.1 Cable penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ backed with mineral fibre board

Penetration Seal: Cables fitted at any position within the aperture (min. separation 25 mm from seal edges), with 50 mm JOINTS FIRE COMPOUND PRO+ to either side of the wall (or at any position in between), backed with 50 mm stone wool board 150 kg/m^3.

Construction details:





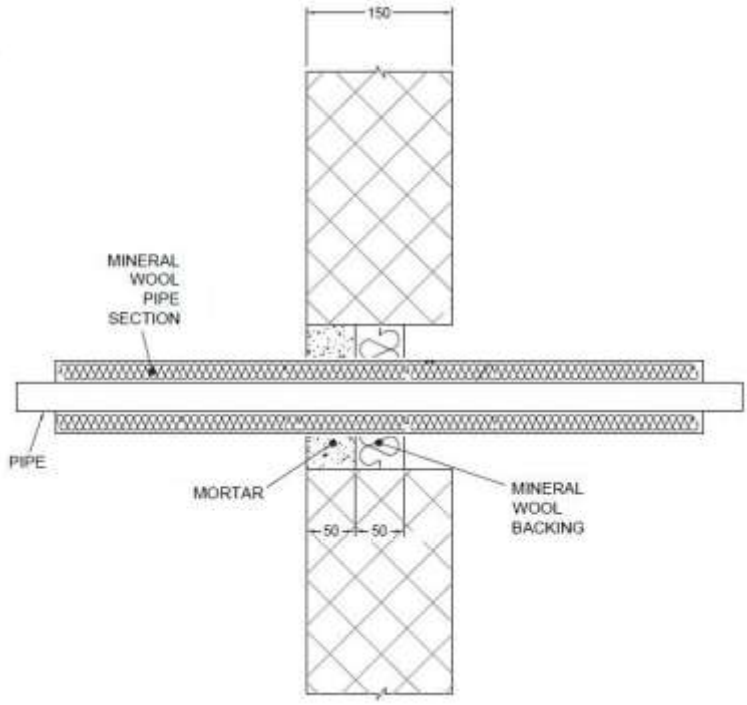
A.1.1.1 Single side penetration seal with cables

Services	Maximum aperture	Classification
None (blank)	2400 mm wide x 1200 mm high	**E 180, EI 120**
Single electrical cables up to 21 mm Ø		**E 180, EI 60**
Single electrical cables up to 21 mm Ø	80 x 80 mm	**E 240, EI 60**
Electrical cables up to 21 mm Ø (single, bundled and on trays)	2400 mm wide x 1200 mm high	**E 180, EI 60**
Electrical cables up to 50 mm Ø (single, bundled and on trays)		**E 180, EI 45**
Electrical cables up to 80 mm Ø (single, bundled and on trays)		**E 120, EI 45**
Telecommunication cables up to 21 mm Ø (single or bundles up to 100 mm Ø)		**E 180, EI 90**
Steel cable trays & ladders		**E 180, EI 60**
Non-sheathed wires up to 17 mm Ø		**E 180, EI 45**
Non-sheathed wires up to 24 mm Ø		**E 180, EI 30**
Copper conduit up to 16 mm Ø		**E 180 C/U, EI 30 C/U**
Steel conduit up to 16 mm Ø		**E 180 C/U, EI 60 C/U**
PVC conduit up to 16 mm Ø		**E 180 C/U, E 180 C/C, EI 60 C/U, EI 60 C/C**

A.1.2 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ backed with mineral fibre board

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes (single) fitted at any position within the aperture (min. separation 30 mm from seal edges, with 50 mm JOINTS FIRE COMPOUND PRO+ to either sides of the wall (or any position in between), backed with 50 mm stone wool 150 kg/m^3.

Construction details:



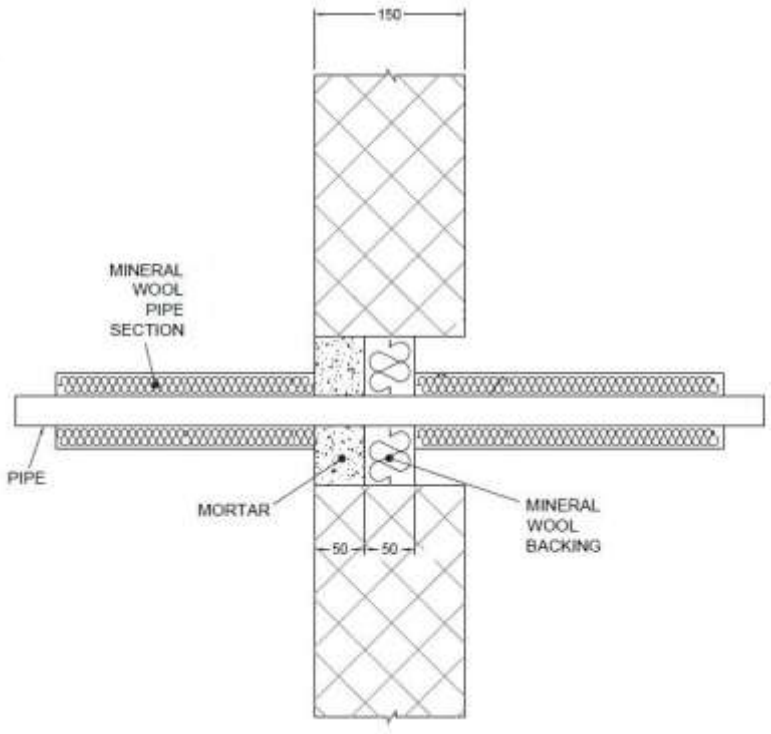
A.1.2.1 Single side penetration seal with pipes

Services	Maximum aperture	Insulation	Classification
Steel pipe 219 diameter/ 5-14.2 mm wall	2400 mm wide x 1200 mm high	30 mm stone wool 80 kg/m^3	**E 120 C/U, EI 90 C/U**

A.1.3 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ backed with mineral fibre board

Penetration Seal: LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic and composite pipes (single) fitted at any position within the aperture (min. separation 30 mm from seal edges, with 50 mm JOINTS FIRE COMPOUND PRO+ to either sides of the wall (or any position in between), backed with 50 mm stone wool 150 kg/m^3.

Construction details:

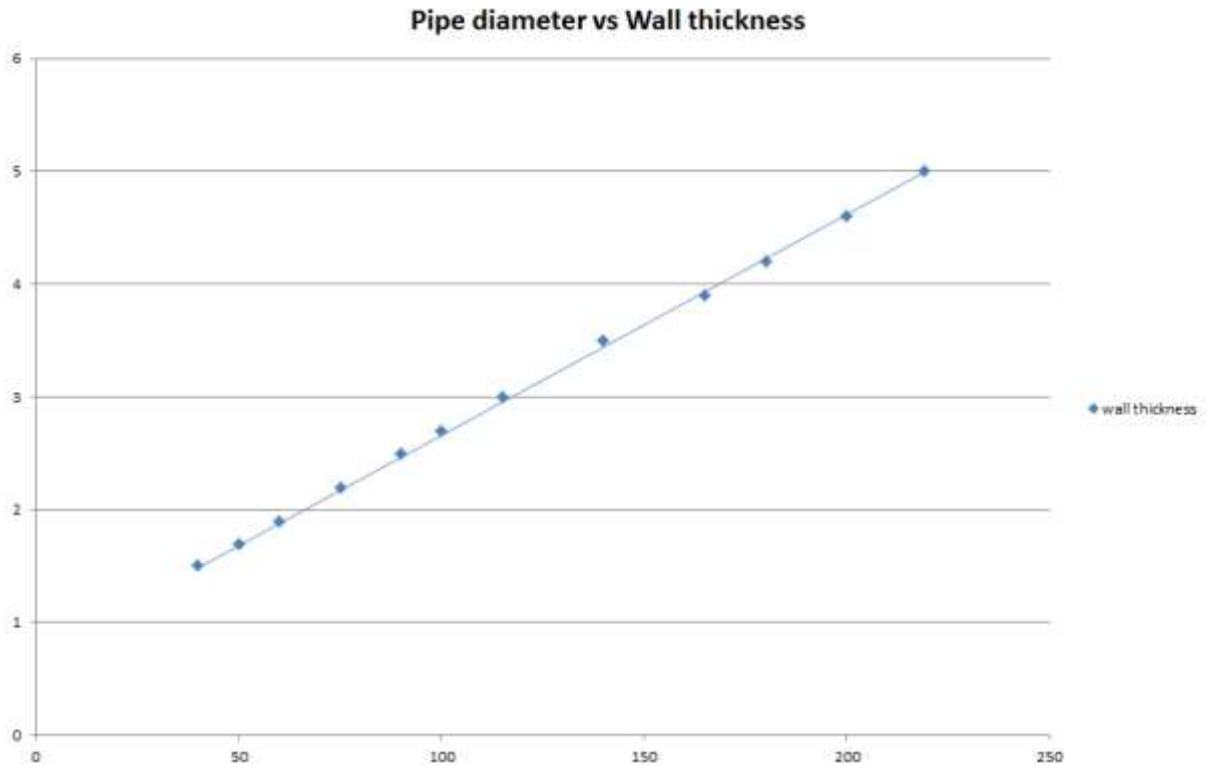


A.1.3.1 Single side penetration seal with pipes

Services	Maximum aperture	Insulation	Classification
Copper pipe up to 12 mm diameter/ 0.9-5 mm wall	70 x 70 mm	1000 mm long, 20 mm stone wool 80 kg/m^3	**EI 240 C/C**
Copper pipe up to 54 mm diameter/ 1-14.2 mm wall	115 x 115 mm	1000 mm long, 20 mm stone wool 80 kg/m^3	**E 240 C/C, EI 120 C/C**
Copper pipe up to 54 mm diameter/ 1-14.2 mm wall	2400 mm wide x 1200 mm high	1000 mm long, 20 mm stone wool 80 kg/m^3	**E 180 C/C, EI 120 C/C**
75 mm Alupex composite pipe with 7.5 mm wall		600 mm long, 32 mm Kaiflex ST insulation	**EI 60 C/C**

Services Mild or stainless steel pipe	Maximum aperture	Insulation	Classification
40 mm diameter/1.5-14.2 mm wall*	100 x 100 mm	1000 mm long, 20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1.5-14.2 mm wall*	2400 mm wide x 1200 mm high		**E 180 C/U, EI 120 C/U**
40 mm diameter/1.5-14.2 mm wall*		1000 mm long, 30 mm Stone wool insulation 80 kg/m^3	**E 120 C/U, EI 90 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.9-14.2 mm wall*			
75 mm diameter/2.2-14.2 mm wall*			
90 mm diameter/2.5-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3-14.2 mm wall*			
140 mm diameter/3.5-14.2 mm wall*			
165 mm diameter/ 3.9-14.2 mm wall*			
180 mm diameter/ 4.2-14.2 mm wall*			
200 mm diameter/ 4.6-14.2 mm wall*			
219 mm diameter/ 5.0-14.2 mm wall*			

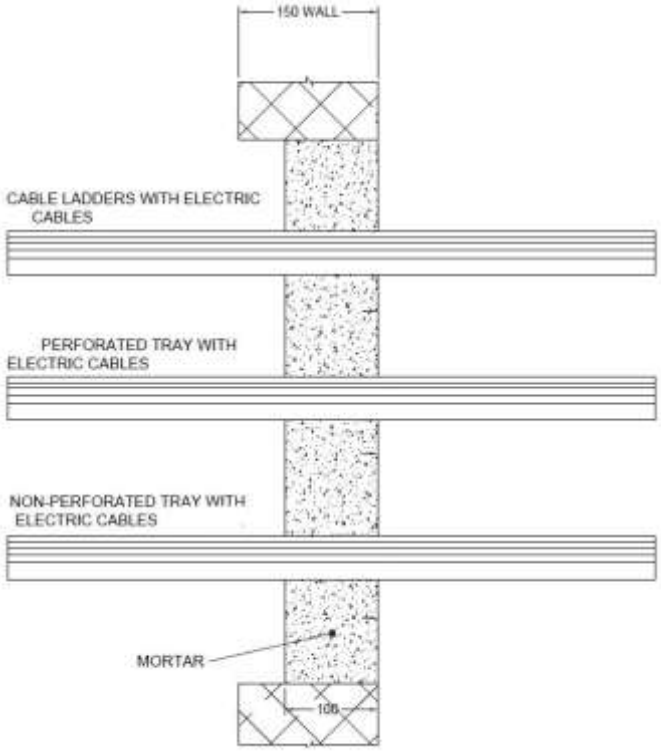
* Typical pipe diameters shown, see below graph for intermediate sizes



A.1.4 Cable penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: Cables fitted at any position within the aperture (min. separation 25 mm from seal edges), with 100 mm JOINTS FIRE COMPOUND PRO+ to either side of the wall (or at any position in between).

