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Member of EOTA
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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment

ETA 22/0734 of 27/04/2023

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:	**UL International (Netherlands) B.V.**
Trade name of the construction product	Protecta FR Service Transit
Product family to which the construction product belongs	Fire Stopping and Sealing Product: • Penetration Seals
Manufacturer	Polyseam Ltd 15. St. Andrews Road Huddersfield, West Yorkshire HD1 6SB, UK www.protecta.co.uk
Manufacturing plant(s)	A/003
This European Technical Assessment contains	37 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	EAD 350454-00-1104, September 2017.

Table of Contents

I. SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

1) Protecta FR Service Transit is a cable & pipe box device used to form penetration seals where cables, plastic pipes, steel pipes and conduits penetrate walls and floors.

2) The Protecta FR Service Transit is supplied with intumescent liner complete within a single, or two part polypropylene or steel casing, to be closed around the services and inserted into the aperture in the supporting element. Services can be inserted through the product and removed after it has been installed.

3) The applicant has submitted a written declaration that the product and/or constituents of the product contains no substances which have been 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.

4) The use category of Protecta FR Service Transit in relation to BWR 3 (Hygiene, health and environment) is IA1, S/W2.

2 Specification of the intended uses of the product in accordance with the applicable European Assessment Document (Hereinafter EAD): EAD 350454-00-1104: 2017

Detailed information and data is given in Annex A.

The intended use of system Protecta FR Service Transit is to reinstate the fire resistance performance of flexible wall, rigid wall and floor constructions, and timber wall and floor constructions, where they are penetrated by services.

1) The specific elements of construction that the system Protecta FR Service Transit may be used to provide a penetration seal in, are as follows:

Flexible walls:	The wall must have a minimum thickness of 75 mm and comprise steel or timber studs* lined on both faces with minimum 1 layer of 12.5 mm thick boards. Flexible wall solutions may also be used in rigid walls, with a minimum density of 350 kg/m^3.
Rigid walls:	The wall must have a minimum thickness of 75 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m^3.
Timber walls:	The wall must have a minimum thickness of 100 mm and comprise solid wood or cross-laminated timber
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.
Timber floors:	The floor must have a minimum thickness of 150 mm and comprise solid wood or cross-laminated timber.

* no part of the penetration seal may 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 class A1 or A2 according to EN 13501-1 must be provided within the cavity between the penetration seal and the stud.

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

2) The system Protecta FR Service Transit may be used to provide a penetration seal with specific supporting constructions and substrates (for details see Annex A).

3) Where PVC pipes are mentioned in Annex A, this includes PVC-U, PVC-C and similar if the pipe is according to EN 1329-1, EN 1452-2, EN 1453-1^ and EN 1566-1. Where PP pipes are mentioned in Annex A, this includes PP-MV, PP-H, PP-R and similar if the pipe is according to EN 1451-1 or DIN 8077/8078. Where PE pipes are mentioned, this includes PE-LD, PE-MD, PE-HD, PE-X and similar according to EN 1519-1, EN 12201-2 or EN 12666-1.

4) The provisions made in this European Technical Assessment are based on an assumed working life of the Protecta FR Service Transit of 25 years, provided that the conditions laid down in the manufacturers datasheet and instructions 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.

5) Type Z_2: intended for use at internal conditions with humidity classes other than Z_1, excluding temperatures below 0°C.

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

Product-type: Pipe Service Transit		Intended use: Penetration Seal
Basic requirement for construction work	Basic Requirement	Performance
BWR 2 Safety in case of fire		
EN 13501-1	Reaction to fire	Performance not assessed
EN 13501-2	Resistance to fire	Annex A
BWR 3 Hygiene, health and environment		
EN 1026	Air permeability	Annex B
EAD 350454-00-1104, Annex C	Water permeability	No performance determined
Declaration of manufacturer & EN 16516	Content, emission and/or release of dangerous substances	Use categories: IA1, S/W2 Declaration of manufacturer
BWR 4 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
EAD 350454-00-1104, Clause 2.2.9	Durability	Z_2
BWR 5 Protection against noise		
EN 10140-1,2,4,5/ EN ISO 717-1	Airborne sound insulation	No performance determined
BWR 6 Energy economy and heat retention		
EN 12664, EN 12667, EN 12939, EN ISO 8990, EN ISO 6946, EN ISO 14683, EN ISO 10211, EN ISO 10456	Thermal properties	No performance determined
EN ISO 12572, EN 12086, EN ISO 10456	Water vapour permeability	No performance determined

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 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 https://eur-lex.europa.eu/oj/direct-access.html) of the European Commission , 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 7th February 2023 relating to the European Technical Assessment ETA 22/0734 issued on 27/04/2023 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 (Netherlands) B.V.

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

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 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 penetration seal
- Construction of the 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. pipe trays)

(b) Installation instruction:

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

6 Issued on:

27th April 2023

Report by:	Verified by:	Validated by:
D. Yates	C. Johnson	Erik Teubler
Staff Engineer	Senior Staff Engineer	Head of TAB
Built Environment	Built Environment	Built Environment

For and on behalf of UL International (Netherlands) B.V.

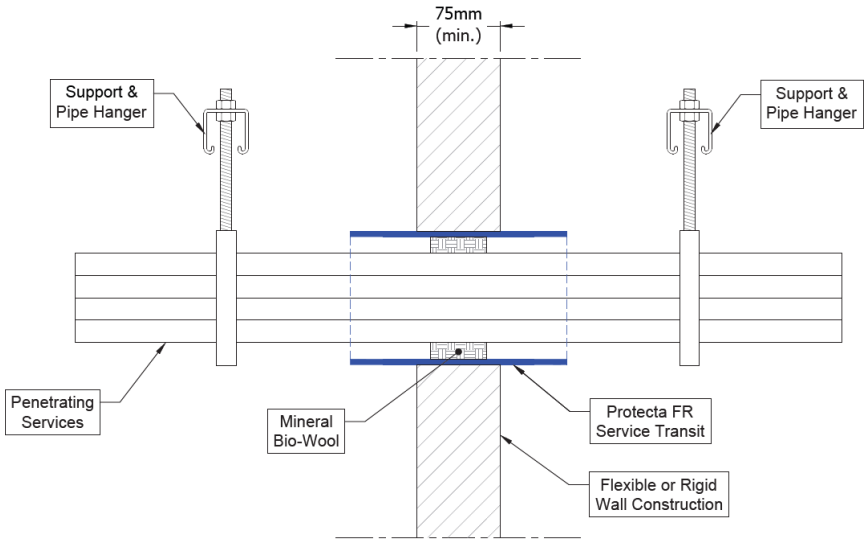
ANNEX A – Resistance to Fire Classification – Protecta FR Service Transit

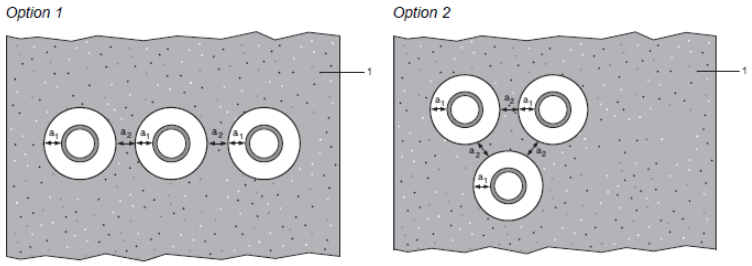
A.1 Flexible or rigid wall constructions with wall thickness of minimum 75 mm

A.1.1 Penetration seals, in drywalls (min. 1 x 12.5 mm board per side) and concrete/masonry walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 150 mm long Protecta FR Service Transit, central within the wall. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Separation between transit and supporting construction (a1) = 0 mm.

Construction details:





Key

1	Supporting construction
a_1	Pipe / edge of seal separation (annular space)
a_2	Separation between penetration seals

Figure E.2 — Standard configuration for single pipe penetration seals

A.1.1.1

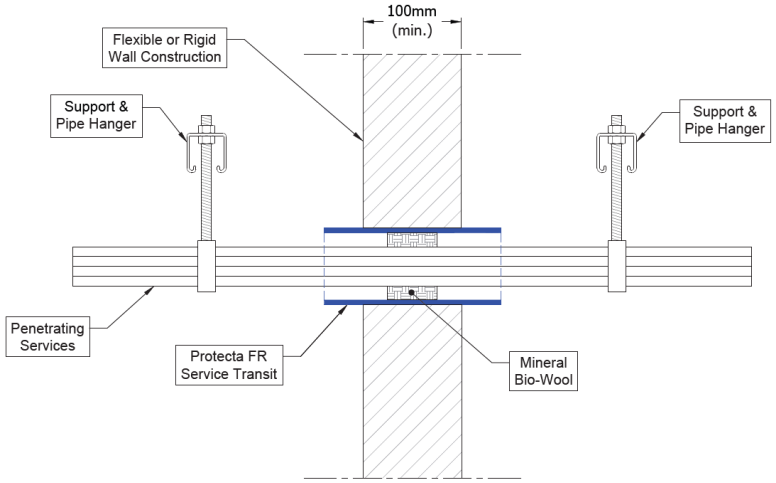
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 150 mm long	40 mm Ø x 150 mm long	**EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 150 mm long	63 mm Ø x 150 mm long	
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 150 mm long	90 mm Ø x 150 mm long	
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 150 mm long	110 mm Ø x 150 mm long	
Up to 100 mm diameter bundle of cables up to 80 mm diameter	All inlay sizes specified above	All transit sizes specified above	**E 60** **EI 45**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool			**E 60** **EI 30**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 14 mm diameter			**EI 60 U/C**

