

UL-EU CERTIFICATE

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UL-EU-00915-EN

Issue date
2015-10-09

Issue No.
5

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2026-04-27

Expiry date
2036-04-26



4705

This is to acknowledge that:
Polyseam Ltd

Address:
15 St Andrews Road
Huddersfield, West Yorkshire
HD1 6SB, UK

Has had the product:
Protecta FR Pipe Wrap

evaluated and meets the requirements of the standards:

EAD 350454-00-1104, September 2017 / EN 13501-2

Places of production:
Polyseam Ltd
15 St Andrews Road
Huddersfield, West Yorkshire
HD1 6SB, UK

Authorised Signatory:

A handwritten signature in blue ink, appearing to read 'Chris Johnson'.

Chris Johnson
Issued by UL International (UK) Ltd

This is to certify that representative samples of the Certified Product listed above have been investigated by Underwriters Laboratories to the Standard(s) indicated on this Certificate, in accordance with the UL Global Services Agreement and the UL-EU Mark Service Terms and Conditions ("Agreement"). The Certificate Holder is entitled to use the UL-EU Mark for the Certified Product listed on the certificate and manufactured at the production site(s) listed, in accordance with the terms of the Agreement. Only those products bearing the UL-EU Mark for Europe should be considered as being covered by UL's UL-EU Mark Service. This Certificate shall remain valid through the Expiration date, unless a Standard identified on this Certificate is amended or withdrawn prior to that date or there is a non-compliance with the Agreement.



Appendix UL-EU CERTIFICATE UL-EU-00915-EN

This certificate relates to the use of Protecta FR Pipe Wrap for fire stopping where there are service penetrations through floors and walls. The detailed scope is given in pages 3 to 108 of this Certificate. This shows the thickness and acceptable dimensions, substrates and orientations required to provide fire resistance periods of up to 240 minutes for differing services and wall/floor constructions.

The product is certified
on the basis of:

- i) UKTA 25/0017
- ii) UK – CERTIFICATE OF CONSTANCY OF PERFORMANCE 0843 – CPR – 1435
- iii) Inspection and surveillance of factory production control by UL
- iv) Fire resistance test data in accordance with EN 1366-3
- v) Classification in accordance with EN 13501-2
- vi) Durability and Serviceability as defined in EAD 350454-00-1104, September 2017

The durability class of Protecta FR Pipe Wrap is X - intended for use at conditions exposed to weathering. Includes lower use categories.

Protecta FR Pipe Wrap is a pipe closure device used to form penetration seals where combustible pipes and insulated metal pipes penetrate walls and floors. The Protecta FR Pipe Wrap is supplied in Polyethylene bags size according to pipe diameter.

According to EN 1366-3: 2021+A1: 2024, Clause H.4.1.8.6.2, the following end uses are envisaged* based upon the tested pipe end configuration:

Pipe material	Tested pipe end	Envisaged use scenario
Metal	C/U or C/C	Closed pipe systems (e.g. systems under pressure)
	U/U, U/C or C/U	Ventilated pipe systems (e.g. sewage pipes) and for closed pipe systems
Plastic	U/U or C/U	Ventilated pipe systems and for closed pipe systems
	U/U	Ventilated pipe systems, for rainwater systems and for closed pipe systems

* In the case where a national prescription is in conflict with the content of the table above, the national prescriptions prevail.



Appendix UL-EU CERTIFICATE UL-EU-00915-EN

A) Protecta FR Pipe Wrap Used in Conjunction with Protecta EX Mortar

1. Specification of the Intended Uses of the Product

- 1) The specific elements of construction that the system Protecta EX Mortar 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 or timber studs* lined on both faces with minimum 2 layers of 12.5 mm thick boards. Flexible wall solutions may also be used in rigid walls, with a minimum density of 350 kg/m³.
- b. Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.
- c. Rigid floors: The floor must have a minimum thickness of 100 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

* 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 EX Mortar may be used to seal apertures in the separating element up to 2400 mm wide by 1200 mm high in a wall, and 2400 mm by 1200 mm in a floor. The additional sizes that are permitted in floors are:

Width (mm)	Length (mm)
1200	12000
≤ 800	∞ (infinite)

Where apertures in floors are reinforced with 150 mm long by ≥ 10 mm Ø rebar sections drilled 100 mm into the supporting construction ≤ 300 mm centres in the middle of ≥ 120 mm mortar depth, the permitted aperture size may be increased to 3600 mm by 2600 mm. The additional sizes that are permitted are:

Width (mm)	Length (mm)
1800	18000
≤ 1500	∞ (infinite)

The minimum permitted separation between adjacent seals/apertures is 100 mm. Services should be a minimum of 25mm from seal edges. Services within the system Protecta EX Mortar seal do not require a minimum separation, except pipes where combustible pipe insulation penetrates the seal and plastic pipe penetrations which should be a minimum of 30 mm from other services in the aperture (see pages 7 to 41).



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B) Protecta FR Pipe Wrap Used in Conjunction with Protecta FR Board

1. Specification of the Intended Uses of the Product

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

- a. 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. Apertures are not required to be lined. Flexible wall solutions may also be used in rigid walls, with a minimum density of 350 kg/m³.
- b. 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/m³.
- c. Rigid floors: The floor must have a minimum thickness of 125 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

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

- 2) The system Protecta FR Board may be used to seal apertures in the separating element of unlimited width by 1200mm high in a wall (uninterrupted separating studs will be required at 2400 mm centres or less in flexible walls), or 2400mm high by 1200mm wide in rigid walls, and 2400mm by 1200 mm in a floor. The additional sizes that are permitted in floors are:

Where 2400 x 1200 mm is specified on pages 42 to 74

Width (mm)	Length (mm)
1200	12000
≤ 800	∞ (infinite)

Where 1200 x 600 mm is specified on pages 42 to 74

Width (mm)	Length (mm)
600	6000
≤ 400	∞ (infinite)

The minimum permitted separation between adjacent seals/apertures is 100 mm. Services should be a minimum of 25mm from seal edges. Services within the system Protecta FR Board seal do not require a minimum separation, except pipes where combustible pipe insulation penetrates the seal and plastic pipe penetrations which should be a minimum of 30 mm from other services in the aperture (there are exceptions in pages 42 to 74).