Construction details:



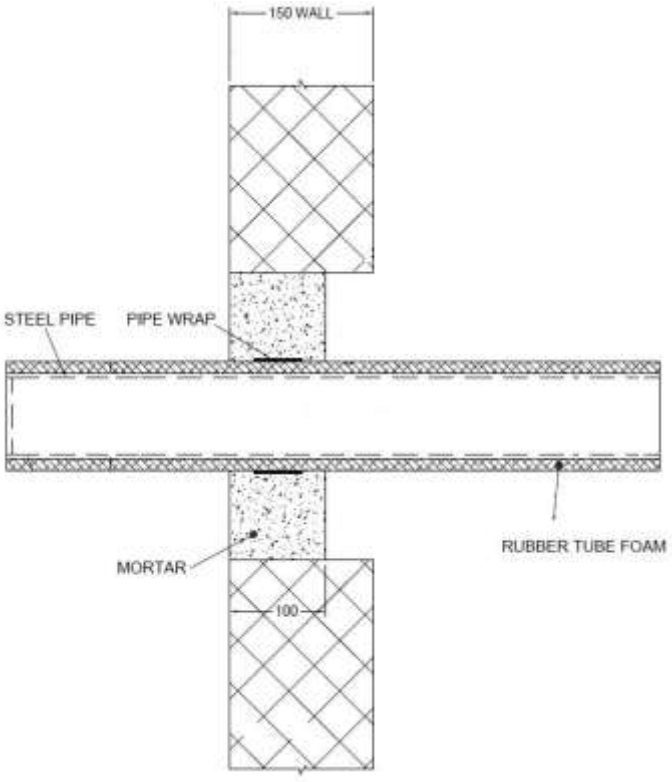
A.1.4.1 Single side penetration seal with cables

Services	Maximum aperture	Classification
None (blank)	2400 mm wide x 1200 mm high	**EI 240**
Electrical cables up to 21 mm Ø (single, bundled and on trays)		**E 240, EI 60**
Electrical cables up to 80 mm Ø (single, bundled and on trays)		
Telecommunication cables up to 21 mm Ø (single or bundles up to 100 mm Ø)		**EI 120**
Steel cable trays & ladders		**E 120, EI 60**
Non-sheathed cables up to 24 mm Ø		
Copper conduit up to 16 mm Ø		**E 180 C/U, EI 30 C/U**
Steel conduit up to 16 mm Ø		**E 180 C/U, EI 60 C/U**
PVC conduit up to 16 mm Ø		**EI 240 C/U, EI 240 C/C**

A.1.5 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 10 mm from seal edges), with 100 mm JOINTS FIRE COMPOUND PRO+ to either side of the wall. JOINTS FIRE WRAP PRO+ are required to be centrally within the seal for pipes with combustible insulation. Maximum seal size 2400 mm wide x 1200 mm high

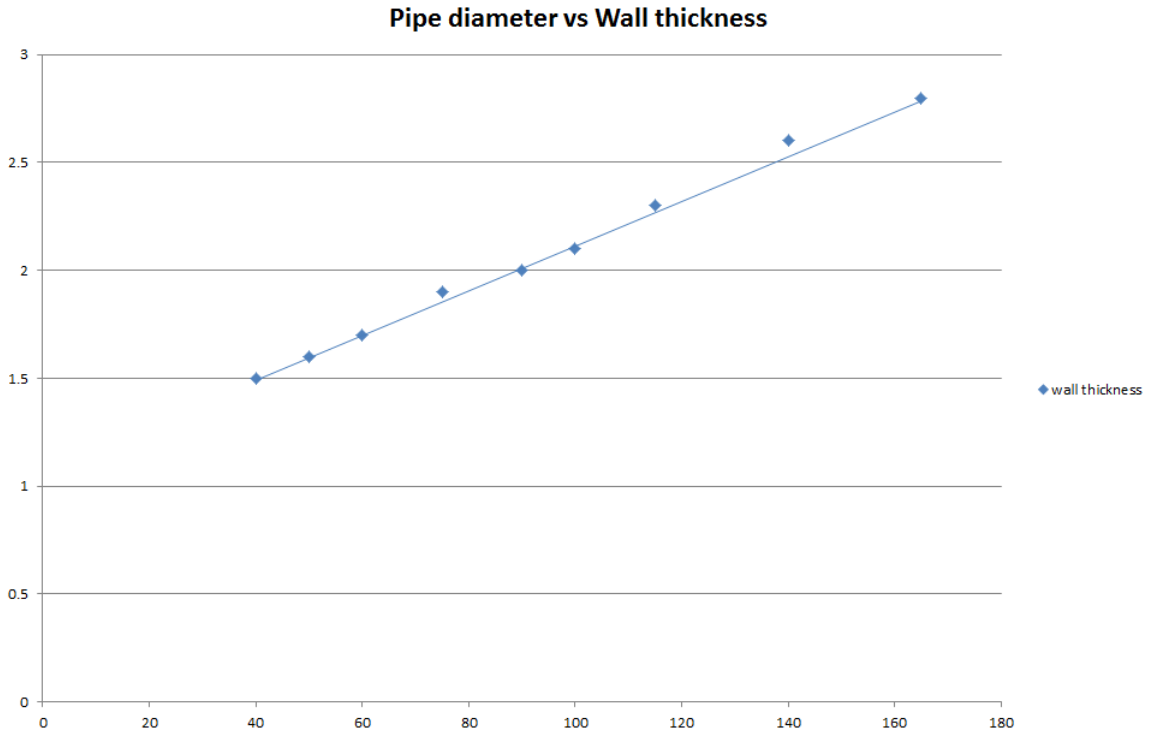
Construction details:



A.1.5.1 Single side penetration seal with pipes

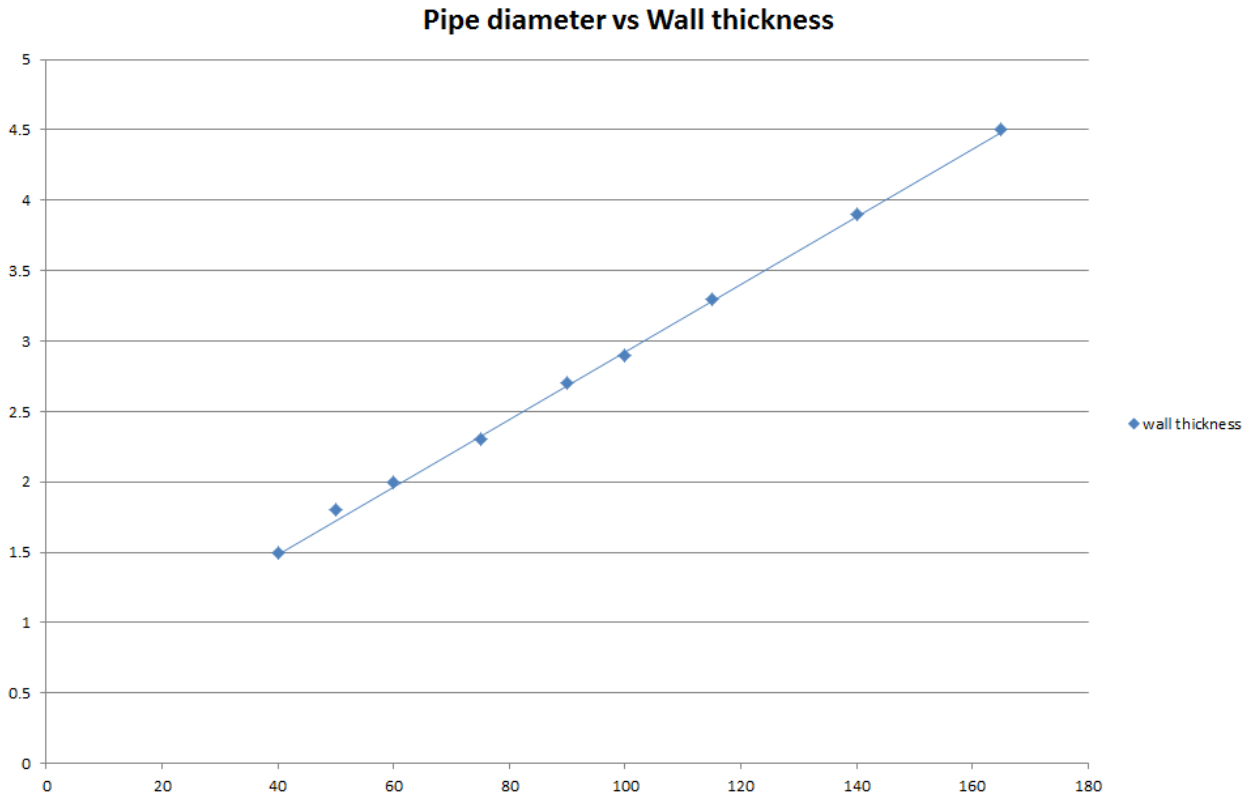
Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/1.5-14.2 mm wall	1 off 50 x 3.6mm JOINTS FIRE WRAP PRO+ Wrap, fitted central	13 mm Kaiflex ST insulation	**EI 240 C/U**
165 mm diameter/4.5-14.2 mm wall		9 mm Kaiflex ST insulation	**E 240 C/U, EI 30 C/U**
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 1.8mm JOINTS FIRE WRAP PRO+ Wrap, fitted central	13 -19 mm Kaiflex ST insulation	**E 240 C/U, EI 60 C/U**
50 mm diameter/1.6-14.2 mm wall*			
60 mm diameter/1.7-14.2 mm wall*			
75 mm diameter/1.9-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.1-14.2 mm wall*			
115 mm diameter/2.3-14.2 mm wall*			
140 mm diameter/2.6-14.2 mm wall*			
165 mm diameter/2.8-14.2 mm wall*			

* Typical pipe diameters shown, see below graph for intermediate sizes



Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 3.6mm JOINTS FIRE WRAP PRO+ Wrap, fitted central	13-25 mm Kaiflex ST insulation	**E 180 C/U, EI 60 C/U**
50 mm diameter/1.8-14.2 mm wall*			
60 mm diameter/2-14.2 mm wall*			
75 mm diameter/2.3-14.2 mm wall*			
90 mm diameter/2.7-14.2 mm wall*			
100 mm diameter/2.9-14.2 mm wall*			
115 mm diameter/3.3-14.2 mm wall*			
140 mm diameter/3.9-14.2 mm wall*			
165 mm diameter/4.5-14.2 mm wall*			

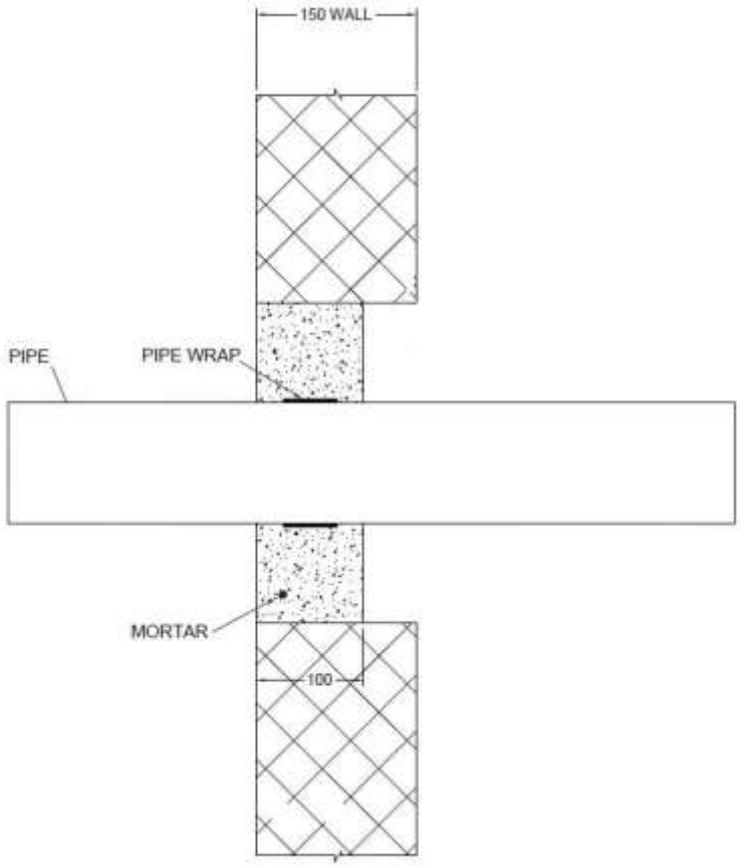
* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
wall thickness