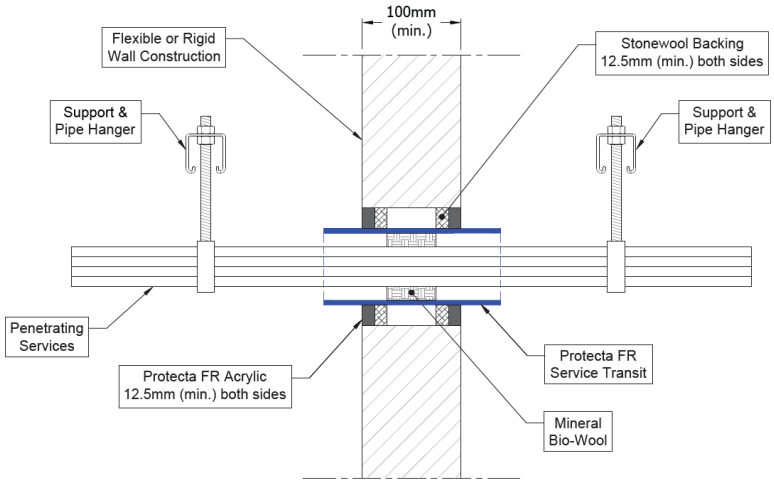
A.2 Flexible or rigid wall constructions with wall thickness of minimum 100 mm

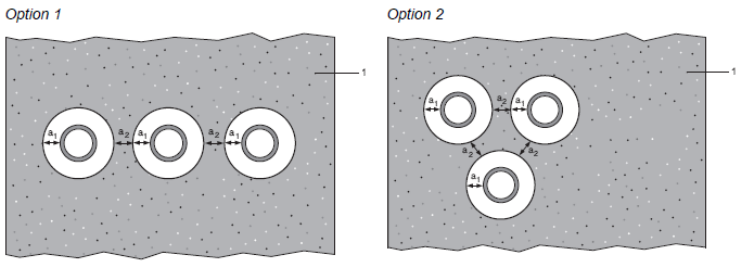
A.2.1 Penetration seals, in drywalls (min. 2 x 12.5 mm board per side) and concrete/masonry walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit, central within the wall. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Separation between transit and supporting construction (a1) = 0 mm A.2.1.1 and minimum 10 mm with maximum aperture 300 x 300mm A.2.1.2.

Construction details:







Key

1 Supporting construction
a_1 Pipe / edge of seal separation (annular space)
a_2 Separation between penetration seals

Figure E.2 — Standard configuration for single pipe penetration seals

A.2.1.1 FR Service transit friction fitted into wall

Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 90**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 90**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 90**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 90**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 90** **EI 60**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 90 U/C**

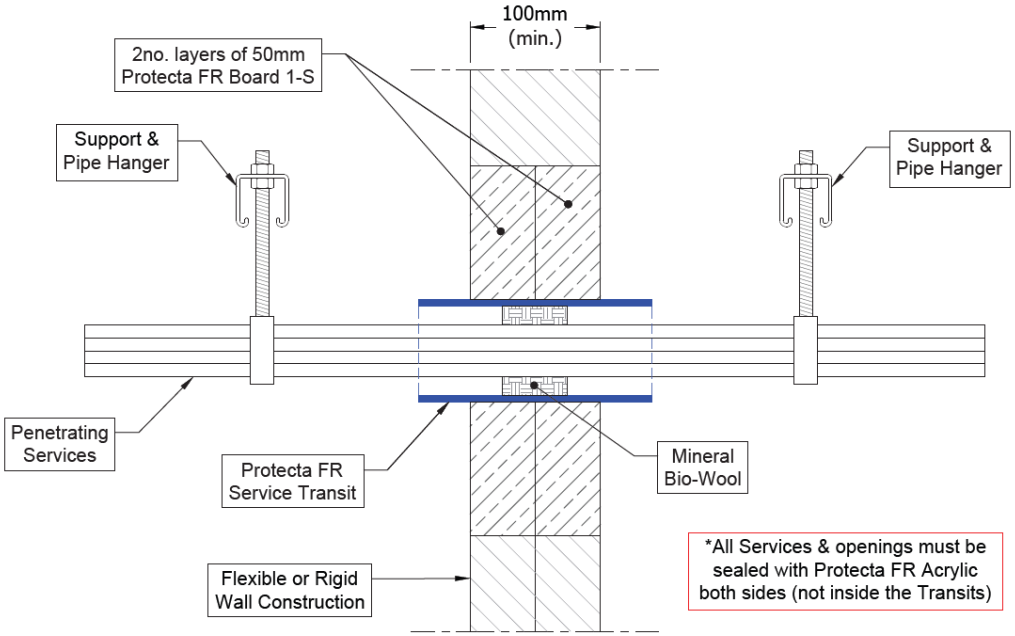
A.2.1.2 FR Service Transit in minimum 20 mm oversize aperture fitted with Protecta FR Acrylic.

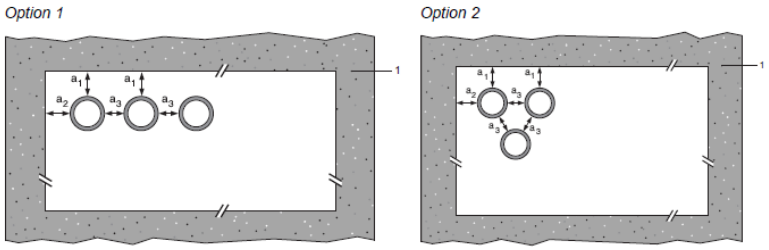
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 90**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 90**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 90**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 90**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**EI 90**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 90 U/C**

A.2.2 Penetration seals, in 100 mm thick Protecta FR Board 1-S seals in drywalls (min. 2 x 12.5 mm board per side) and concrete/masonry walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit, central within the seal. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between transits and between transits and the edges of the board seal (a1, a2, a3) = 30 mm, min.

Construction details:





Key

1	Supporting construction
a_1	Pipe / top edge of seal separation
a_2	Pipe / side edge of seal separation
a_3	Pipe / pipe separation

Figure E.1 — Standard configuration for multiple pipe penetration seals

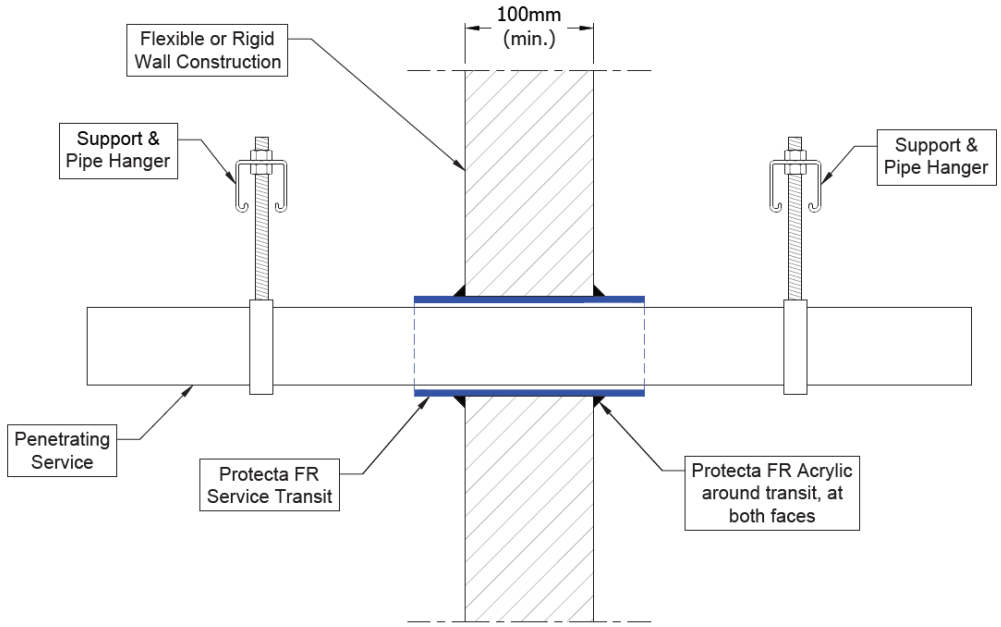
A.2.2.1

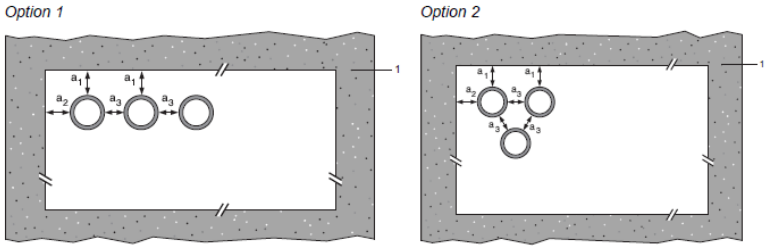
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 90**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 90**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 90**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 90**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 90** **EI 60**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 90 U/C**

A.2.3 Penetration seals, in drywalls (min. 2 x 12.5 mm board per side) and concrete/masonry walls

Penetration Seal: Plastic rectangular services fitted with minimum 250 mm long Protecta FR Service Transit, central within the wall. Min. separation between seals (a2) = 30 mm, separation between transit and supporting construction (a1) = 0 mm. Transit fitted in walls with beads of Protecta FR Acrylic between the transit and the supporting construction.