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C) Protecta FR Pipe Wrap in Rigid Walls and Floor Constructions

1. Specification of the Intended Uses of the Product

- 1) The specific elements of construction that the system Protecta FR Pipe Wrap may be used to provide a penetration seal in, are as follows:
 - a. 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/m³.
 - b. 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/m³.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.
- 2) Services in floors shall be supported at maximum 450 mm from the top face. Services in walls shall be supported at maximum 270mm from both faces of the wall.
- 3) The system Protecta FR Pipe Wrap may be cast, or friction fitted into rigid constructions, where the aperture fit the outside diameter of the wrapped service penetration. A gap around the wrap of maximum 10 mm is allowed, subject to the gap being filled with Protecta FR Acrylic to the full depth of the wrap. The minimum permitted separation between adjacent seals/apertures is 30 mm.
- 4) The system Protecta FR Pipe Wrap may be used to provide a penetration seal with specific supporting constructions and substrates (for details see pages 75 to 108).
- 5) Services through the system Protecta FR Pipe Wrap may be used in all angles between 90° and 45° in all directions, subject to metallic pipes only.
- 6) 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, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1. Where steel pipes are mentioned in pages 75 to 108, this includes iron pipes.
- 7) When installing the system Protecta FR Pipe Wraps in hollow floor slabs, the fire seal must be level with the soffit side. There must be sufficient thickness of concrete below the void for the depth of the fire seal. Where this is not the case, tubular voids should be plugged with EX Mortar before sealing the aperture.



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Product-type: Mortar		Intended use: Penetration Seal
Assessment method	Essential characteristic	Product Performance
BWR 2 Safety in case of fire		
EN 13501-1	Reaction to fire	Class F (Not tested)
EN 13501-2	Resistance to fire	See pages 7 to 108
BWR 3 Hygiene, health and environment		
EN 1026	Air permeability	No performance determined
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: IA2, 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	X
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



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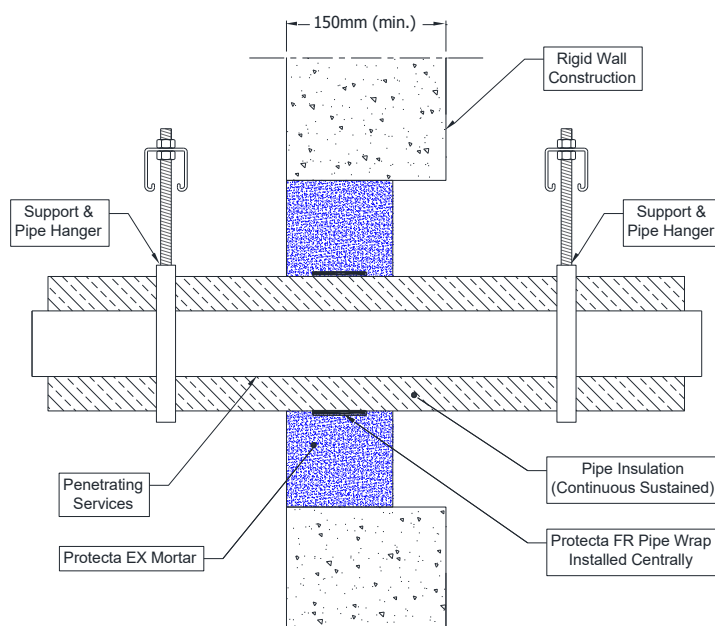
Protecta FR Pipe Wrap Used in Conjunction with Protecta EX Mortar

Rigid wall constructions according to A.1.1 with wall thickness of minimum 150 mm

Protecta FR Pipe Wrap pipe penetration seal with 100 mm deep Protecta EX Mortar

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 10 mm from seal edges), with min. 100 mm Protecta EX Mortar to either side of the wall. Protecta FR Pipe wraps are required to be centrally within the seal for pipes with combustible insulation. Maximum seal size as section A.1.2).

Construction details:



Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
40 mm diameter/1.5-14.2 mm wall	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	13 mm Elastomeric insulation minimum class B-s3,d0	EI 240 C/U
165 mm diameter/4.5-14.2 mm wall		9 mm Elastomeric insulation minimum class B-s3,d0	E 240 C/U, EI 30 C/U
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 1.8mm Protecta FR Pipe Wrap, fitted central	13 -19 mm Elastomeric insulation minimum class B-s3,d0	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*			