A.1.6 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: plastic pipes fitted at any position within the aperture (min. separation 10 mm from seal edges), with 100 mm JOINTS FIRE COMPOUND PRO+ to either side of the wall. JOINTS FIRE WRAP PRO+ are required to be centrally within the seal. Maximum seal size 2400 mm wide x 1200 mm high

Construction details:



A.1.6.1 Single side penetration seal with pipes

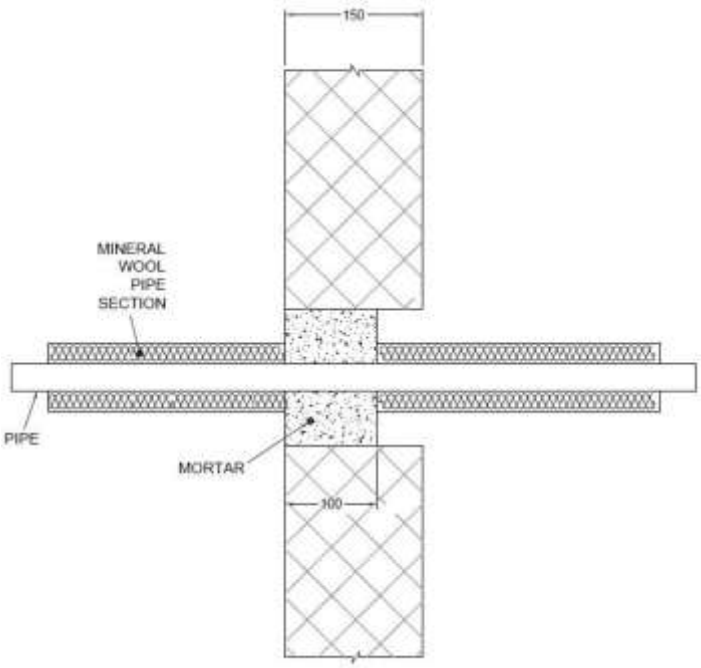
Services	Wrap	Insulation	Classification
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1*			
315 mm diameter/9.2 mm wall	1 off 75 x 18 mm JOINTS FIRE WRAP PRO+, fitted central	None	**EI 120 C/C**

* In Germany the pipes have additionally to comply with DIN 19531-10

A.1.7 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic pipes (single) fitted at any position within the aperture (min. separation 20 mm from seal edges, with 100 mm JOINTS FIRE COMPOUND PRO+ to either sides of the wall (or any position in between)

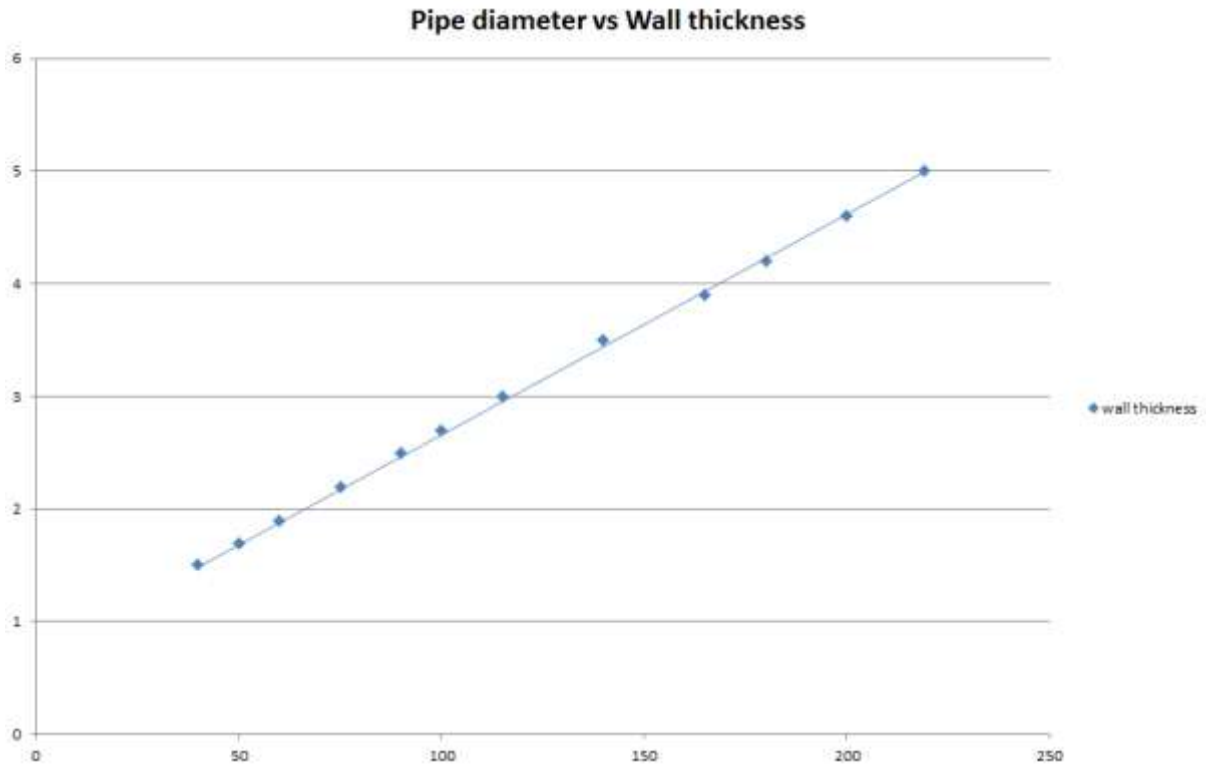
Construction details:



A.1.7.1 Single side penetration seal with pipes

Services Mild or stainless steel pipe	Maximum aperture	Insulation	Classification
40 mm diameter/1.5-14.2 mm wall*	2400 mm wide x 1200 mm high	20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1.5-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3	**E 240 C/U, EI 120 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.9-14.2 mm wall*			
75 mm diameter/2.2-14.2 mm wall*			
90 mm diameter/2.5-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3-14.2 mm wall*			
140 mm diameter/3.5-14.2 mm wall*			
165 mm diameter/ 3.9-14.2 mm wall*			
180 mm diameter/ 4.2-14.2 mm wall*			
200 mm diameter/ 4.6-14.2 mm wall*			
219 mm diameter/ 5.0-14.2 mm wall*			

* Typical pipe diameters shown, see below graph for intermediate sizes

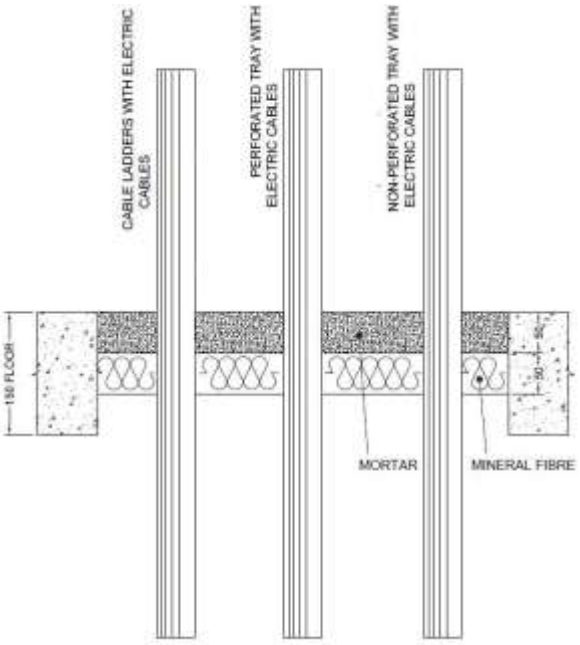


A.2 Rigid floor constructions according to 1.2.1 with floor thickness of minimum 150 mm

A.2.1 Cable penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ backed with mineral fibre board

Penetration Seal: Cables fitted at any position within the aperture (min. separation 30 mm from seal edges), with 50 mm JOINTS FIRE COMPOUND PRO+ flush with the top of the floor, backed with 50 mm stone wool 150 kg/m^3

Construction details:



A.2.1.1 Single side penetration seal with cables

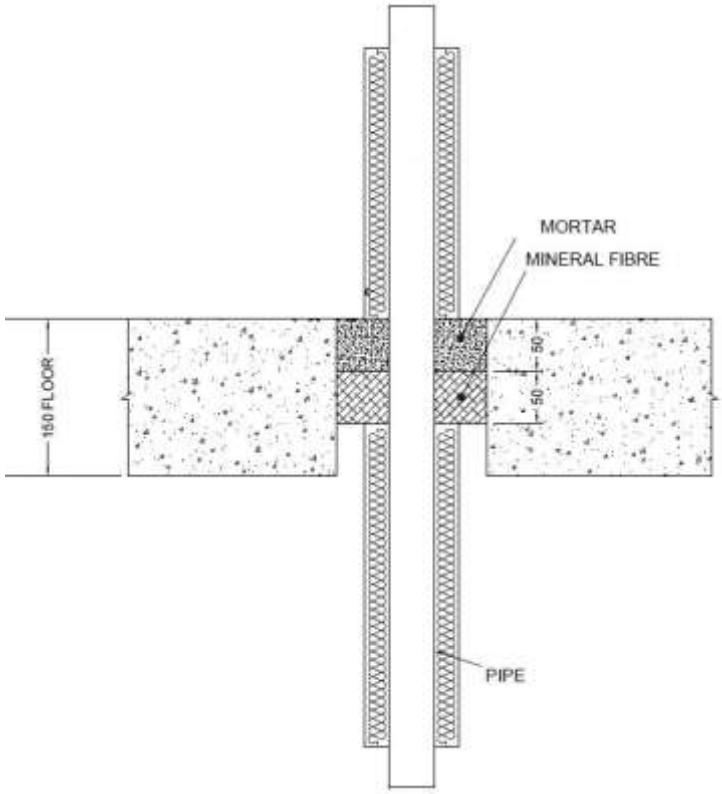
Services	Maximum aperture	Classification
None (blank)	2400 mm x 1200 mm	**EI 180**
Single* electrical cables up to 21 mm Ø		**E 180, EI 90**
Electrical cables up to 21 mm Ø (single, bundled and on trays)		**E 180, EI 60**
Electrical cables up to 80 mm Ø (single, bundled and on trays)		**E 90, EI 45**
Telecommunication cables up to 21 mm Ø (single or bundles up to 100 mm Ø)		**EI 180**
Steel cable trays & ladders		**E 90, EI 60**
Non-sheathed wires up to 17 mm Ø		**E 180, EI 60**
Non-sheathed wires up to 24 mm Ø		**E 180, EI 30**
PVC conduit up to 16 mm Ø		**EI 180 C/U, EI 180 C/C**

* To be separated by at least 100 mm

A.2.2 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ backed with mineral fibre board

Penetration Seal: 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic pipes (single) fitted at any position within the aperture (min. separation 30 mm from seal edges, with 50 mm JOINTS FIRE COMPOUND PRO+ flush with the top of floor, backed with 50 mm stone wool 150 kg/m^3

Construction details:

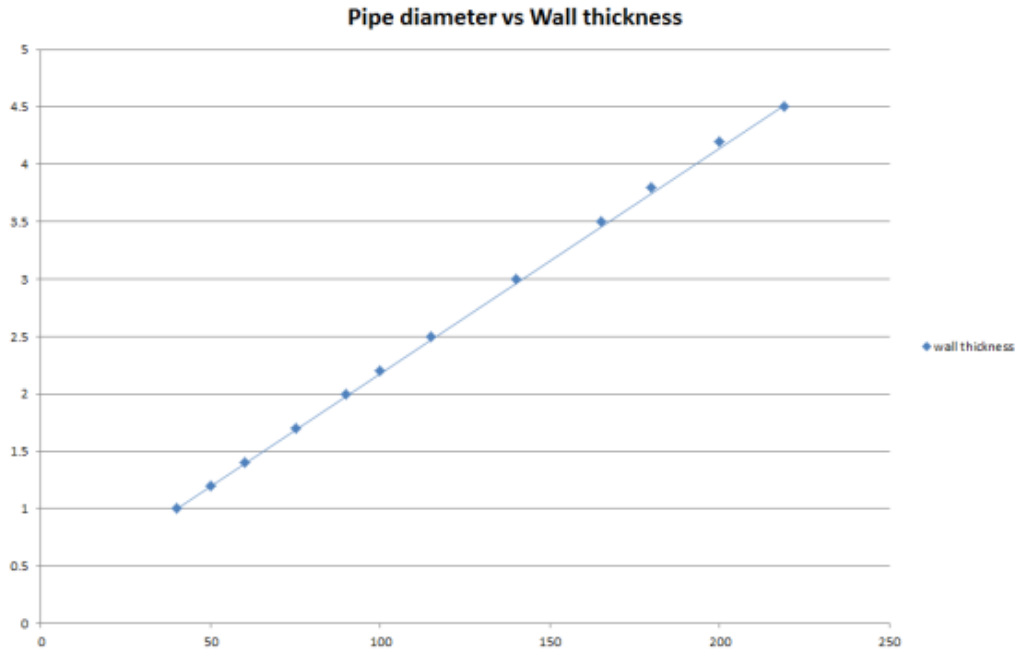


A.2.2.1 Single side penetration seal with pipes

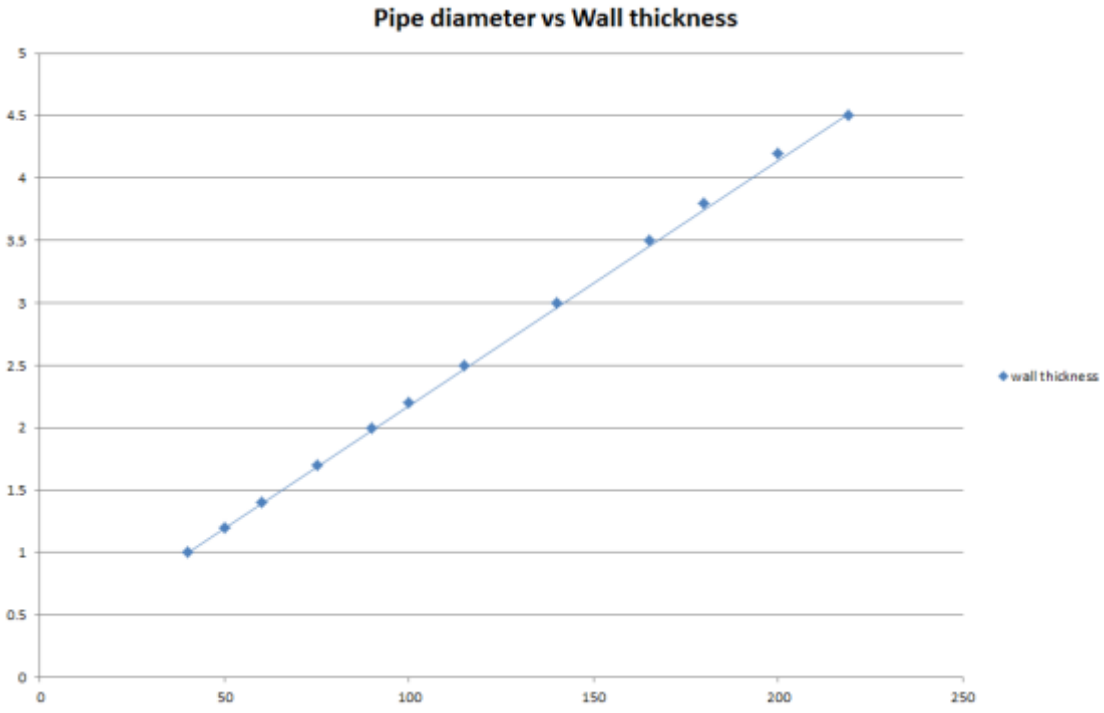
Services	Maximum aperture	Insulation	Classification
Copper pipe up to 12 mm diameter/ 1-5 mm wall	70 x 70 mm	20 mm stone wool 80 kg/m^3	**EI 240 C/C**
Copper pipe up to 54 mm diameter/ 1-14.2 mm wall	115 x 115 mm		**E 240 C/C, EI 180 C/C**
Copper pipe up to 54 mm diameter/ 1-14.2 mm wall	2400 mm wide x 1200 mm high		**EI 180 C/C**

Services Mild or stainless steel pipe	Maximum aperture	Insulation	Classification
40 mm diameter/1-14.2 mm wall*	280 x 280 mm	20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3	**E 240 C/U, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*			
60 mm diameter/1.4-14.2 mm wall*			
75 mm diameter/1.7-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.2-14.2 mm wall*			
115 mm diameter/2.5-14.2 mm wall*			
140 mm diameter/3-14.2 mm wall*			
165 mm diameter/3.5-14.2 mm wall*			
180 mm diameter/3.8-14.2 mm wall*			
200 mm diameter/4.2-14.2 mm wall*			
219 mm diameter/4.5-14.2 mm wall*			

* Typical pipe diameters shown, see below graph for intermediate sizes



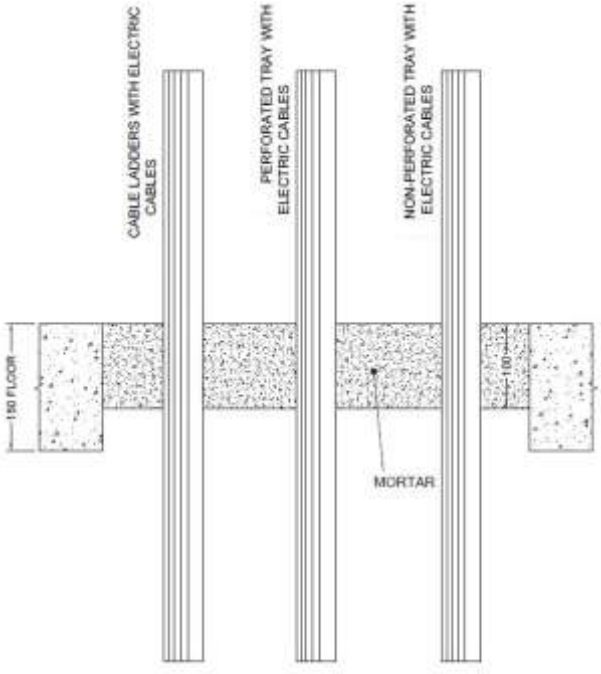
Services Mild or stainless steel pipe	Maximum aperture	Insulation	Classification
40 mm diameter/1-14.2 mm wall*	2400 mm x 1200 mm	20 mm Stone wool insulation 80 kg/m^3	**EI 180 C/U**
40 mm diameter/1-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3	**E 180 C/U, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*			
60 mm diameter/1.4-14.2 mm wall*			
75 mm diameter/1.7-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.2-14.2 mm wall*			
115 mm diameter/2.5-14.2 mm wall*			
140 mm diameter/3-14.2 mm wall*			
165 mm diameter/3.5-14.2 mm wall*			
180 mm diameter/3.8-14.2 mm wall*			
200 mm diameter/4.2-14.2 mm wall*			
219 mm diameter/4.5-14.2 mm wall*			



A.2.3 Cable penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: Cables fitted at any position within the aperture (min. separation 100 mm from seal edges), with 100 mm JOINTS FIRE COMPOUND PRO+ flush with the top of the floor

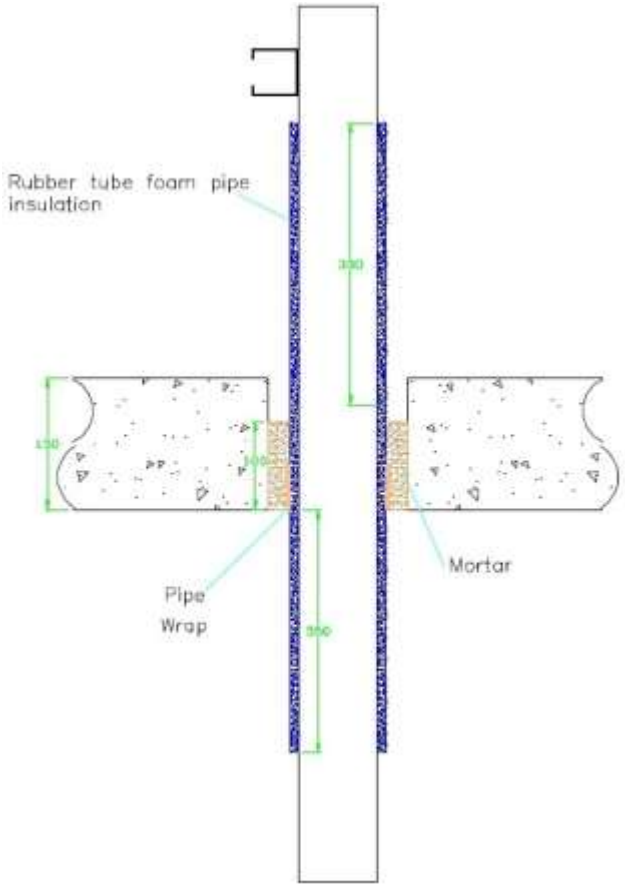
Construction details:



A.2.3.1 Single side penetration seal with cables

Services	Maximum aperture	Classification
None (blank)	2400 mm x 1200 mm	**EI 180**
Electrical cables up to 50 mm Ø (single, bundled and on trays)		**E 180, EI 60**
Electrical cables up to 80 mm Ø (single, bundled and on trays)		**E 120, EI 60**
Telecommunication cables up to 21 mm Ø (single or bundles up to 100 mm Ø)		**E 180, EI 120**
Steel cable trays & ladders		**E 120, EI 60**
Non-sheathed cables up to 17 mm Ø		**E 180, EI 90**
Non-sheathed cables up to 24 mm Ø		**E 180, EI 20**
PVC conduit up to 16 mm Ø		**EI 180 C/U, EI 180 C/C**

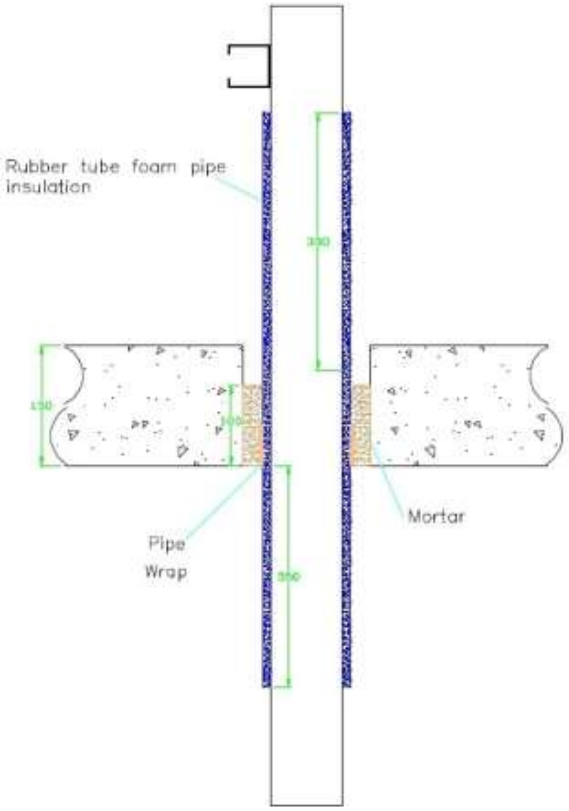
A.2.4 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 25 mm from seal edges and 100 mm from other services), with 100 mm JOINTS FIRE COMPOUND PRO+ at any position within the floor. JOINTS FIRE WRAP PRO+ are required to be fitted around combustible pipe insulation. Maximum seal size 400 mm wide x 400 mm long.
Construction details: 