Construction details:





Key

1	Supporting construction
a_1	Pipe / top edge of seal separation
a_2	Pipe / side edge of seal separation
a_3	Pipe / pipe separation

Figure E.1 — Standard configuration for multiple pipe penetration seals

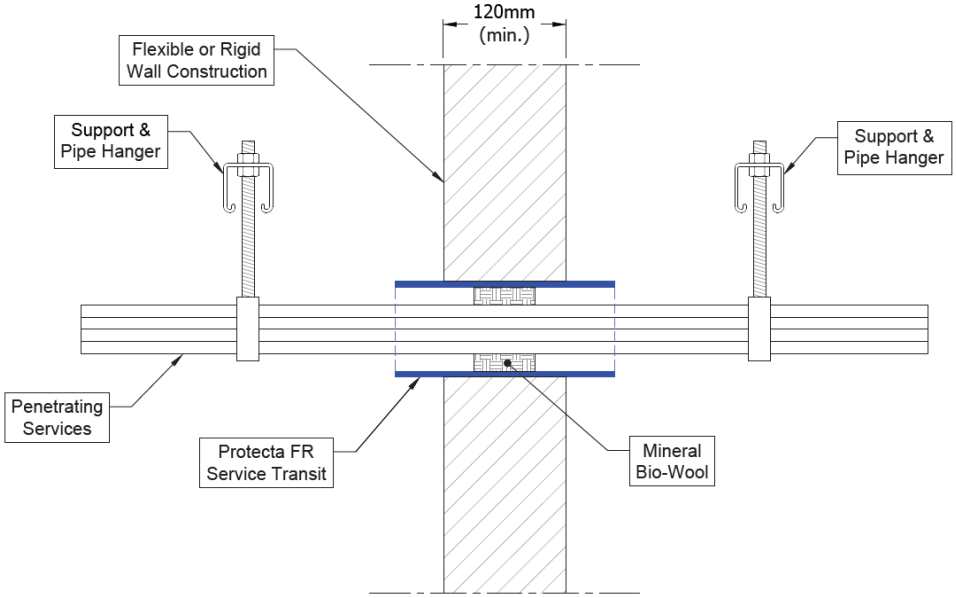
Services	Inlay size	Casing	Transit size	Classification
110 x 54 x 2mm PVC	4.0 mm thick by 250 mm long	100 mm long steel at each end of the transit	126 x 68 x 250 mm long	**EI 120 U/U**
220 x 90 x 2mm PVC	6.0 mm thick by 250 mm long		240 x 108 x 250 mm long	

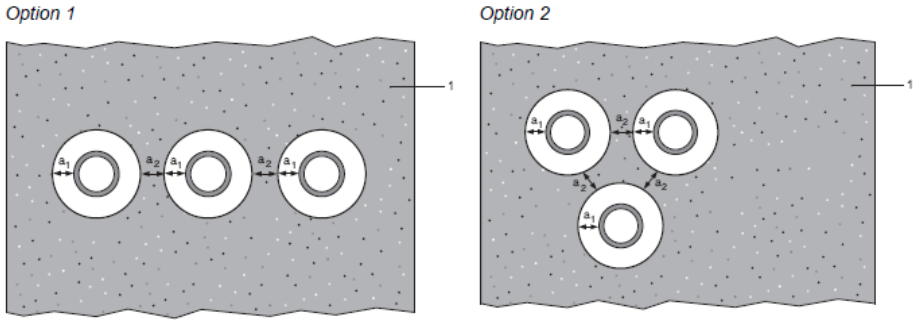
A.3 Flexible or rigid wall constructions with wall thickness of minimum 120 mm

A.3.1 Penetration seals, in drywalls (min. 2 x 15 mm board per side) and concrete/masonry walls

Penetration Seal: Cables fitted with minimum 250 mm long Protecta FR Service Transit, central within the wall. Spaces around cables within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Separation between transit and supporting construction (a1) = 0 mm.

Construction details:





Key

1	Supporting construction
a_1	Pipe / edge of seal separation (annular space)
a_2	Separation between penetration seals

Figure E.2 — Standard configuration for single pipe penetration seals

A.3.1.1 FR Service transit friction fitted into wall

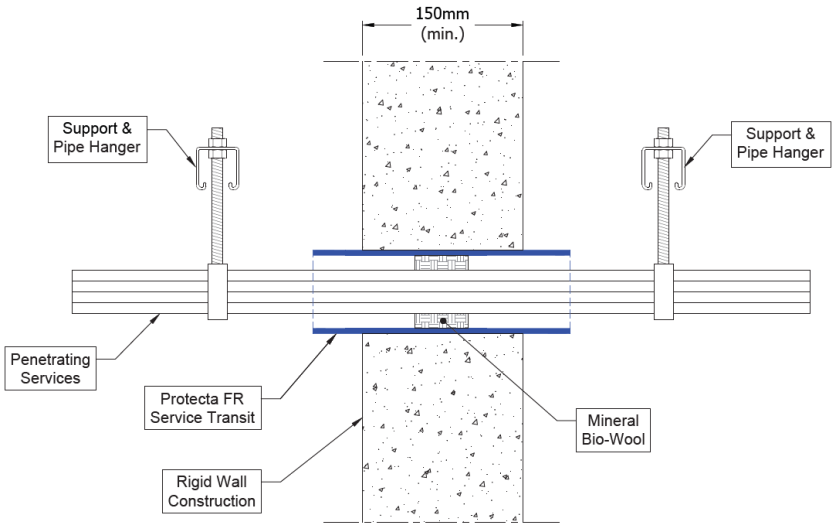
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 120**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 120** **EI 90**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 120**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 120** **EI 90**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 120**
Up to 80 mm diameter bundle of cables up to 50 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 120** **EI 90**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 120**
Up to 100 mm diameter bundle of cables up to 50 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 120** **EI 90**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 120** **EI 90**

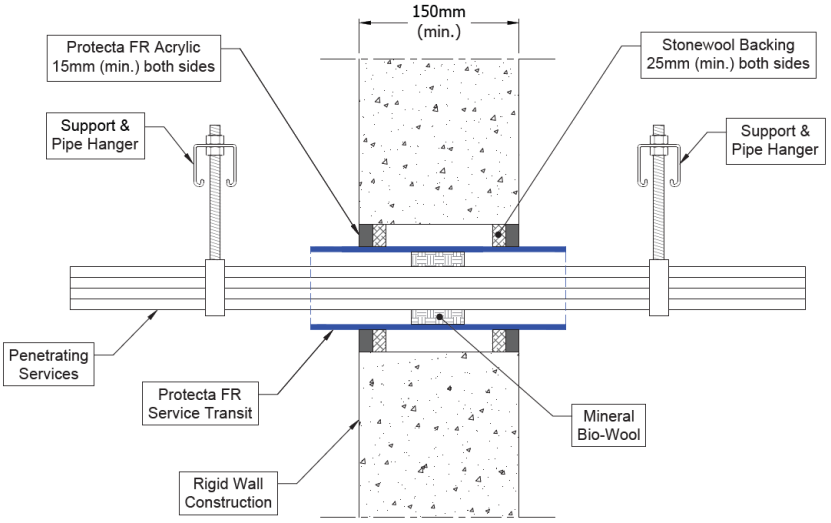
A.4 Rigid walls constructions with wall thickness of minimum 150 mm

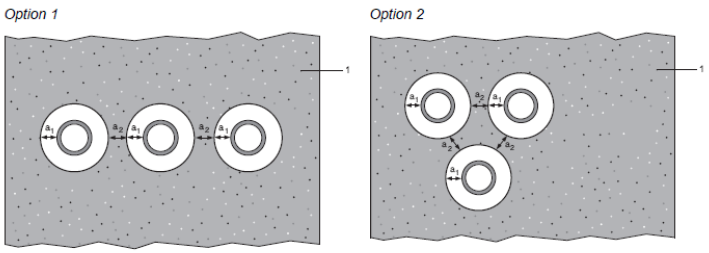
A.4.1 Penetration seals in concrete/masonry walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit, central within the wall. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Separation between transit and supporting construction (a1) = 0 mm A.4.1.1 and minimum 10 mm with maximum aperture 300 x 300mm A.4.1.2.

Construction details:







Key

1	Supporting construction
a_1	Pipe / edge of seal separation (annular space)
a_2	Separation between penetration seals

Figure E.2 — Standard configuration for single pipe penetration seals

A.4.1.1 FR Service Transit friction fitted into wall

Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 240**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 240** **EI 180**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 240** **EI 180**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 240 U/C**

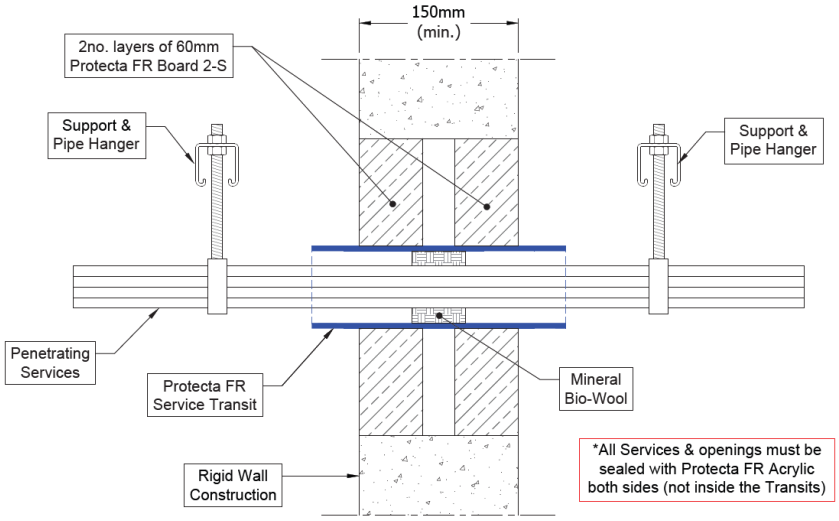
A.4.1.2 FR Service Transit in minimum 20 mm oversize aperture fitted with Protecta FR Acrylic.