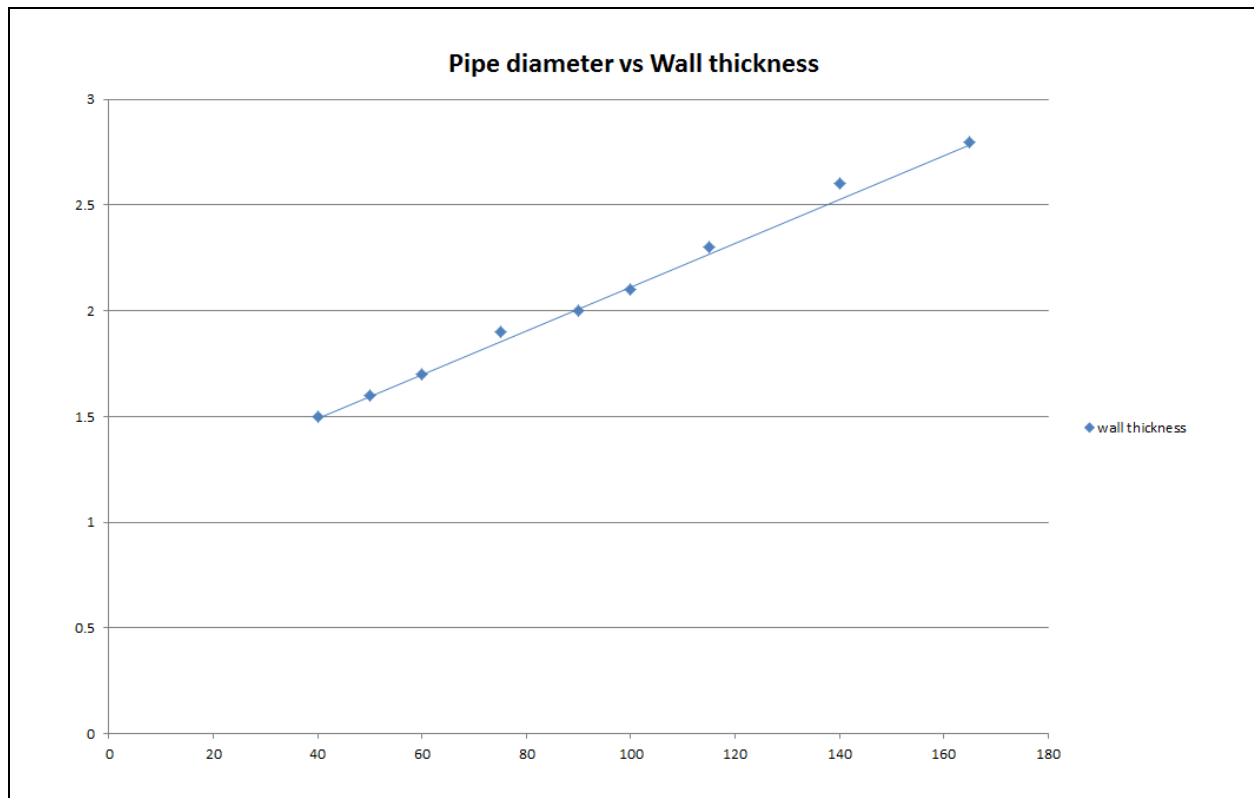
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	13-25 mm Elastomeric insulation minimum class B-s3,d0	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*			

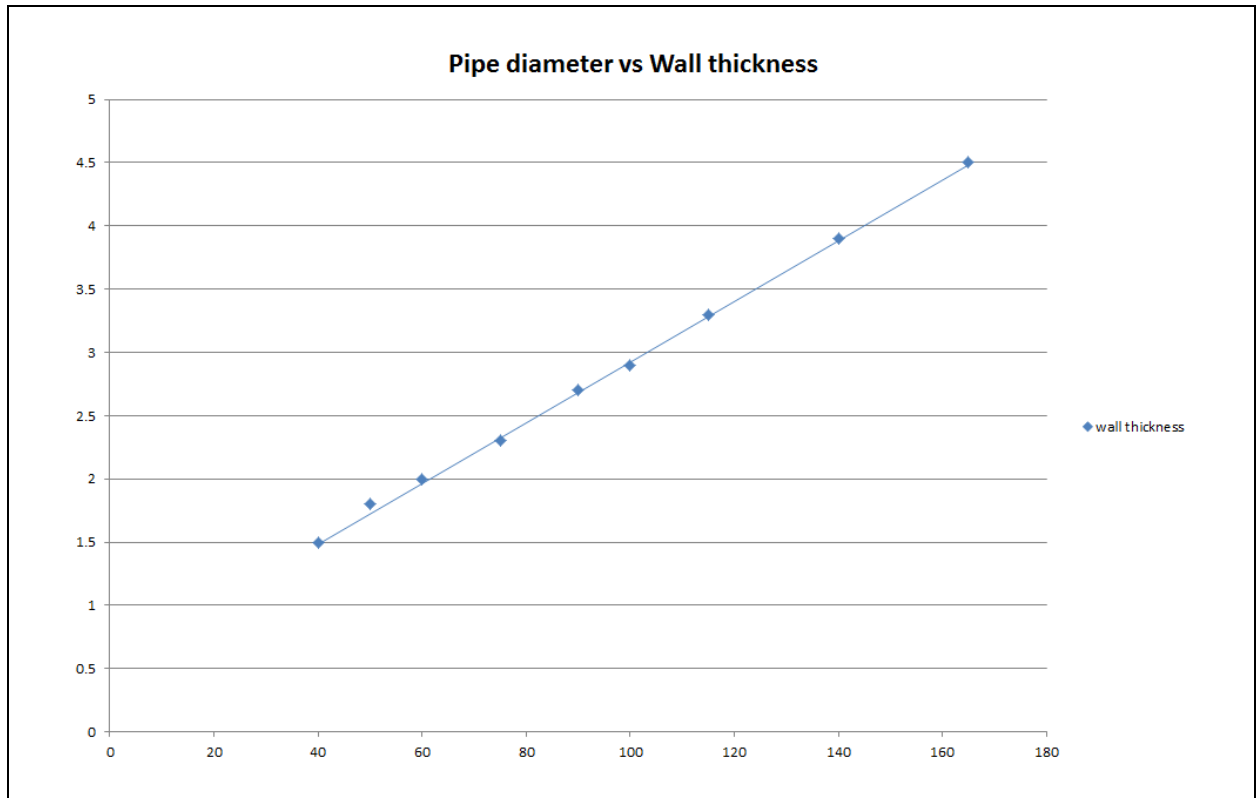
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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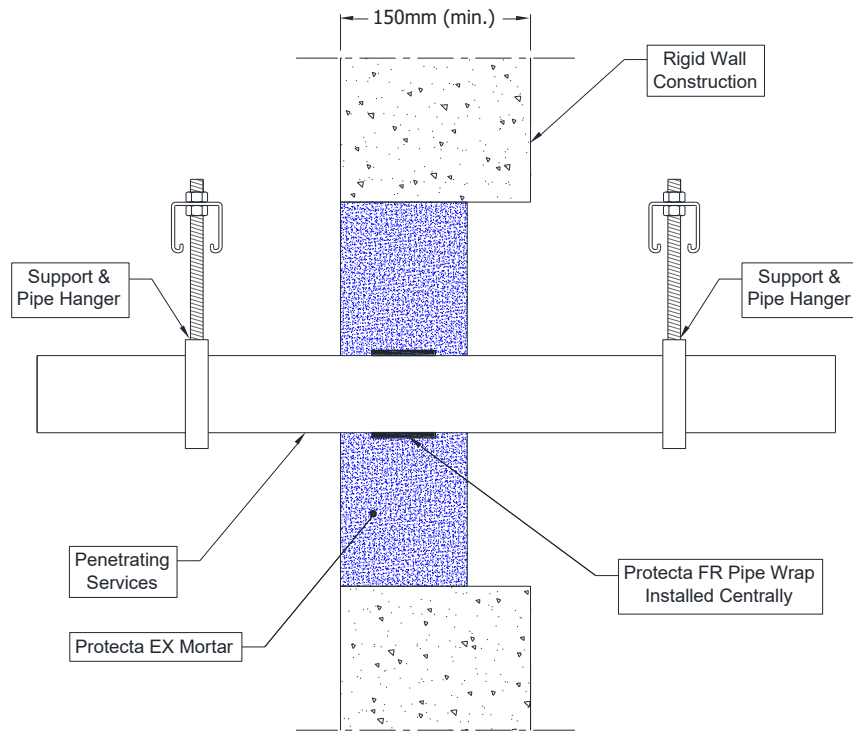