A.2.4.1 Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
Copper pipe			
12 mm diameter/1 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to the soffit	9 mm Kaiflex ST insulation	**EI 240 C/C**
12-54 mm diameter/1-1.2 mm wall		13-25 mm Kaiflex ST insulation	**E 240 C/C, EI 60 C/C**
Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)			
16 mm diameter/2.25 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to the soffit	9 mm Kaiflex ST insulation	**EI 240 C/C**
16 mm diameter/2.25 mm wall		9-13 mm Kaiflex ST insulation	**E 240 C/C, EI 90 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			
16 mm diameter/2.25 mm wall		13-25 mm Kaiflex ST insulation	**E 180 C/C, EI 90 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			

A.2.5 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 25 mm from seal edges and 100 mm from other services), with 100 mm JOINTS FIRE COMPOUND PRO+ at any position within the floor. JOINTS FIRE WRAP PRO+ are required to be fitted around combustible pipe insulation. Maximum seal size 2400 mm wide x 1200 mm long
Construction details: 

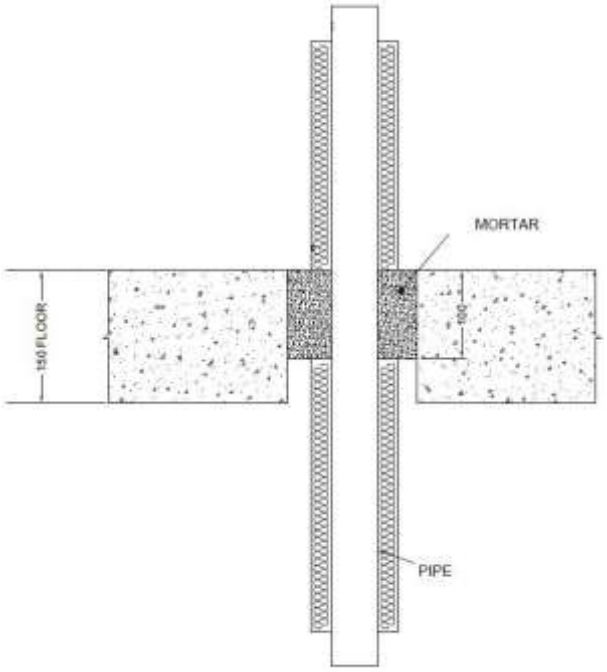
A.2.5.1 Single side penetration seal with pipes

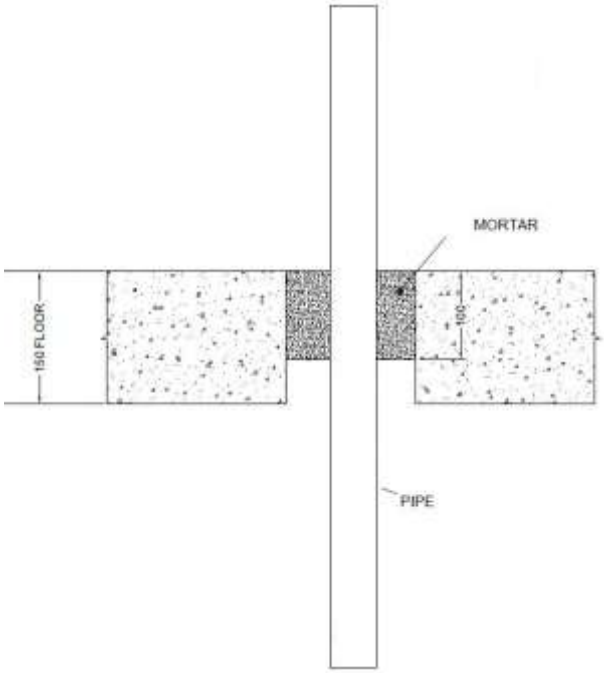
Services	Wrap	Insulation	Classification
Copper pipe			
12 mm diameter/1 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to the soffit	9 mm Kaiflex ST insulation	**EI 180 C/C**
12-54 mm diameter/1-1.2 mm wall		13-25 mm Kaiflex ST insulation	**E 180 C/C, EI 60 C/C**
Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)			
16 mm diameter/2.25 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to the soffit	9 mm Kaiflex ST insulation	**EI 180 C/C**
16 mm diameter/2.25 mm wall		13-25 mm Kaiflex ST insulation	**E 180 C/C, EI 90 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			

A.2.6 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: 1000 mm (min.)* LI (Local Interrupted) or CI (Continuous Interrupted) insulated and non-insulated metallic and composite pipes (single) fitted at any position within the aperture (min. separation 30 mm from seal edges), with 100 mm JOINTS FIRE COMPOUND PRO+ flush with the top of the floor

Construction details:



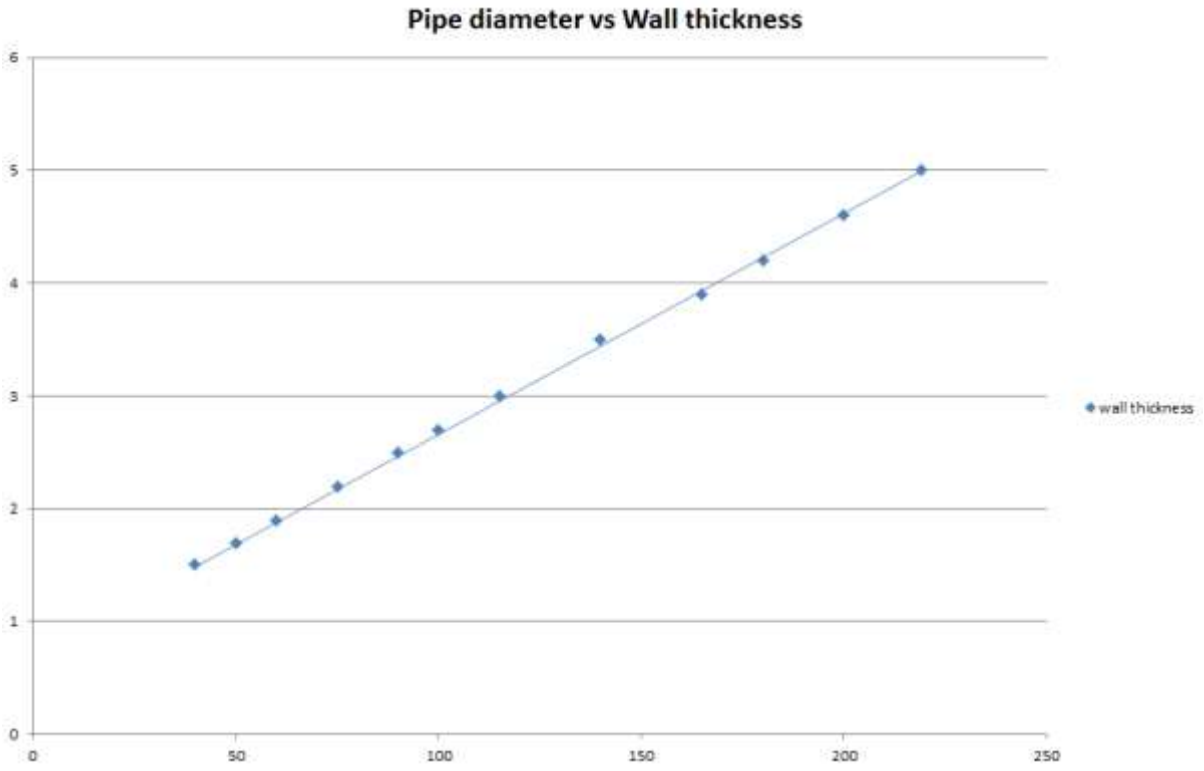


A.2.6.1 Single side penetration seal with pipes

Services	Maximum Aperture	Insulation	Classification
Up to 16 mm diameter steel pipe 1.5-7 mm wall	70 x 70 mm	None	**E 240 C/C, EI 120 C/C**
	2400 mm x 1200 mm		**E 180 C/C, EI 120 C/C**
Up to 54 mm diameter Copper pipe 1.5-14.2 mm wall			**E 120 C/C, EI 20 C/C**
75 mm Alupex composite pipe with 4.6 mm wall	500 x 500	None	**E 240 U/C, EI 20 U/C**
	2400 mm x 1200 mm		**E 180 U/C, EI 20 U/C**

Services Mild or stainless steel pipe	Maximum Aperture	Insulation	Classification
40 mm diameter/1.5-14.2 mm wall*	100 x 100 mm	20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1.5-14.2 mm wall*	280 x 280 mm	30 mm Stone wool insulation 80 kg/m^3	**E 240 C/U, EI 120 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.8-14.2 mm wall*			
75 mm diameter/2.1-14.2 mm wall*			
90 mm diameter/2.3-14.2 mm wall*			
100 mm diameter/2.5-14.2 mm wall*			
115 mm diameter/2.8-14.2 mm wall*			
140 mm diameter/3.2-14.2 mm wall*			
165 mm diameter/ 3.6-14.2 mm wall*			
180 mm diameter/ 3.9-14.2 mm wall*			
200 mm diameter/ 4.2-14.2 mm wall*			
219 mm diameter/ 4.5-14.2 mm wall*			
40 mm diameter/1.5-14.2 mm wall*	2400 mm wide by 1200 mm high	20 mm Stone wool insulation 80 kg/m^3	**EI 180 C/U**
40 mm diameter/1.5-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3	**E 180 C/U, EI 120 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.8-14.2 mm wall*			
75 mm diameter/2.1-14.2 mm wall*			
90 mm diameter/2.3-14.2 mm wall*			
100 mm diameter/2.5-14.2 mm wall*			
115 mm diameter/2.8-14.2 mm wall*			
140 mm diameter/3.2-14.2 mm wall*			
165 mm diameter/ 3.6-14.2 mm wall*			
180 mm diameter/ 3.9-14.2 mm wall*			
200 mm diameter/ 4.2-14.2 mm wall*			
219 mm diameter/ 4.5-14.2 mm wall*			

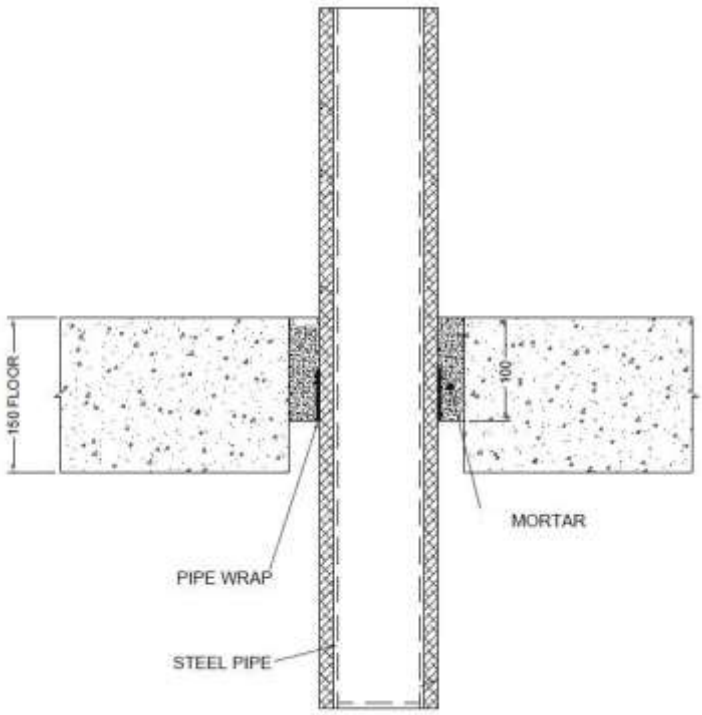
* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
6
5
4
3
2
1
0
0
50
100
150
200
250
wall thickness

A.2.7 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 40 mm from seal edges and 100 mm from other services), with 100 mm JOINTS FIRE COMPOUND PRO+ to the top surface of the floor. JOINTS FIRE WRAP PRO+ are required to be fitted around combustible pipe insulation. Maximum seal size 2400 mm wide x 1200 mm high