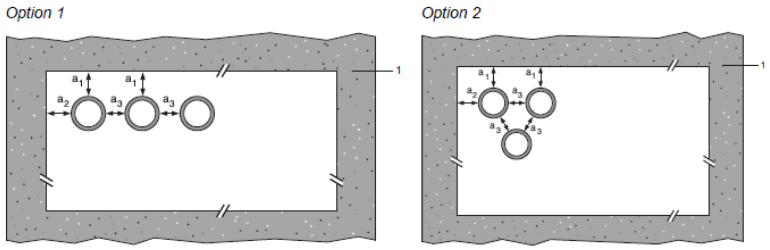
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 240**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 240** **EI 180**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**EI 240**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 240 U/C**

A.4.2 Penetration seals, in 150 mm thick Protecta FR Board 2-S seals (including 30 mm air gap) in concrete/masonry walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit, central within the seal. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between transits and between transits and the edges of the board seal (a1, a2, a3) = 30 mm, min.

Construction details:





Key

1	Supporting construction
a_1	Pipe / top edge of seal separation
a_2	Pipe / side edge of seal separation
a_3	Pipe / pipe separation

Figure E.1 — Standard configuration for multiple pipe penetration seals

A.4.2.1

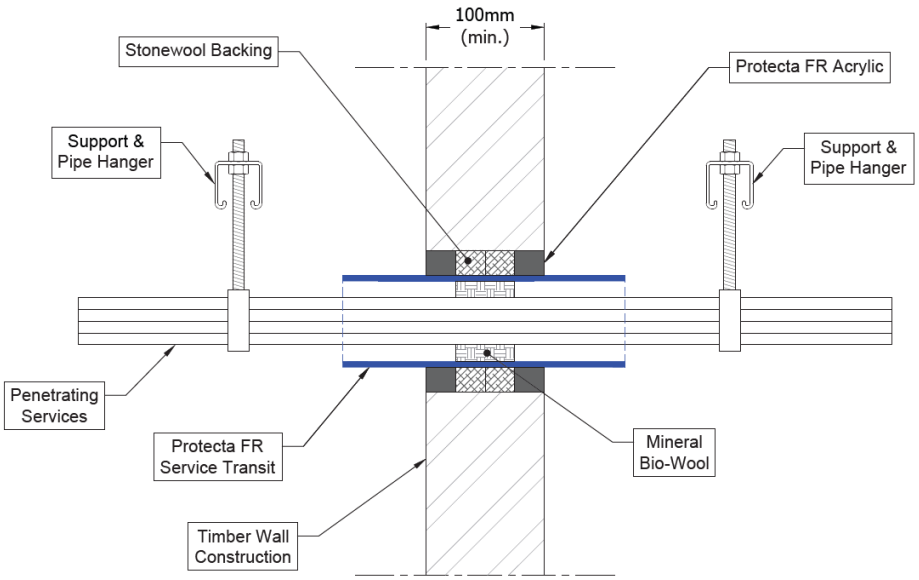
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 240 EI 180**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 180 EI 120**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 240 EI 120**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 240 EI 180**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 90 U/C**

A.5 Timber wall constructions with wall thickness of minimum 100 mm

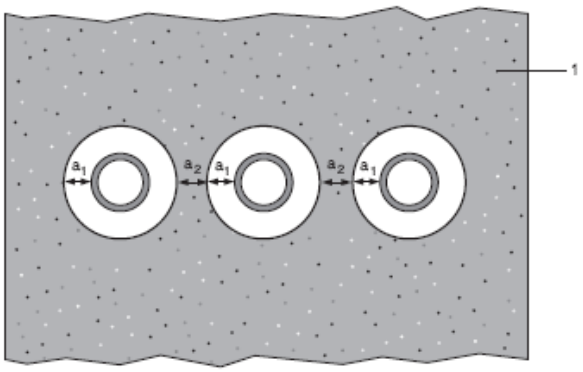
A.5.1 Penetration seals in timber walls

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit central within the wall. The annular space around the Service Transit is sealed with Protecta FR Acrylic, minimum 25 mm deep to both sides of the wall backed with Stonewool (minimum 33kg/m^3 density), minimum 25 mm deep. Spaces around services within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Minimum separation between transit and supporting construction (a1) = 10 mm. Maximum aperture size is Ø 180mm.

Construction details:



Configuration 1:



Key
1 Supporting construction
a1 Pipe / edge of seal separation (annular space)
a2 Separation between penetration seals

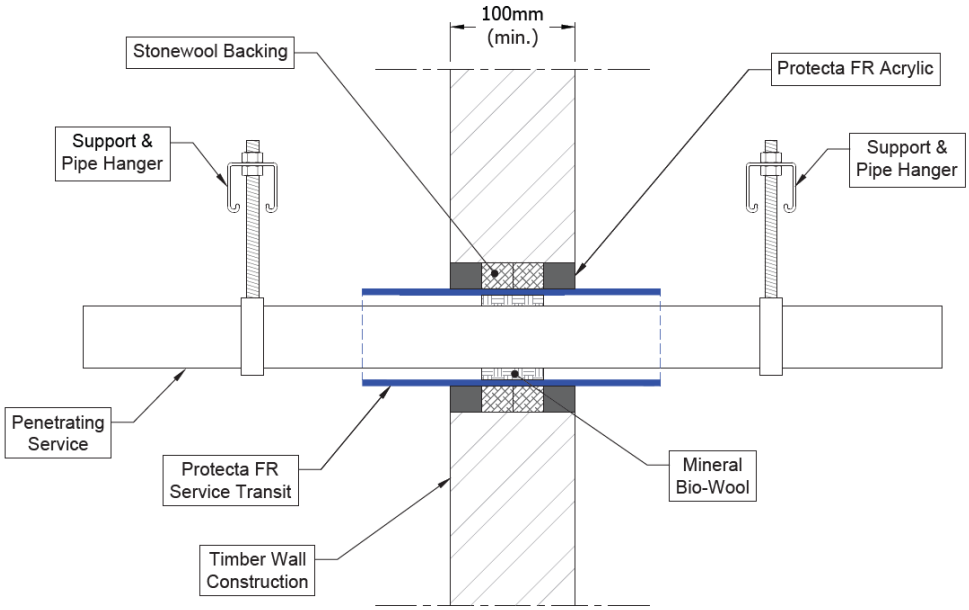
A.5.1.1

Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 90**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 90**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 90**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 90**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**EI 90**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**EI 90 U/C**

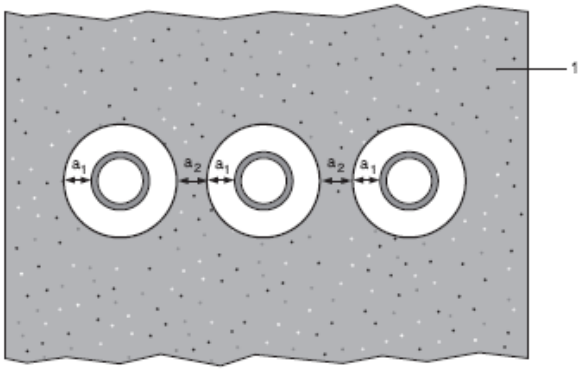
A.5.2 Penetration seals in timber walls

Penetration Seal: Plastic rectangular services with minimum 250 mm long Protecta FR Service Transit central within the wall. The annular space around the Service Transit is sealed with Protecta FR Acrylic, minimum 25 mm deep to both sides of the wall backed with stonewool (minimum 33kg/m^3 density), minimum 25 mm deep. Min. Separation between seals (a2) = 30 mm, min. Minimum separation between transit and supporting construction (a1) = 10 mm. Maximum aperture size is Ø 180mm.

Construction details:



Configuration 1:



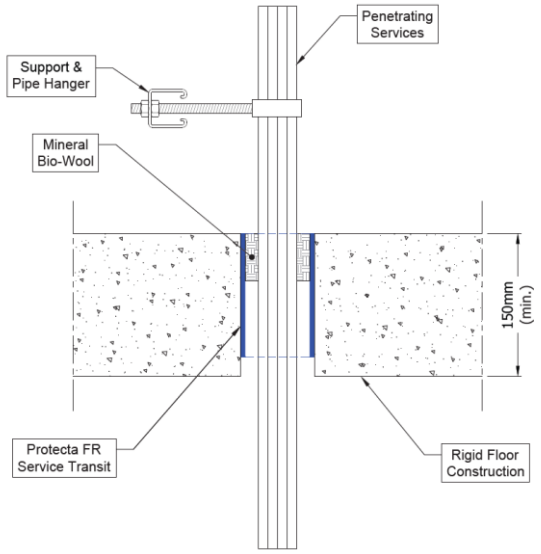
Services	Inlay size	Casing	Transit size	Classification
110 x 54 x 2mm PVC	4.0 mm thick by 250 mm long	100 mm long steel at each end of the transit	126 x 68 x 250 mm long	**EI 90 U/U**
220 x 90 x 2mm PVC	6.0 mm thick by 250 mm long		240 x 108 x 250 mm long	

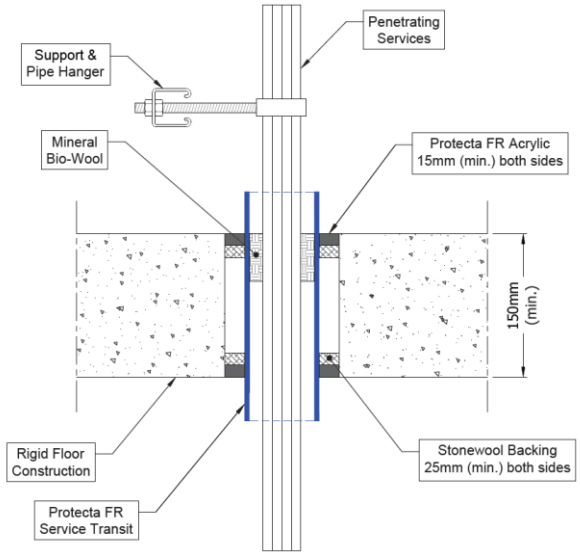
A.6 Rigid floor constructions with thickness of minimum 150 mm

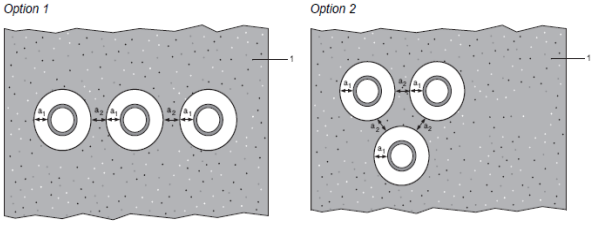
A.6.1 Penetration seals in concrete/masonry floors

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit, central within the floor, or 130 - 150 mm long, top side within the floor. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed top side. Min. Separation between seals (a2) = 30 mm, min. Separation between transit and supporting construction (a1) = 0 mm A.5.1.1 and minimum 10 mm with maximum aperture 300 x 300mm A.5.1.2.