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Protecta FR Pipe Wrap pipe penetration seal with 100 mm deep Protecta EX Mortar

Penetration Seal: plastic pipes fitted at any position within the aperture (min. separation 10 mm from seal edges), with min. 100 mm Protecta EX Mortar to either side of the wall. Protecta FR Pipe wraps are required to be centrally within the seal. Maximum seal size as section A.1.2).

Construction details:



Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1			
315 mm diameter/9.2 mm wall	1 off 75 x 18 mm Protecta FR Pipe Wrap, fitted central	None	EI 120 C/C



Solutions

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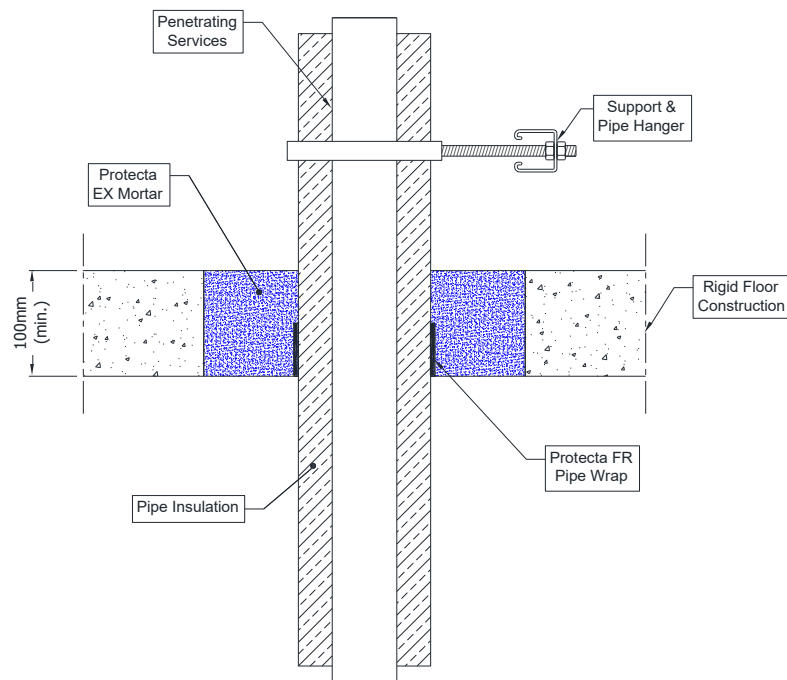
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Rigid floor constructions according to A.1.1 with floor thickness of minimum 100 mm

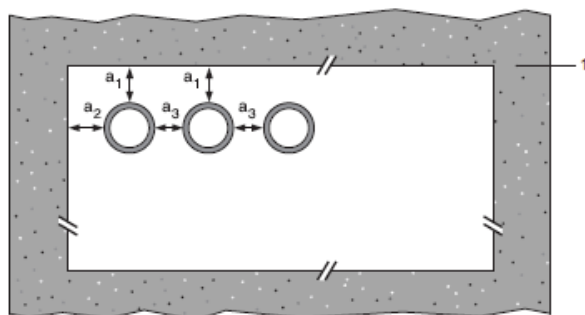
Protecta FR Pipe Wrap pipe penetration seal with 100 mm deep Protecta EX Mortar

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 25 mm from seal edges and 30 mm from other services), with min. 100 mm Protecta EX Mortar at any position within the floor. Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation. Maximum seal size as section A.1.2).