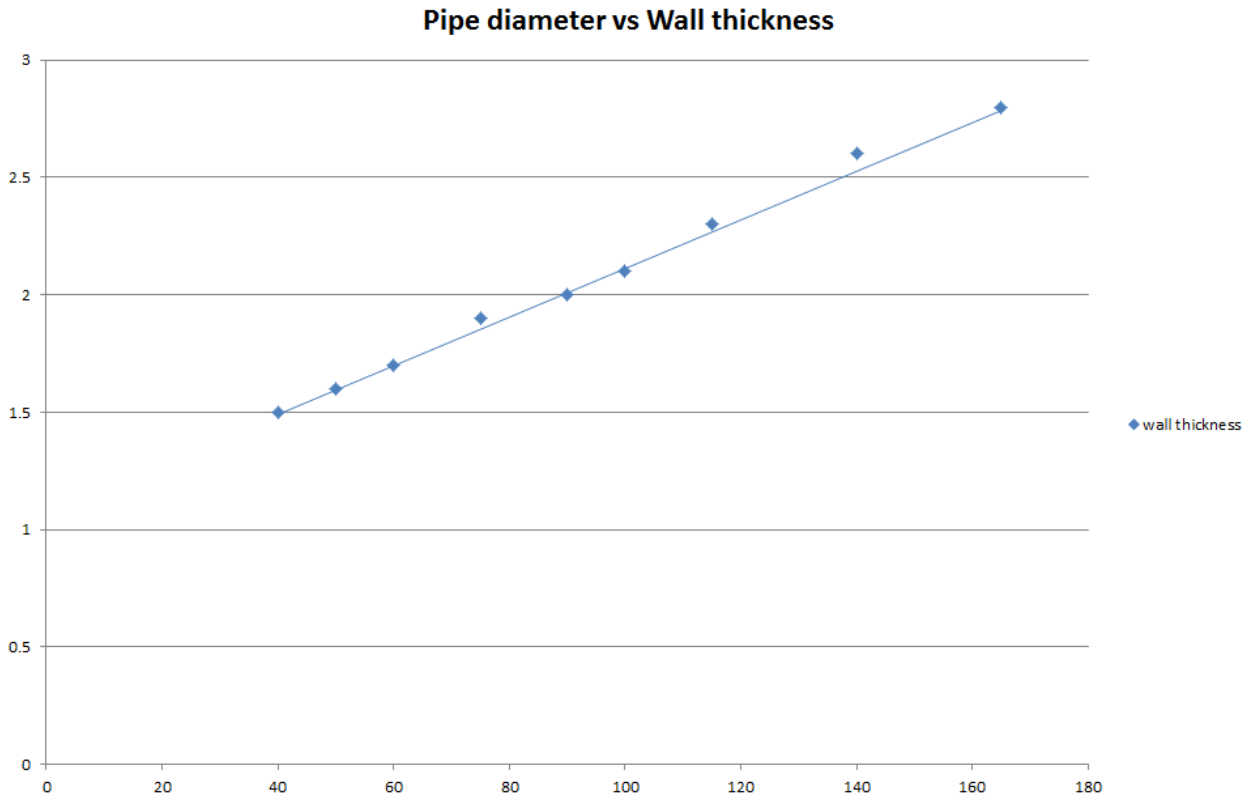
Construction details:



A.2.7.1 Single side penetration seal with cables

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/-14.2 mm wall	1 off 50 x 1.8 mm JOINTS FIRE WRAP PRO+, fitted at soffit	13 mm Kaiflex ST insulation	**EI 180 C/U**
40 mm diameter/1.5-14.2 mm wall*		13 -19 mm Kaiflex ST insulation	**E 180 C/U, EI 120 C/U**
50 mm diameter/1.6-14.2 mm wall*			
60 mm diameter/1.7-14.2 mm wall*			
75 mm diameter/1.9-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.1-14.2 mm wall*			
115 mm diameter/2.3-14.2 mm wall*			
140 mm diameter/2.6-14.2 mm wall*			
165 mm diameter/2.8-14.2 mm wall*			

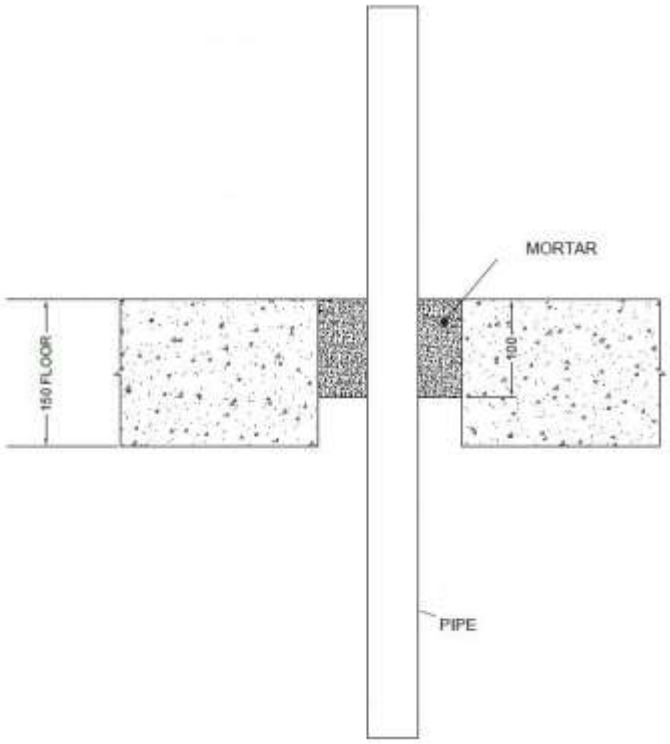
* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
wall thickness

A.2.8 Pipe penetration seal with 100 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: Plastic pipes fitted at any position within the aperture (min. separation 80 mm from seal edges and 100 mm from other services), with 100 mm JOINTS FIRE COMPOUND PRO+ to the top surface of the floor. JOINTS FIRE WRAP PRO+ are required to be fitted to the bottom of the seal, as indicated below.

Construction details:



A.2.8.1 Single side penetration seal with pipes

Services	Wrap	Maximum aperture	Classification
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1*			
110 mm diameter / 3 mm wall	50 x 3.6 mm	200 x 200 mm	**EI 240 C/C**
110 mm diameter / 3 mm wall	50 x 3.6 mm	2400 x 1200 mm	**EI 180 C/C**
160 mm diameter / 4.0 mm wall	75 x 6 mm	2400 x 1200 mm	**EI 180 C/C**
160 mm diameter / 4.0 mm wall	75 x 8 mm	300 x 300 mm	**EI 240 C/C**
160 mm diameter / 4.0 mm wall	75 x 8 mm	2400 x 1200 mm	**EI 180 C/C**
110 mm diameter / 3.4 mm wall	75 x 2 mm	2400 x 1200 mm	**EI 180 C/C**
110 mm diameter / 3 mm wall	50 x 5.4 mm	300 x 300 mm	**EI 240 C/C**
110 mm diameter / 3 mm wall	50 x 5.4 mm	2400 x 1200 mm	**EI 180 C/C**
125 mm diameter / 3.5 mm wall	50 x 7.2 mm	300 x 300 mm	**EI 240 C/C**
125 mm diameter / 3.5 mm wall	50 x 7.2 mm	2400 x 1200 mm	**EI 180 C/C**
160 mm diameter / 4.5 mm wall	50 x 10.8 mm	300 x 300 mm	**EI 240 C/C**
160 mm diameter / 4.5 mm wall	50 x 10.8 mm	2400 x 1200 mm	**EI 180 C/C**
PP pipe according to EN 1451-1			
40 mm diameter /3 mm wall	None	2400 x 1200 mm	**EI 120 C/C**
50 mm diameter / 2.5 mm wall	50 x 3.6 mm	300 x 300 mm	**EI 240 C/C**
50 mm diameter / 2.5 mm wall	50 x 3.6 mm	2400 x 1200 mm	**EI 180 C/C**
75 mm diameter / 3.5 mm wall	50 x 3.6 mm	300 x 300 mm	**EI 240 C/C**
75 mm diameter / 3.5 mm wall	50 x 3.6 mm	2400 x 1200 mm	**EI 180 C/C**
PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1^			
125 mm diameter / 4.9 mm wall	75 x 4 mm	300 x 300 mm	**EI 180 C/C, E 240 C/C**
125 mm diameter / 4.9 mm wall	75 x 6 mm	2400 x 1200 mm	**EI 180 C/C**
250 mm diameter / 7.8 mm wall	75 x 14 mm	2400 x 1200 mm	**EI 180 C/C**
160 mm diameter / 6.2 mm wall	75 x 8 mm	2400 x 1200 mm	**EI 180 C/C**

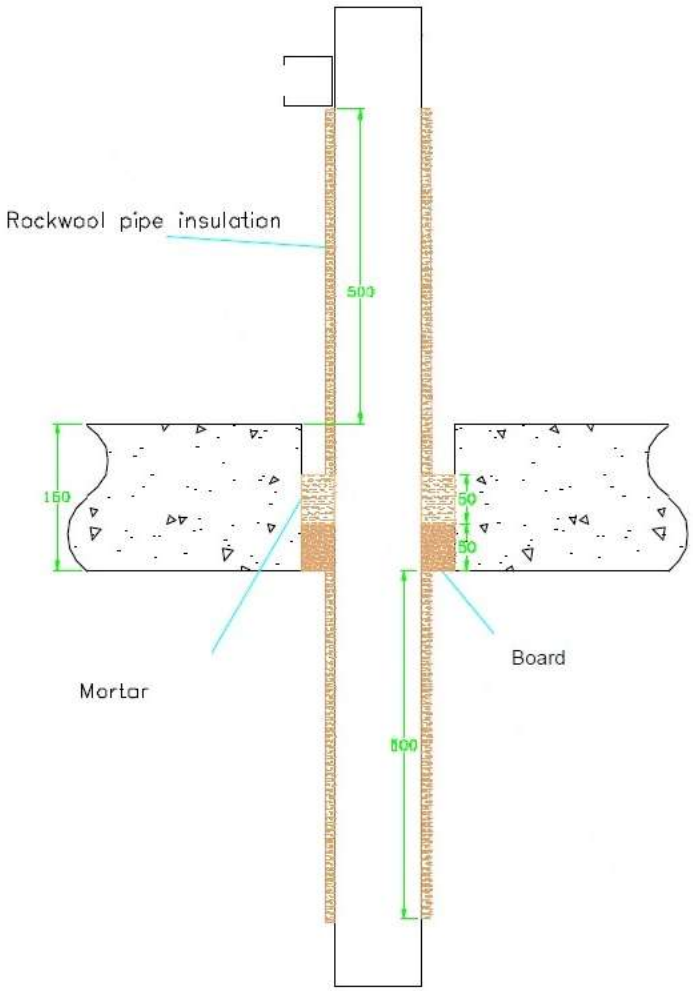
* In Germany the pipes have additionally to comply with DIN 19531-10

^ In Germany the pipes have additionally to comply with DIN 19535-10

A.2.9 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: CI (Continuous Interrupted) or LI (Local Interrupted) insulated composite pipes (single) fitted at any position within the aperture (min. separation 10 mm from seal edges, with 50 mm JOINTS FIRE COMPOUND PRO+ flush with the top of floor, backed with 50 mm stone wool 150 kg/m^3

Construction details:



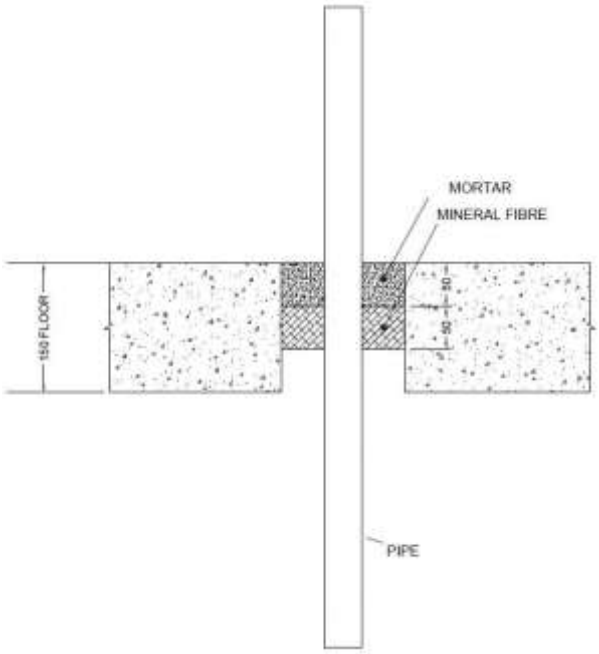
A.2.9.1 Single side penetration seal with pipes

Services Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)	Maximum Aperture	Insulation	Classification
16 mm diameter/2.25 mm wall	135 x 135 mm	500 mm long, minimum 20 mm Stone wool insulation minimum 80 kg/m^3	**EI 240 C/C**
16 mm diameter/2.25 mm wall			**E 240 C/C, EI 180 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			
16 mm diameter/2.25 mm wall	2400 mm x 1200 mm		**EI 180 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			