Construction details:







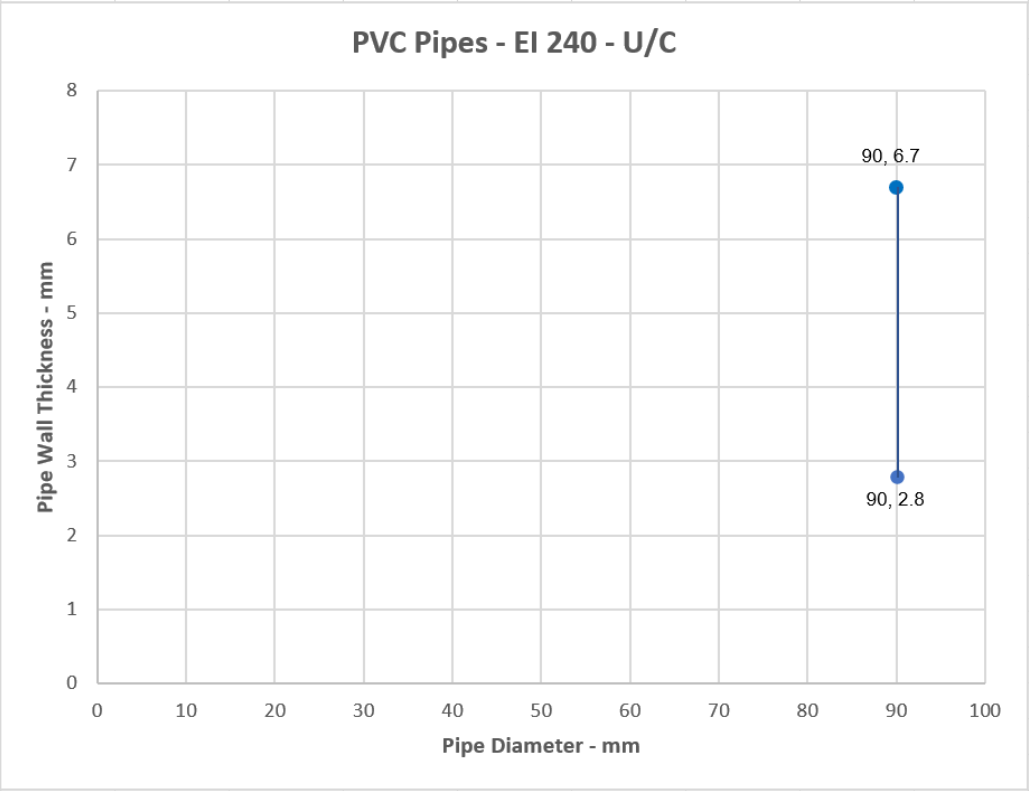
Key

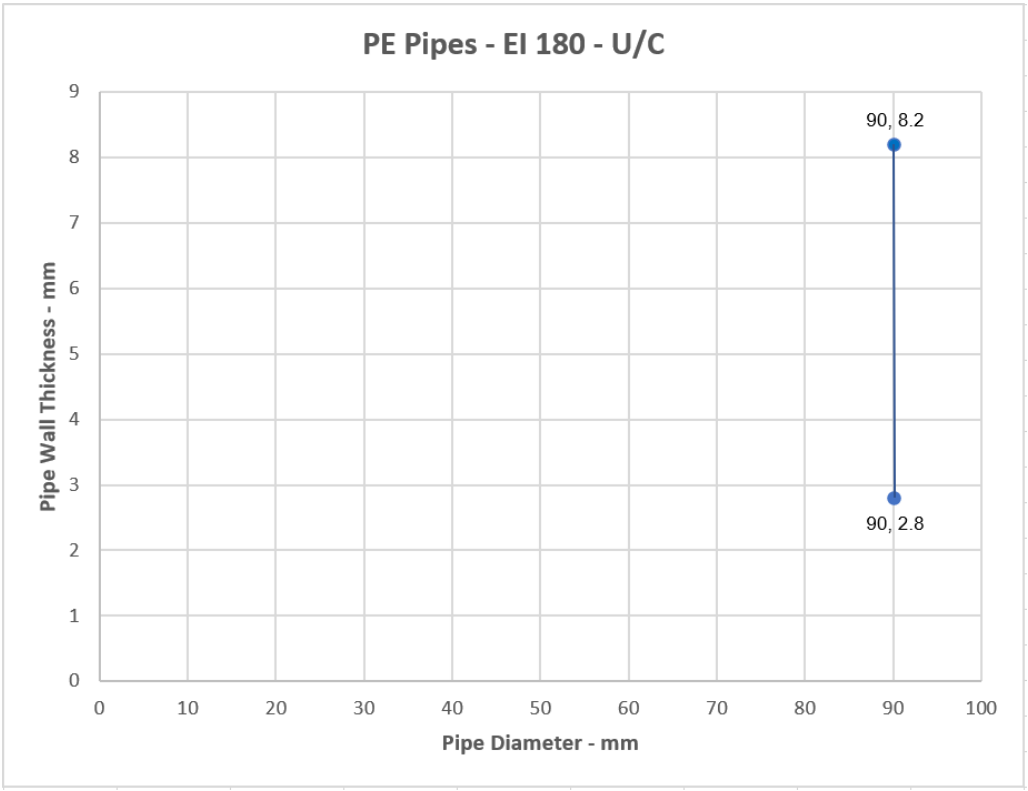
1 Supporting construction
a_1 Pipe / edge of seal separation (annular space)
a_2 Separation between penetration seals

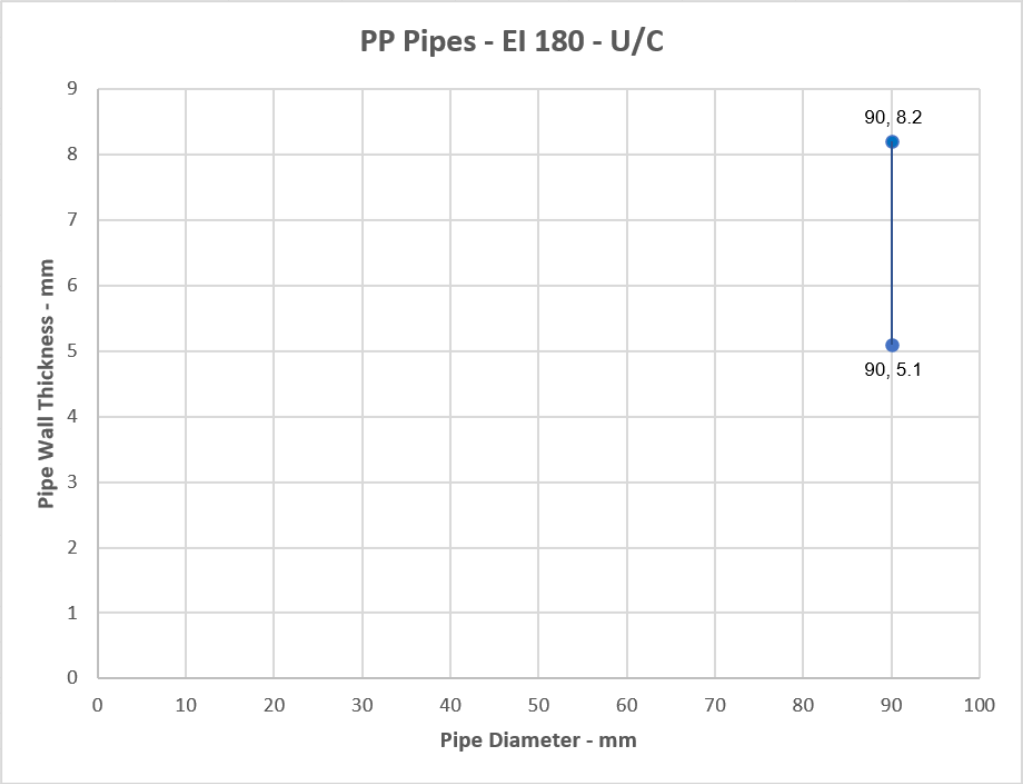
Figure E.2 — Standard configuration for single pipe penetration seals

A.6.1.1 FR Service transit friction fitted into floor

Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 180**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 28 mm diameter steel pipe with minimum 1.0 mm wall thickness	1.5 mm thick by 130 mm long	40 mm Ø x 130 mm long	**EI 240 C/U**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 180**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 180**
Up to 80 mm diameter bundle of cables up to 50 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 180**
Up to 100 mm diameter bundle of cables up to 50 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	6.0 mm thick by 130 mm long	110 mm Ø x 130 mm long	**EI 180**
Up to 90 mm diameter PVC pipe with wall thickness 2.8 – 6.7 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 240 U/C**
Up to 90 mm diameter PE pipe with wall thickness 2.8 – 8.2 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 180 U/C**
Up to 90 mm diameter PP pipe with wall thickness 5.1 – 8.2 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 180 U/C**
Empty filled at top-side with 50 mm deep plug of Mineral Bio Wool	6.0 mm thick by 130 mm long	110 mm Ø x 130 mm long	**EI 240**
	All inlay sizes specified above	All transit sizes specified above	**E 240** **EI 180**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**E 120 C/U** **EI 60 C/U**
	6.0 mm thick by 130 mm long	110 mm Ø x 130 mm long	**EI 240 U/C**