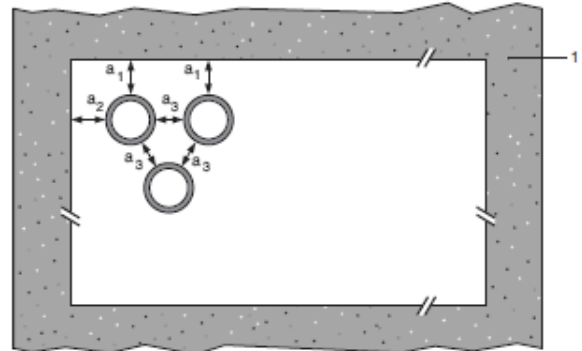
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



Solutions

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Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
Copper and steel pipes			
12 mm diameter/ ≥ 1 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	9 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/C
12-54 mm diameter/ ≥ 1 mm wall		19 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 180 C/C, EI 120 C/C
12-54 mm diameter/1 mm wall		9-18 & 20-25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	180 C/C, EI 60 C/C
12-54 mm diameter/1 mm wall		25 mm foil faced Phenolic Foam insulation	E 180 C/C, EI 120 C/C
12-159 mm diameter/ ≥ 1 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	100 mm Phenolic Foam insulation	EI 45 C/C
12-54 mm diameter/1 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	40 mm PU Foam insulation	E 120 C/C, EI 60 C/C
Mild or stainless steel pipes			
≤ 40 mm diameter/1.5-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	13 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 180 C/U
≤ 165 mm diameter/2.8-14.2 mm wall*		13 -19 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 180 C/U, EI 120 C/U
≤ 40 mm diameter/1-14.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	25 mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/U
≤ 324 mm diameter/1-14.2 mm wall*		25mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 240 C/U EI 120 C/U
≤ 324 mm diameter/1-14.2 mm wall*	50 x 5.4 mm Protecta FR Pipe Wrap fitted to the soffit	25-50mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 120 C/U

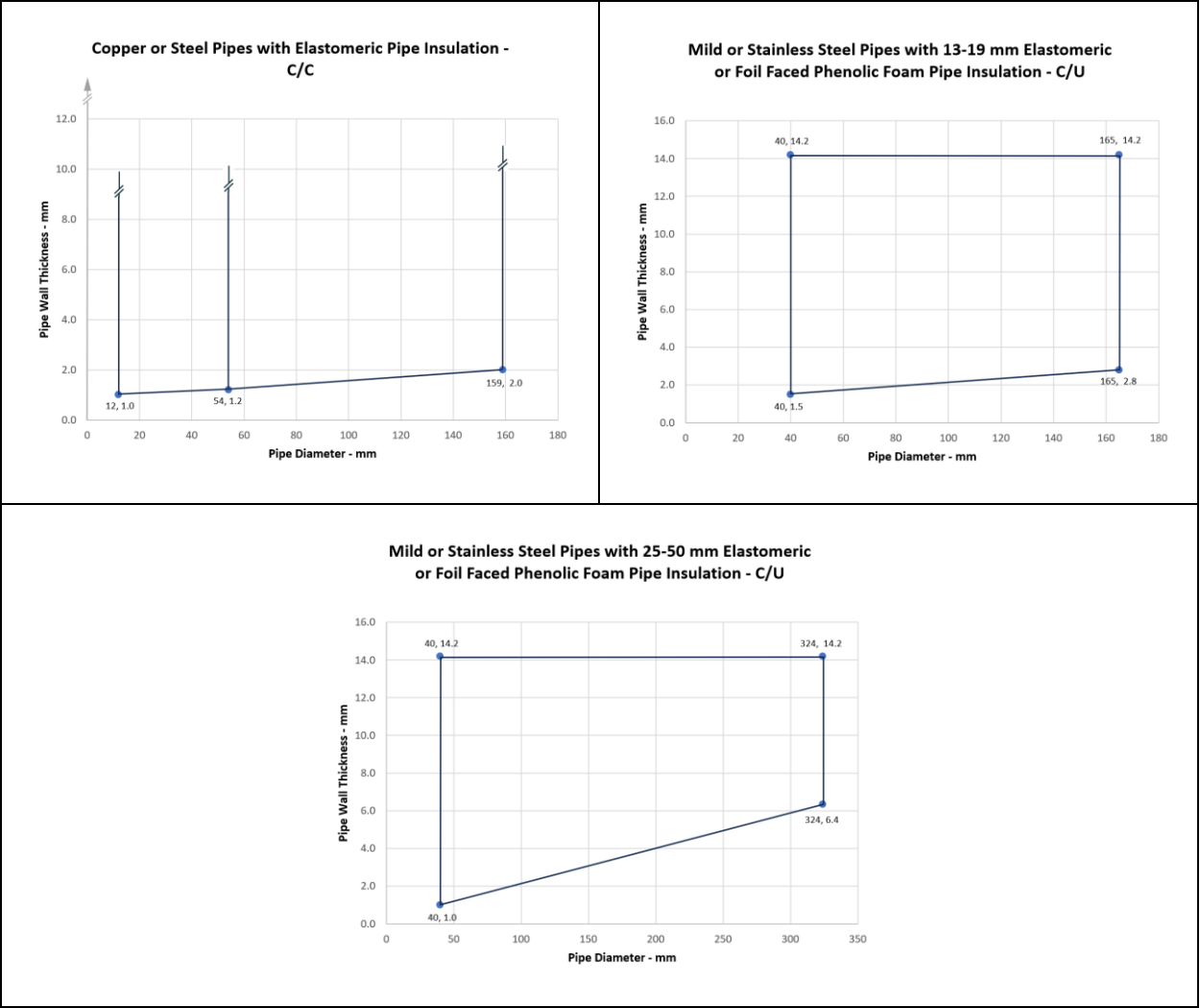
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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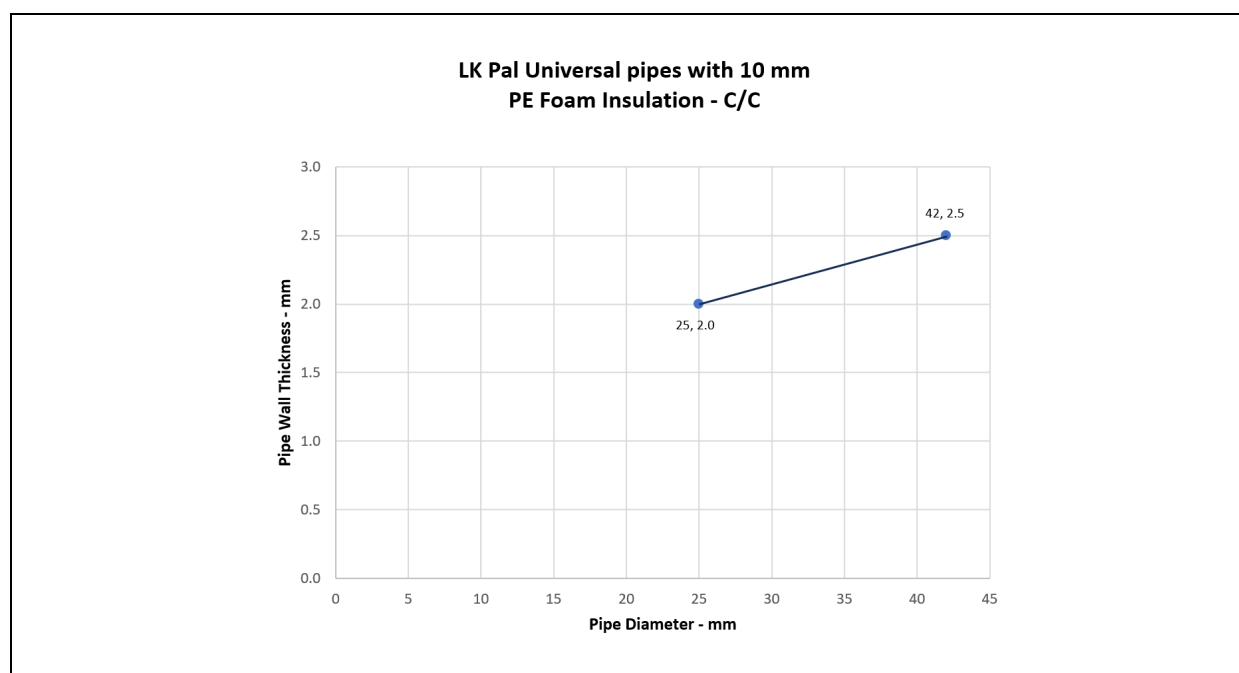
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Services	Wrap	Insulation	Classification
Alupex pipes			
16 mm diameter/2.25 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	9 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/C
16 mm diameter/2.25 mm wall		9-13 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 240 C/C, EI 180 C/C
20 mm diameter/2.25 mm wall			
25 mm diameter/2.5 mm wall			
16 mm diameter/2.25 mm wall		9-24 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam 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		25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 180 C/C
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			
16 mm diameter/2.25 mm wall			
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			
Alupex pipe inside a PP conduit e.g. LK Pal Universal pipes with additional PE insulated conduit, PiP Extra			
Outer PP conduit up to 42 mm diameter/2.0-2.5 mm wall with inner alupex pipe up to 32 mm diameter/2.0-3.0 mm wall*	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	10 mm PE foam insulation	E 240 C/C, EI 120 C/C