A.2.10 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+

Penetration Seal: Plastic pipes (single) fitted at any position within the aperture (min. separation 80 mm from seal edges and 100 mm from other services), with 50 mm JOINTS FIRE COMPOUND PRO+ flush with the top of floor, backed with 50 mm stone wool 150 kg/m^3

Construction details:



A.2.10.1 Single side penetration seal with cables

Services	Wrap	Maximum aperture	Classification
40 mm diameter PP pipe according to EN 1451-1 /3 mm wall	None	2400 x 1200 mm	**EI 120 C/C**
40 mm diameter PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1^ /4 mm wall			
110 mm diameter PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1^ HDPE/4.3 mm wall	50 x 2 mm		**EI 60 C/C**

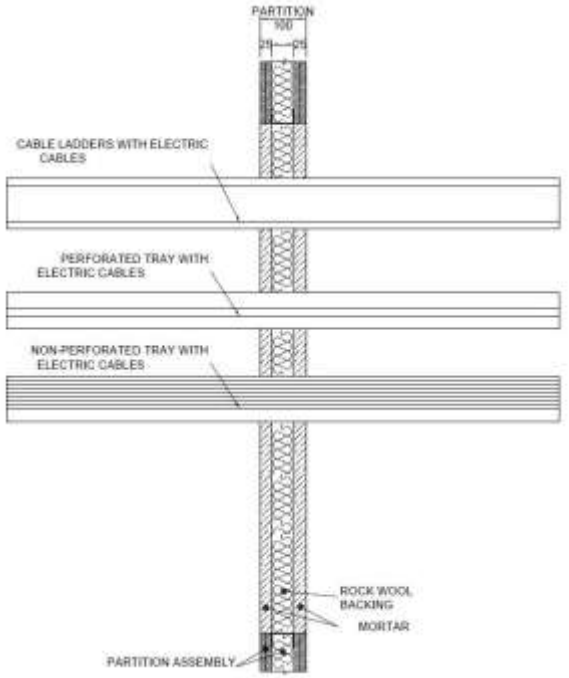
^ In Germany the pipes have additionally to comply with DIN 19535-10

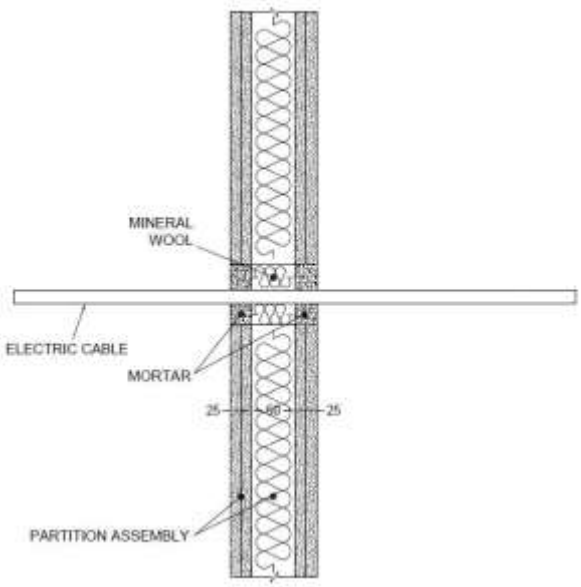
A.3 Flexible wall constructions according to 1.2.1 with wall thickness of minimum 100 mm

A.3.1 Cable penetration seal with 25 mm deep JOINTS FIRE COMPOUND PRO+ to both faces backed with 50 mm mineral fibre board

Penetration Seal: Cables fitted at any position within the aperture (min. separation 25 mm from seal edges), with 25 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall, backed with 50 mm stone wool board 150 kg/m^3.

Construction details:





Note: Insulated metal pipes may also be included within the same seal as cables subject to minimum 100 mm separation. See separate classification for pipes.

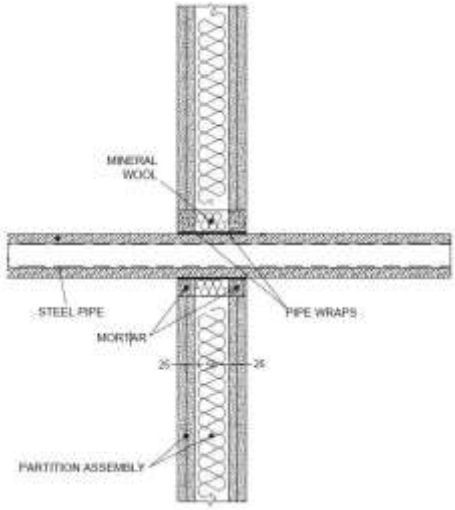
A.3.1.1 Double side penetration seal with cables

Services	Maximum aperture	Classification
None (blank)	2400 mm wide x 1200 mm high	**EI 120**
Single electrical cables up to 21 mm Ø (min.100 separation from other services		**E 120, EI 90**
Electrical cables up to 80 mm Ø (single, bundled and on trays)		**E 120, EI 60**
Telecommunication cables up to 21 mm Ø (single or bundles up to 100 mm Ø)		
Steel cable trays & ladders		
Steel conduit up to 16 mm Ø		**E 120 C/U, EI 60 C/U**
copper conduit up to 16 mm Ø		**E 120 C/U, EI 45 C/U**
Unsheathed wires up to 24 mm Ø		**E 120, EI 45**
PVC conduit up to 16 mm Ø		**EI 120 C/U, EI 120 C/C**

A.3.2 Pipe penetration seal with 25 mm deep JOINTS FIRE COMPOUND PRO+ to both faces backed with 50 mm mineral fibre board

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges), with 25 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall, backed with 50 mm stone wool board 150 kg/m^3 or 50 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall without backing*. JOINTS FIRE WRAP PRO+ are required to be fitted to both faces of the seal.

Construction details:

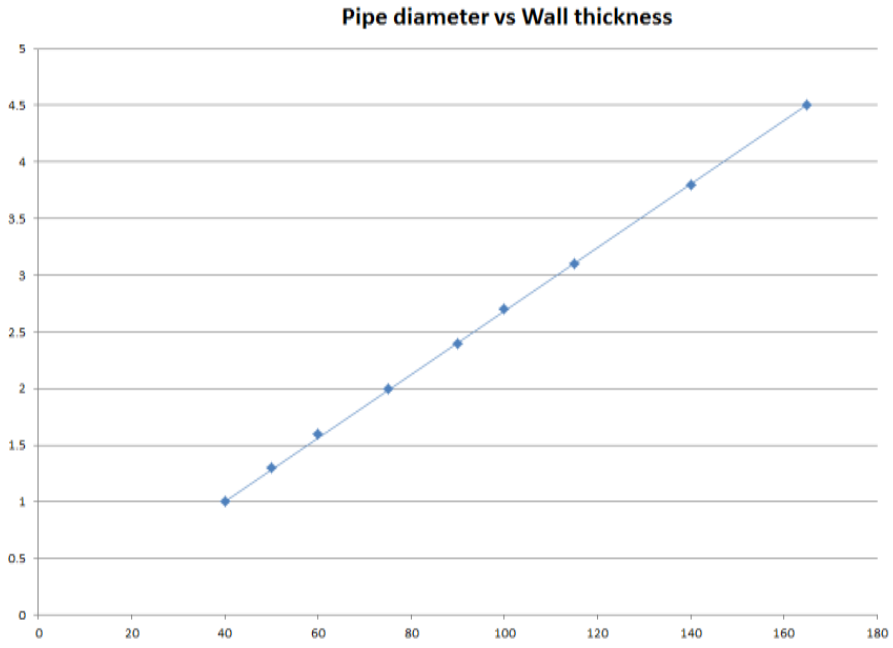


* Maximum seal size of 2400 mm wide x 1200 mm high

A.3.2.1 Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/1-14.2 mm wall	2 off 50 x 1.8 mm JOINTS FIRE WRAP PRO+, one fitted flush to each face of seal	13 mm Kaiflex ST insulation	**EI 120 C/U**
40 mm diameter/1-14.2 mm wall*	2 off 50 x 3.6 mm JOINTS FIRE WRAP PRO+, one fitted flush to each face of seal		**E 120 C/U, EI 60 C/U**
50 mm diameter/1.3-14.2 mm wall*			
60 mm diameter/1.6-14.2 mm wall*			
75 mm diameter/2-14.2 mm wall*			
90 mm diameter/2.4-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3.1-14.2 mm wall*			
140 mm diameter/3.8-14.2 mm wall*			
165 mm diameter/ 4.5-14.2 mm wall*			

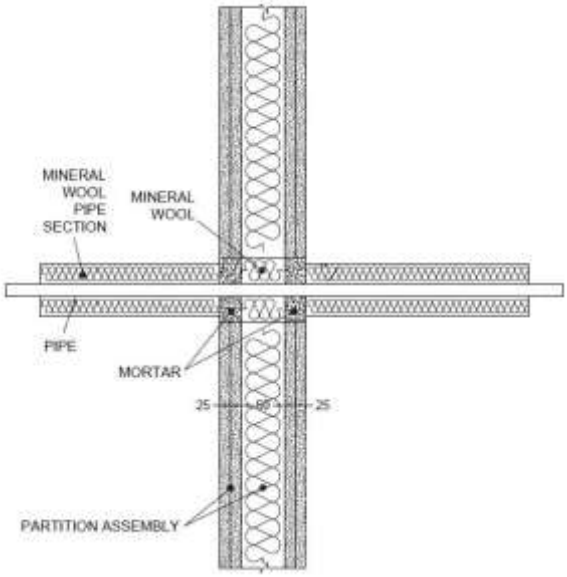
* Typical pipe diameters shown, see below graph for intermediate sizes



A.3.3 Pipe penetration seal with 25 mm deep JOINTS FIRE COMPOUND PRO+ to both faces backed with 50 mm mineral fibre board

Penetration Seal: 500 mm (min.)* LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic (and composite) pipes (single) fitted at any position within the aperture (min. separation 40 mm from seal edges and 100 mm from other services), with 25 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall backed with 50 mm stone wool board 150 kg/m^3. Maximum seal size 2400 mm wide x 1200 mm high

Construction details:



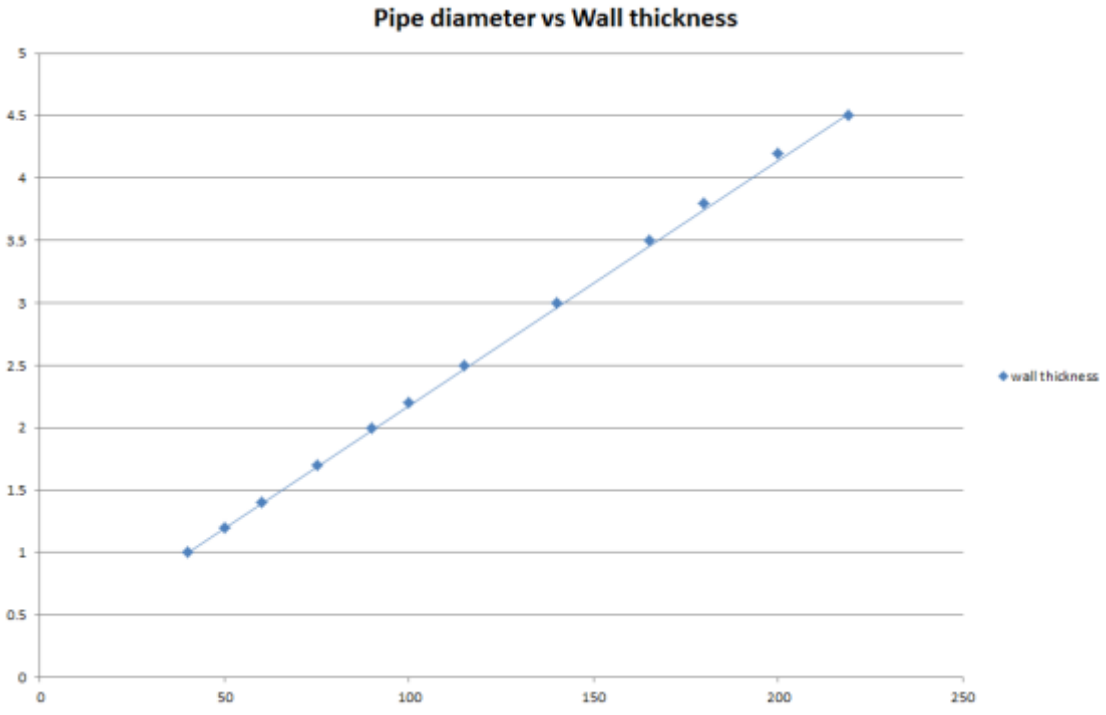
* Minimum 600 mm long insulation required for Alupex pipe.