PVC Pipes - EI 240 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 6.7
90, 2.8
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
60
70
80
90
100


PE Pipes - EI 180 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 8.2
90, 2.8
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
80
90
100


PP Pipes - EI 180 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 8.2
90, 5.1
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
80
90
100

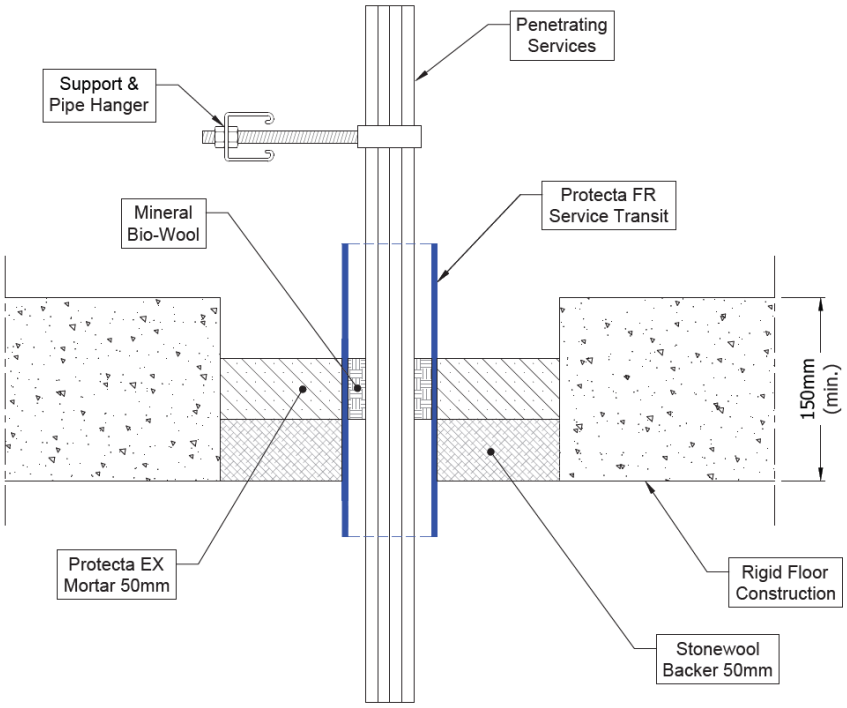
A.6.1.2 FR Service Transit in minimum 20 mm oversize aperture fitted with Protecta FR Acrylic.

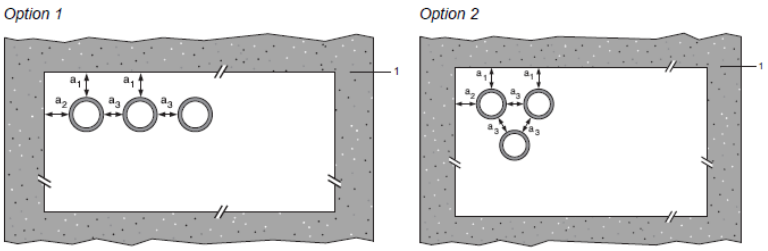
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 14 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 240**
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 240** **EI 180**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 240** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 240** **EI 180**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 240** **EI 60**
Up to 80 mm diameter bundle of cables up to 14 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 240**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 240** **EI 180**
Up to 80 mm diameter bundle of cables up to 50 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 240** **EI 60**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 180**
Up to 100 mm diameter bundle of cables up to 50 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 240** **EI 180**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**E 120 C/U** **EI 60 C/U**
	6.0 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 180 C/U**

A.6.2 Penetration seals, in 50 mm thick Protecta EX Mortar seals (with 50 mm stone wool backer) in concrete/masonry floors

Penetration Seal: Cables, pipes and conduits fitted with 250 mm long Protecta FR Service Transit, central within the seal. Spaces around cables, pipes and conduits within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between transits and between transits and the edges of the board seal (a1, a2, a3) = 30 mm, min.

Construction details:





Key

1	Supporting construction
a_1	Pipe / top edge of seal separation
a_2	Pipe / side edge of seal separation
a_3	Pipe / pipe separation

Figure E.1 — Standard configuration for multiple pipe penetration seals

A.6.2.1

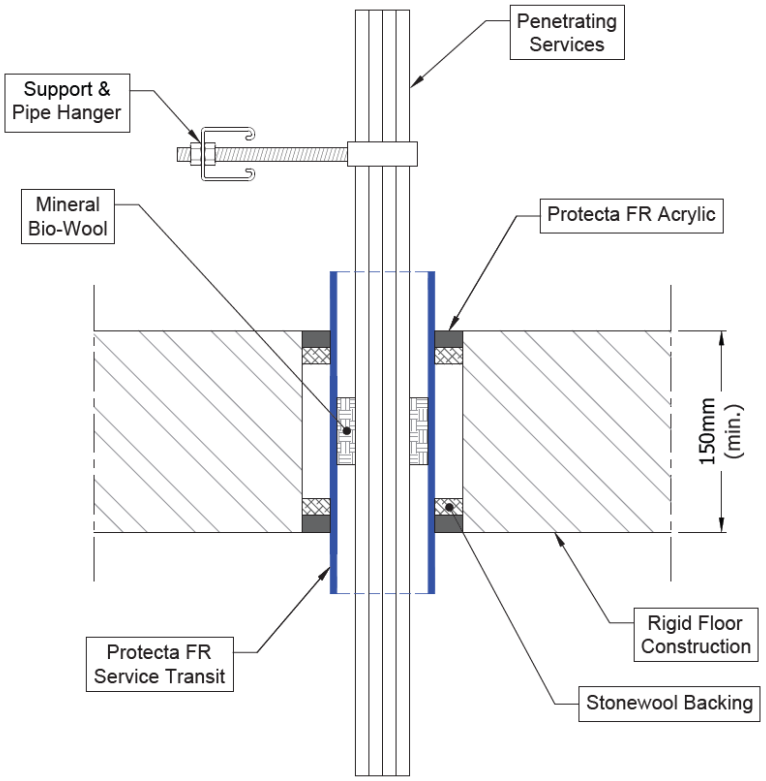
Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 14 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 240**
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 240** **EI 180**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 240** **EI 60**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 180**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 180** **EI 60**
Up to 50 mm diameter bundle of cables up to 80 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 240** **EI 120**
Up to 80 mm diameter bundle of cables up to 50 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 240** **EI 60**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 120**
Up to 100 mm diameter bundle of cables up to 50 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 120** **EI 60**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Empty filled at mid-depth with 50 mm deep plug of Mineral Bio Wool	All inlay sizes specified above	All transit sizes specified above	**E 240** **EI 180**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**E 120 C/U** **EI 60 C/U**
	6.0 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 120 C/U**

A.7 Timber floor constructions with floor thickness of minimum 150 mm

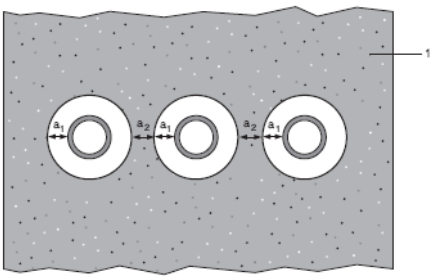
A.7.1 Penetration seals in timber floors

Penetration Seal: Cables, pipes and conduits fitted with minimum 250 mm long Protecta FR Service Transit central within the floor, or 150 mm long, top side within the floor. The annular space around the Service Transit is sealed with Protecta FR Acrylic, minimum 25 mm deep to both sides of the floor backed with Stonewool (minimum 33kg/m^3 density), minimum 25 mm deep. Spaces around services within the device are sealed with 50 mm deep Mineral Bio Wool installed centrally. Min. Separation between seals (a2) = 30 mm, min. Minimum separation between transit and supporting construction (a1) = 10 mm. Maximum aperture size is Ø 220mm.

Construction details:



Configuration 1:

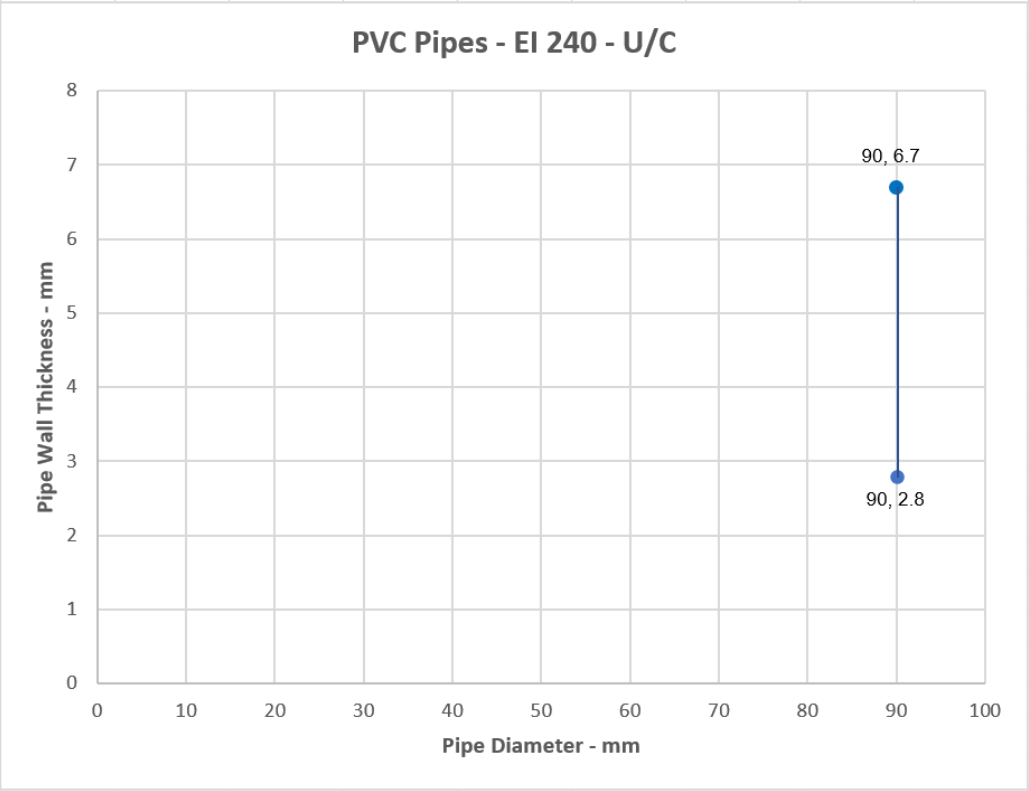


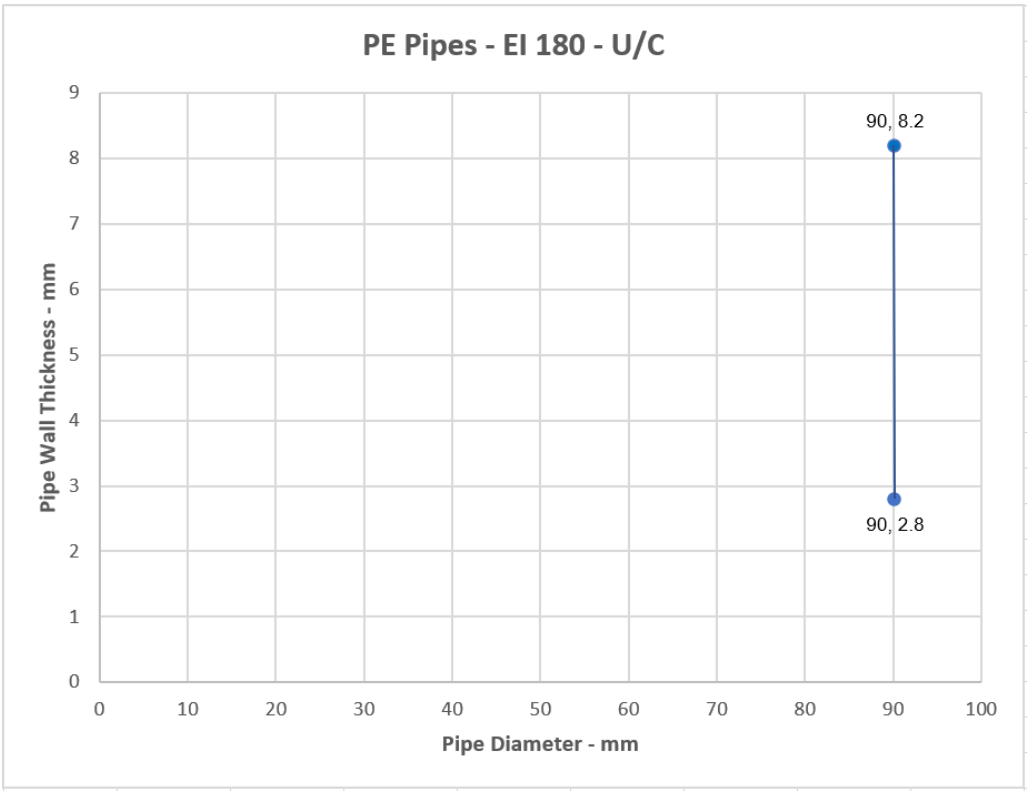
Key
1 Supporting construction
a1 Pipe / edge of seal separation (annular space)
a2 Separation between penetration seals

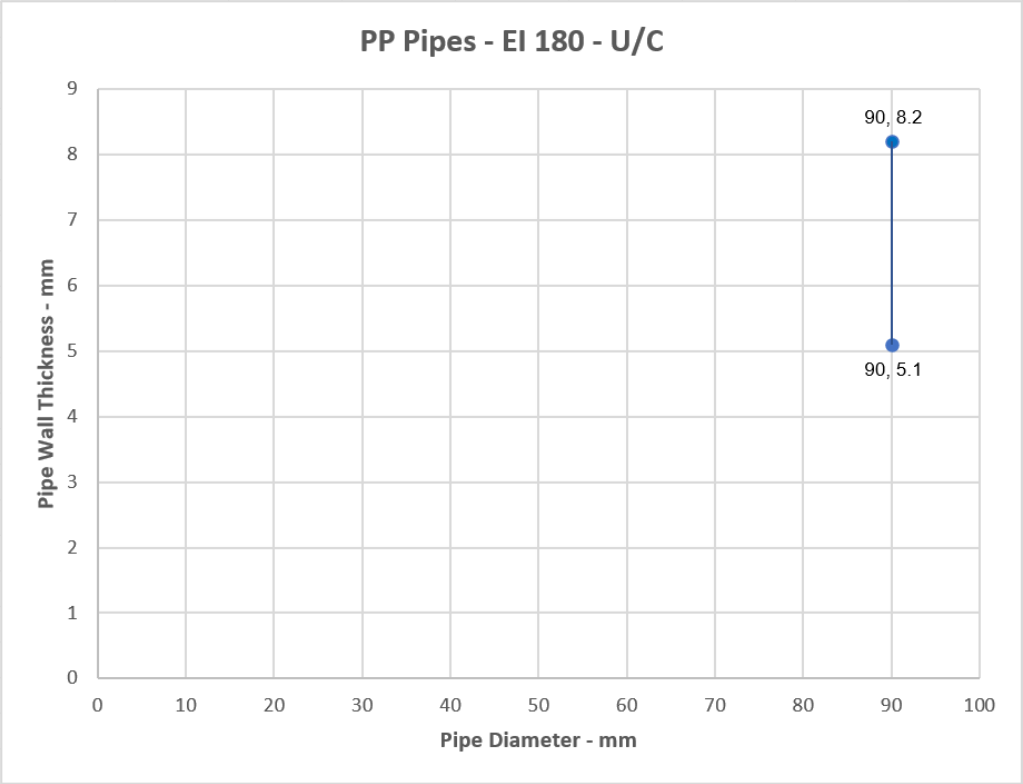
A.7.1.1

Services	Inlay size	Transit size	Classification
Up to 35 mm diameter bundle of cables up to 21 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**EI 120**
Up to 35 mm diameter bundle of cables up to 35 mm diameter	1.5 mm thick by 210 mm long	40 mm Ø x 250 mm long	**E 120** **EI 60**
Up to 28 mm diameter steel pipe with minimum 1.0 mm wall thickness	1.5 mm thick by 130 mm long	40 mm Ø x 150 mm long	**EI 120 C/U**
Up to 50 mm diameter bundle of cables up to 21 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**EI 120**
Up to 50 mm diameter bundle of cables up to 50 mm diameter	2.0 mm thick by 210 mm long	63 mm Ø x 250 mm long	**E 120** **EI 60**
Up to 80 mm diameter bundle of cables up to 21 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**EI 120**
Up to 80 mm diameter bundle of cables up to 50 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 120** **EI 60**
Up to 80 mm diameter bundle of cables up to 80 mm diameter	4.0 mm thick by 210 mm long	90 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**EI 120**
Up to 100 mm diameter bundle of cables up to 50 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 120** **EI 60**
Up to 100 mm diameter bundle of cables up to 80 mm diameter	4.5 mm thick by 210 mm long	110 mm Ø x 250 mm long	**E 90** **EI 60**
Up to 100 mm diameter bundle of cables up to 21 mm diameter	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120**
Up to 90 mm diameter PVC pipe with wall thickness 2.8 – 6.7 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120 U/C**
Up to 90 mm diameter PE pipe with wall thickness 2.8 – 8.2 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120 U/C**
Up to 90 mm diameter PP pipe with wall thickness 5.1 – 8.2 mm *	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120 U/C**
Empty filled at top-side with 50 mm deep plug of Mineral Bio Wool	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120**
	All inlay sizes specified above	All transit sizes specified above	**E 120** **EI 120**
Up to 32mm diameter plastic pipes in bundle, empty or with penetrating bundle of cables up to 21 mm diameter			**E 120 C/U** **EI 60 C/U**
	6.0 mm thick by 130 mm long	110 mm Ø x 150 mm long	**EI 120 U/C**