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

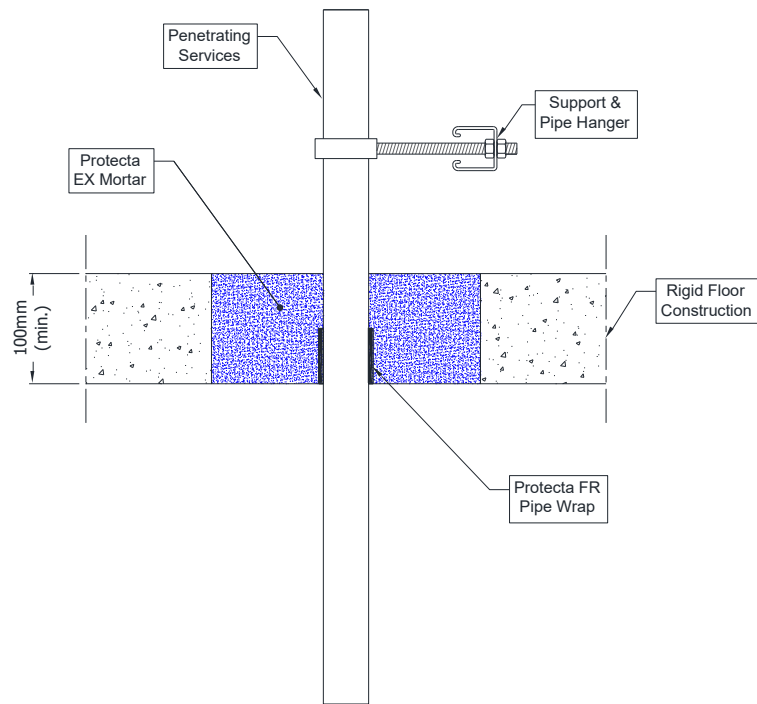


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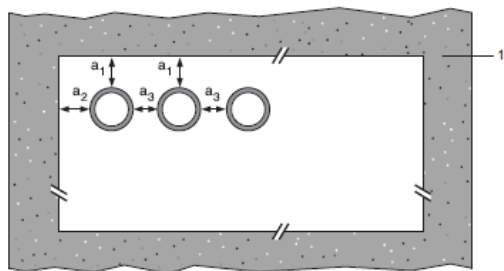
Protecta FR Pipe Wrap pipe penetration seal with 100 mm deep Protecta EX Mortar

Penetration Seal: Plastic pipes fitted at any position within the aperture, with min. 100 mm Protecta EX Mortar to the either surface of the floor or anywhere between. Protecta FR Pipe wraps are required to be fitted to the bottom of the seal, as indicated below. Minimum separation between penetration seals and seal edges of 30 mm (Configuration 1 & 2).