A.3.3.1 Double side penetration seal with pipes

Services	Insulation	Classification
Copper pipe up to 54 mm diameter/1-14.2 mm wall	20 mm stone wool 80 kg/m^3	**EI 120 C/C**
Alupex composite pipe 75 mm diameter/7.5 mm wall	600 mm length of 25 mm Protecta Mineral Fibre BIO	**EI 60 U/U, EI 60 U/C, EI 60 C/U. EI 60 C/C**

Services	Insulation	Classification
Mild or stainless steel pipe		
40 mm diameter/1-14.2 mm wall	20 mm stone wool 80 kg/m^3	**EI 120 C/U**
40 mm diameter/1-14.2 mm wall*	30 mm stone wool 80 kg/m^3	**E 120 C/U, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*		
60 mm diameter/1.4-14.2 mm wall*		
75 mm diameter/1.7-14.2 mm wall*		
90 mm diameter/2-14.2 mm wall*		
100 mm diameter/2.2-14.2 mm wall*		
115 mm diameter/2.5-14.2 mm wall*		
140 mm diameter/3-14.2 mm wall*		
165 mm diameter/3.5-14.2 mm wall*		
180 mm diameter/3.8-14.2 mm wall*		
200 mm diameter/4.2-14.2 mm wall*		
219 mm diameter/4.5-14.2 mm wall*		

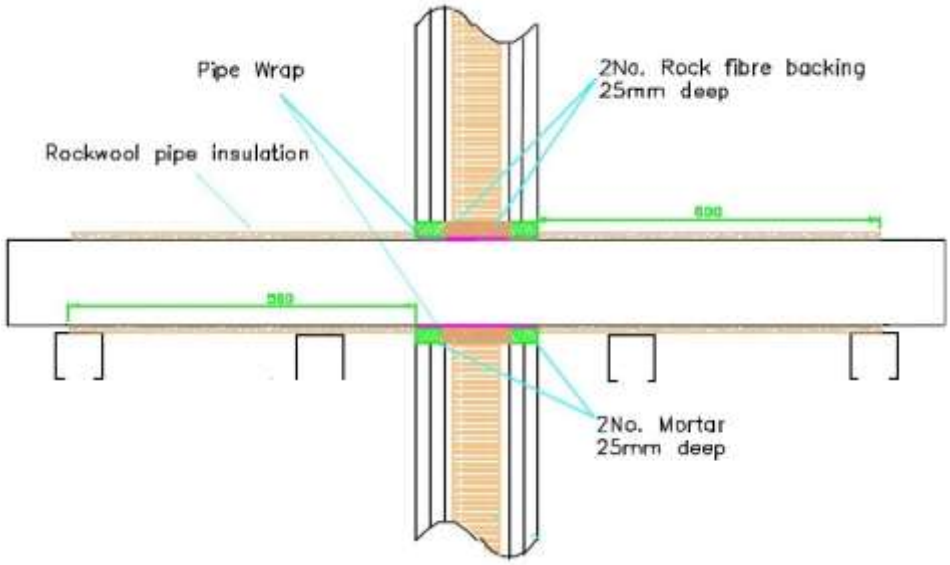
* Typical pipe diameters shown, see below graph for intermediate sizes



A.3.4 Pipe penetration seal with 25 mm deep JOINTS FIRE COMPOUND PRO+ to both faces backed with 50 mm mineral fibre board

Penetration Seal: 500 mm (min.)* LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic (and composite) pipes (single) fitted at any position within the aperture (min. separation 40 mm from seal edges and 100 mm from other services), with 25 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall backed with 50 mm stone wool board 150 kg/m3. Maximum seal size 2400 mm wide x 1200 mm high

Construction details:



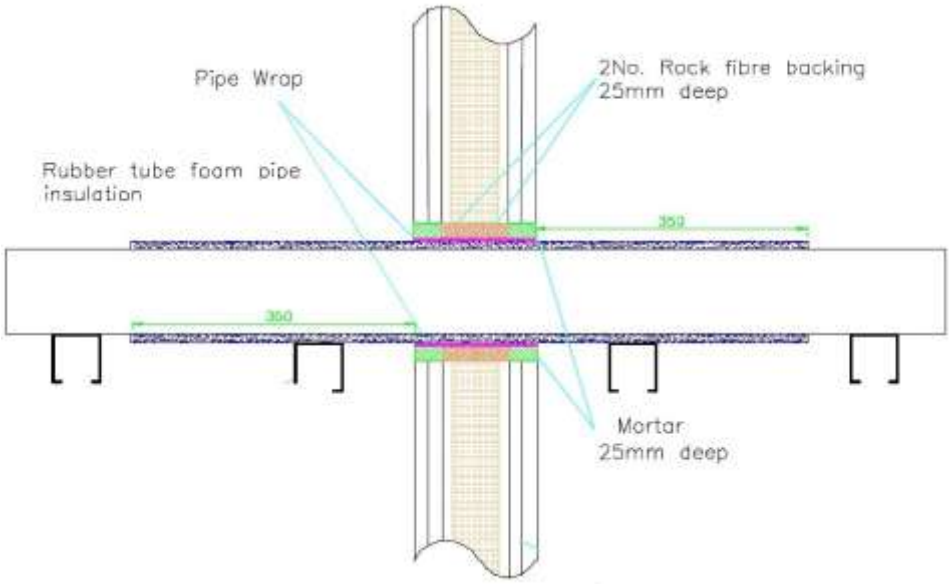
A.3.4.1 Double side penetration seal with pipes

Services	Insulation	Classification
Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD) pipe		
16 mm diameter/2.25 mm wall	Minimum 20 mm stone wool, minimum 80 kg/m^3	**EI 120 C/C**
20 mm diameter/2.5 mm wall		
26 mm diameter/3 mm wall		
32 mm diameter/3 mm wall		
40 mm diameter/3.5 mm wall		
50 mm diameter/4 mm wall		
63 mm diameter/4.5 mm wall		
75 mm diameter/4.7 mm wall		

A.3.5 Pipe penetration seal with 25 mm deep JOINTS FIRE COMPOUND PRO+ to both faces backed with 50 mm mineral fibre board

Penetration Seal: CS (Continuous Sustained) insulated metallic and composite pipes fitted at any position within the aperture (min. separation 25 mm from seal edges), with 25 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall, backed with 25 mm stone wool 150 kg/m^3*. JOINTS FIRE WRAP PRO+ are required to be fitted to both faces of the seal. Maximum seal size 2400 mm wide x 1200 mm long

Construction details:



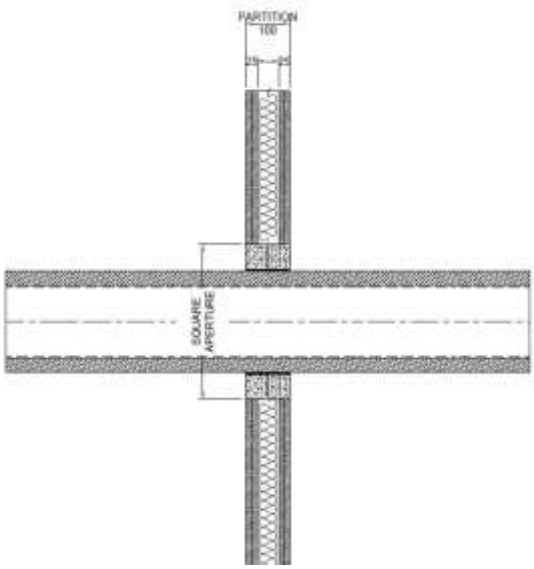
A.3.5.1 Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Copper pipe			
12-54 mm diameter/1-1.2 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to both sides of the seal	9-25 mm Kaiflex ST insulation	**EI 120 C/C**
Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)			
16 mm diameter/2.25 mm wall	50 x 3.6 mm JOINTS FIRE WRAP PRO+ fitted to both sides of the seal	9-25 mm Kaiflex ST insulation	**EI 120 C/C**
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm diameter/3 mm wall			
40 mm diameter/3.5 mm wall			
50 mm diameter/4 mm wall			
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			

A.3.6 Pipe penetration seal with 50 mm deep JOINTS FIRE COMPOUND PRO+ to both faces

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges), 50 mm JOINTS FIRE COMPOUND PRO+ to both sides of the wall without backing*. JOINTS FIRE WRAP PRO+ are required to be fitted to both faces of the seal.

Construction details:

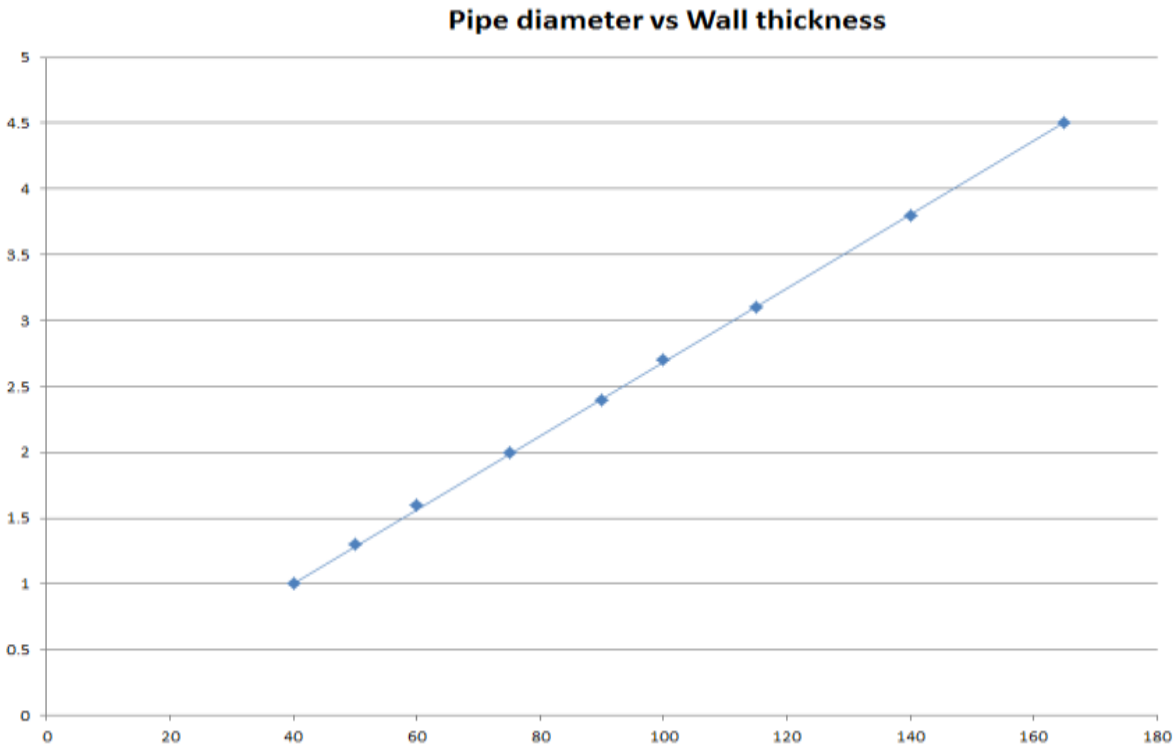


* Maximum seal size of 2400 mm wide x 1200 mm high

A.3.6.1 Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/1-14.2 mm wall*	2 off 50 x 3.6 mm JOINTS FIRE WRAP PRO+, one fitted flush to each face of seal	13 -32 mm Kaiflex ST insulation	**E 120 C/U, EI 60 C/U**
50 mm diameter/1.3-14.2 mm wall*			
60 mm diameter/1.6-14.2 mm wall*			
75 mm diameter/2-14.2 mm wall*			
90 mm diameter/2.4-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3.1-14.2 mm wall*			
140 mm diameter/3.8-14.2 mm wall*			
165 mm diameter/ 4.5-14.2 mm wall*			

* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180