*See below graphs for interpolation pipe sizes

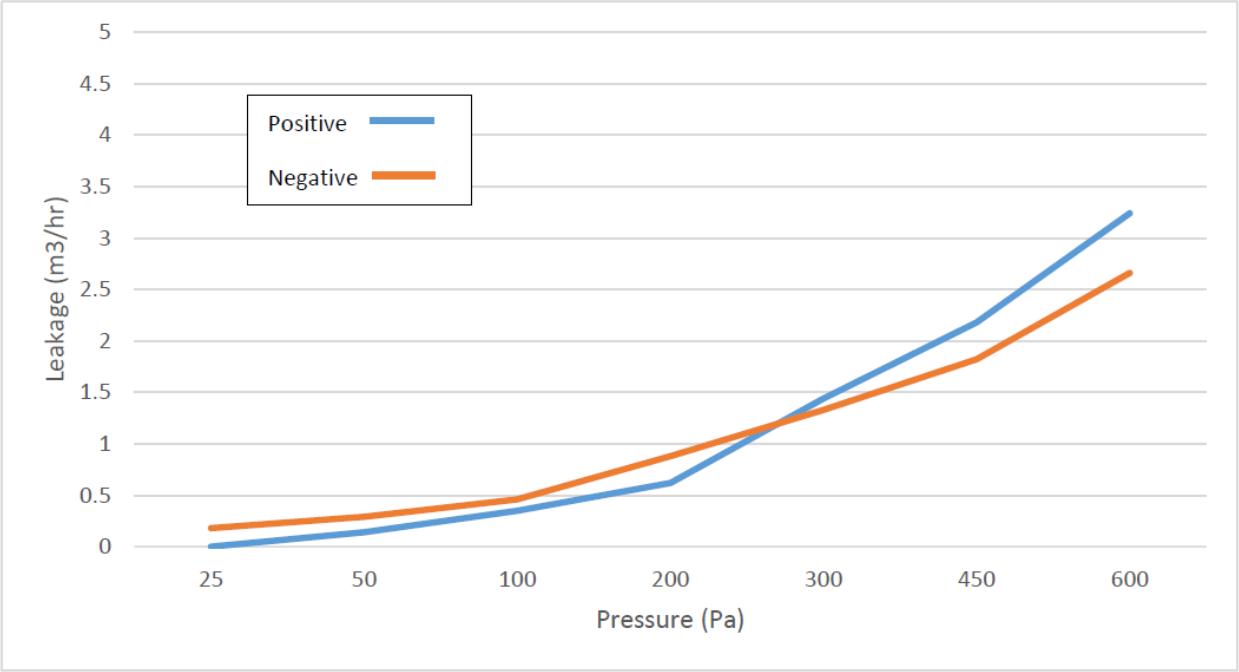

PVC Pipes - EI 240 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 6.7
90, 2.8
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
60
70
80
90
100


PE Pipes - EI 180 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 8.2
90, 2.8
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
80
90
100

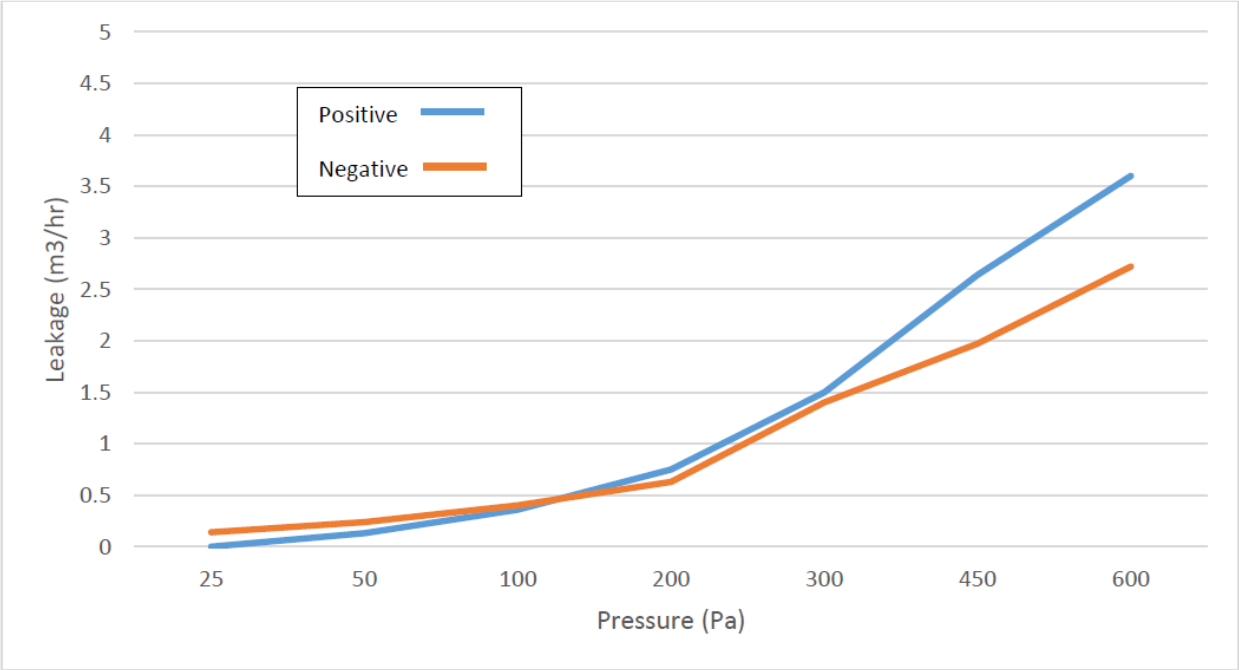

PP Pipes - EI 180 - U/C
Pipe Wall Thickness - mm
Pipe Diameter - mm
90, 8.2
90, 5.1
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
80
90
100

ANNEX B – Air Permeability – Protecta FR Service Transit

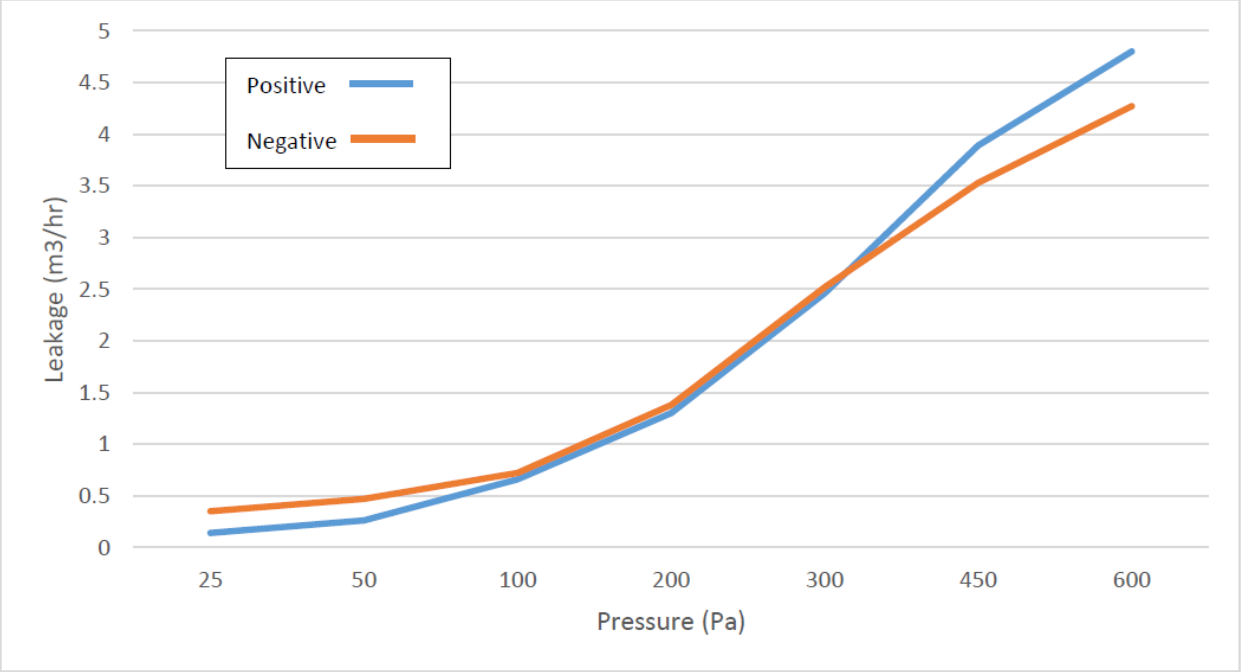
Product tested	110mm Protecta FR Service Transit with Bio wool seal no services		
Summary of testing procedure			Result
	Pressure (Pa)	Leakage (m^3/h)	Leakage ($m^3/m^2/h$)
Results under negative chamber pressure	25	0.18	N/A
	50	0.29	N/A
	100	0.46	N/A
	200	0.88	N/A
	300	1.33	N/A
	450	1.82	N/A
	600	2.66	N/A
Results under positive chamber pressure	25	0.08	N/A
	50	0.14	N/A
	100	0.35	N/A
	200	0.62	N/A
	300	1.44	N/A
	450	2.18	N/A
	600	3.24	N/A



Product tested	110mm Protecta FR Service Transit with single 12mm cable through Bio wool seal		
Summary of testing procedure			Result
	Pressure (Pa)	Leakage (m^3/h)	Leakage ($m^3/m^2/h$)
Results under negative chamber pressure	25	0.14	N/A
	50	0.24	N/A
	100	0.4	N/A
	200	0.63	N/A
	300	1.4	N/A
	450	1.97	N/A
	600	2.72	N/A
Results under positive chamber pressure	25	0.05	N/A
	50	0.13	N/A
	100	0.36	N/A
	200	0.75	N/A
	300	1.5	N/A
	450	2.64	N/A
	600	3.6	N/A



Product tested	110mm Protecta FR Service transit with 50mm bundle 12mm cables through Bio wool seal		
Summary of testing procedure			Result
	Pressure (Pa)	Leakage (m^3/h)	Leakage ($m^3/m^2/h$)
Results under negative chamber pressure	25	0.35	N/A
	50	0.47	N/A
	100	0.72	N/A
	200	1.38	N/A
	300	2.52	N/A
	450	3.53	N/A
	600	4.27	N/A
Results under positive chamber pressure	25	0.14	N/A
	50	0.26	N/A
	100	0.66	N/A
	200	1.3	N/A
	300	2.46	N/A
	450	3.89	N/A
	600	4.8	N/A



Product tested	110mm Protecta FR Service transit with 80mm bundle 12mm cables through Bio wool seal		
Summary of testing procedure			Result
	Pressure (Pa)	Leakage (m^3/h)	Leakage ($m^3/m^2/h$)
Results under negative chamber pressure	25	1.43	N/A
	50	2.29	N/A
	100	3.84	N/A
	200	6.51	N/A
	300	9	N/A
	450	11.6	N/A
	600	14.15	N/A
Results under positive chamber pressure	25	1.43	N/A
	50	1.87	N/A
	100	3.59	N/A
	200	6.19	N/A
	300	8.63	N/A
	450	11.7	N/A
	600	14.43	N/A