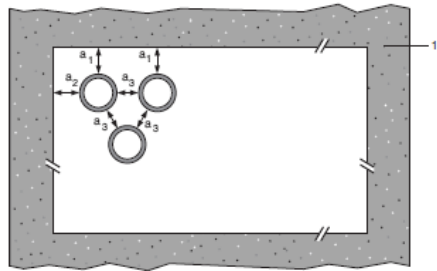
Construction details:



Configuration 1:



Configuration 2:



- Key**
- 1 Supporting construction
 - a1 Pipe / top edge of seal separation
 - a2 Pipe / side edge of seal separation
 - a3 Pipe / pipe separation



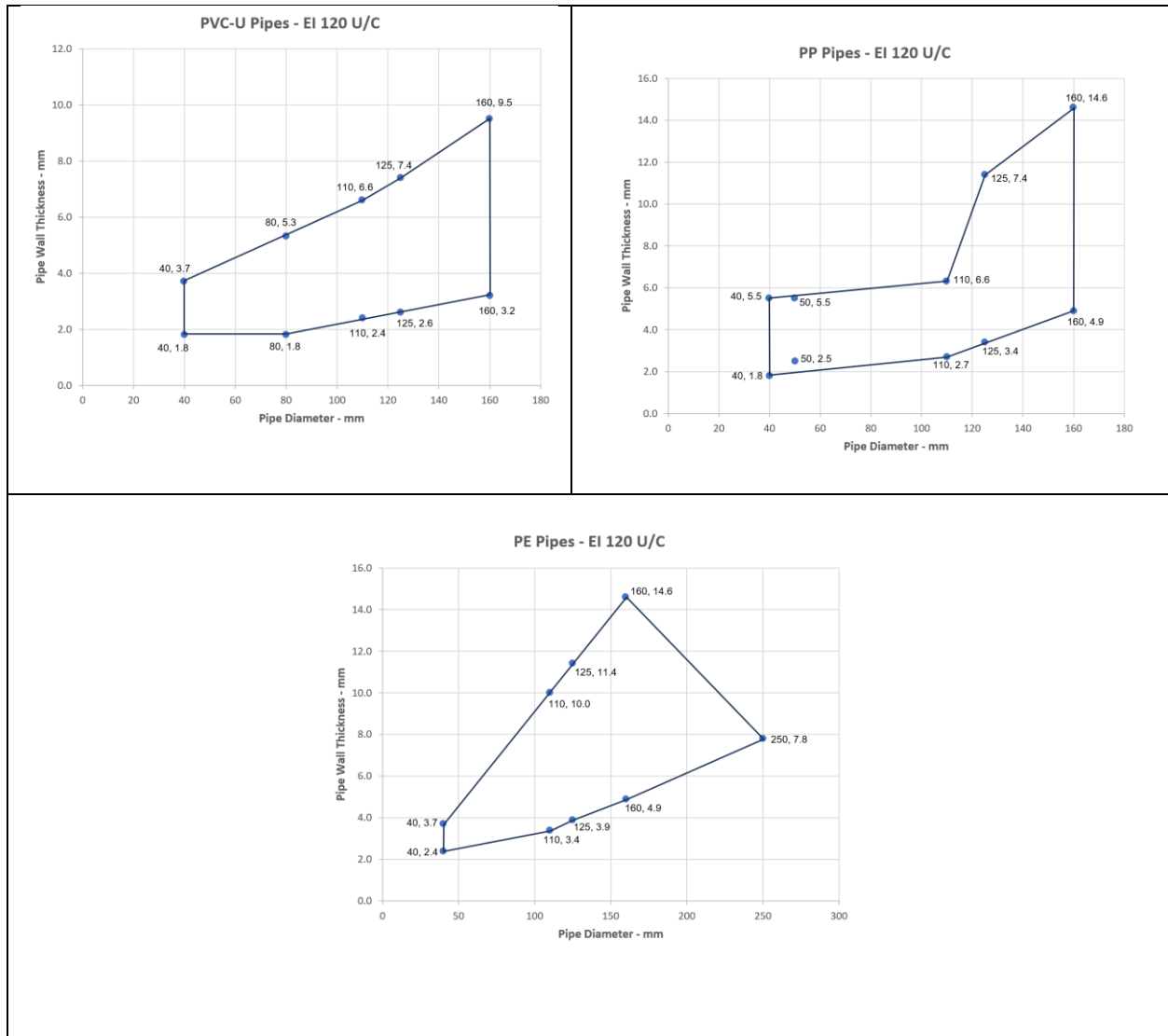
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Single side penetration seal with pipes

Services	Wrap	Maximum aperture	Classification
PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1			
Up to 40 mm diameter / 1.8-3.7 mm wall*	50 x 1.8 mm	As section 2. 4)	E 180 U/U, EI 120 U/U
Up to 80 mm diameter / 1.8-5.3 mm wall*	50 x 3.6 mm		EI 240 U/C
Up to 110 mm diameter / 2.4-6.6 mm wall*	50 x 3.6 mm		EI 240 U/C
Up to 125 mm diameter / 2.6-7.4 mm wall*	50 x 7.2 mm		EI 120 U/C
Up to 160 mm diameter / 3.2 mm wall	50 x 10.8 mm		EI 120 U/C
Up to 160 mm diameter / 3.3-9.5 mm wall	50 x 10.8 mm		EI 90 U/C
Up to 160 mm diameter / 3.3-4.4 mm wall*	50 x 10.8 mm		EI 120 C/C
Up to 160 mm diameter / 4.5 mm wall	50 x 10.8 mm		EI 240 C/C
Up to 110 mm diameter bundles containing pipes up to 20 mm diameter/ 1.0-1.5 mm wall, with or without up to 14 mm Ø cables (may be combined with PP and PE conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 2.4-6.6 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables*	50 x 3.6 mm	EI 120 U/C	
PP pipes according to EN 1451-1			
Up to 40 mm diameter /1.8-5.5 mm wall	50 x 1.8 mm	As section 2. 4)	EI 120 U/U
Up to 50 mm diameter /2.5-5.5 mm wall	50 x 3.6 mm		EI 240 C/C
Up to 75 mm diameter /3.5-5.5 mm wall	50 x 3.6 mm		EI 240 C/C
Up to 110 mm diameter /2.7-6.3 mm wall	50 x 3.6 mm		EI 240 U/C
Up to 125 mm diameter /3.4-11.4 mm wall	50 x 7.2 mm		EI 240 U/C
Up to 160 mm diameter /4.9-14.6 mm wall	50 x 10.8 mm		EI 240 U/C
Up to 110 mm diameter bundles containing pipes up to 20 mm diameter/ 1.9 mm wall, with or without up to 14 mm Ø cables (may be combined with PVC and PE conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 3.4-6.3 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables	50 x 3.6 mm		EI 60 U/C
PE pipes according to EN 1519-1, EN 12201-2 and EN 12666-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1			
Up to 40 mm diameter / 2.4-3.7 mm wall	50 x 1.8 mm	As section 2. 4)	EI 240 U/U
Up to 110 mm diameter / 3.4-10.0 mm wall	50 x 3.6 mm		EI 120 U/C
Up to 125 mm diameter / 3.9-11.4 mm wall	50 x 7.2 mm		EI 240 U/C
Up to 160 mm diameter / 4.9-14.6 mm wall	50 x 10.8 mm		EI 120 U/C
Up to 250 mm diameter / 7.8 mm wall	75 x 12.6 mm		EI 180 C/C
Up to 110 mm diameter bundles containing pipes up to 32 mm diameter/ 2.0-2.3 mm wall, with or without up to 14 mm Ø cables (may be combined with PVC and PP conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 2.7-10.0 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables	50 x 3.6 mm		E 120 U/C, EI 60 U/C



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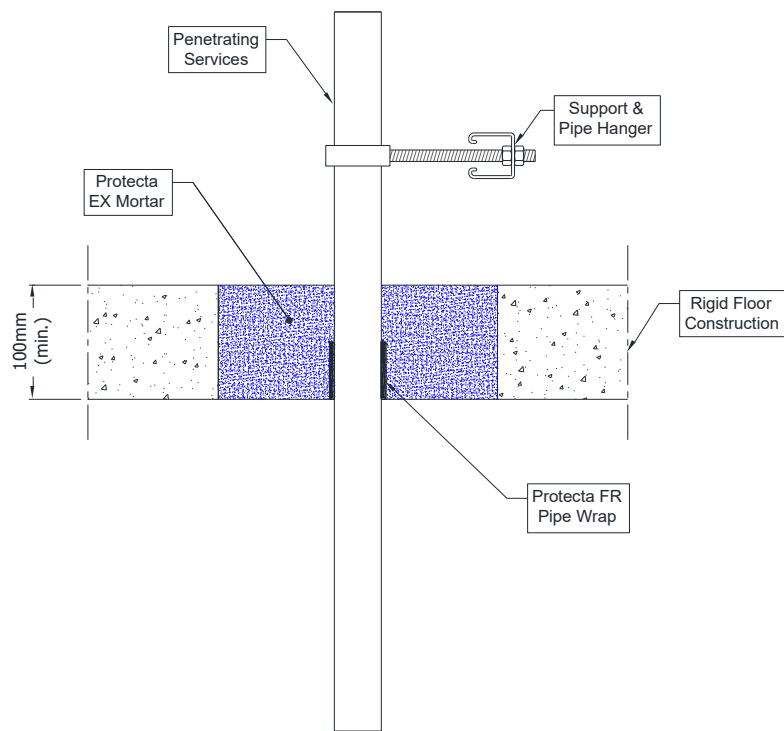


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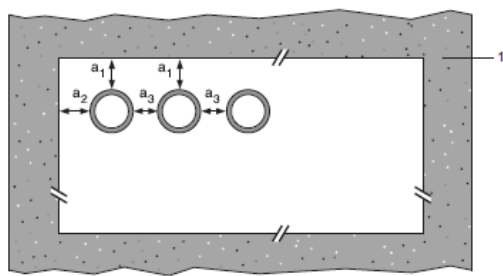
Protecta FR Pipe Wrap pipe penetration seal with 100 mm deep Protecta EX Mortar

Penetration Seal: Plastic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and from other services), with min. 100 mm Protecta EX Mortar to either surface of the floor or anywhere between. Protecta FR Pipe Wraps are required to be fitted to the bottom of the seal, as indicated below. Maximum seal size as section A.1.2).

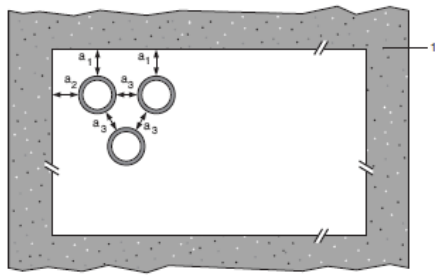
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



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Services	Wrap	Permitted configuration for seal separation	Classification
PEX pipe in pipe systems according to ISO 15875			
Maximum 54 mm diameter/0.4 mm wall thickness (outer pipe), 28 mm diameter/4.0 mm wall thickness (inner pipe)	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 C/C
Maximum 25 mm diameter/0.6 mm wall thickness (outer pipe), 15 mm diameter/2.5 mm wall thickness (inner pipe), single, or in bundles maximum 50 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
Rehau Raupiano Plus PP-DD according to DIN 4102			
40-50 mm diameter/1.8-2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.1 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	E 240 U/C, EI 120 U/C
160 mm diameter/3.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 120 U/C
Polo-Kal NG Poloplast PP-MV according to DIN 4102			
32-50 mm diameter/2.0 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
51-110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 180 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	EI 240 U/C
160 mm diameter/4.3 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Aquatherm Green SDR9 MF PP-RP according to ISO 21003			
32 mm diameter/3.6 mm wall thickness	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	EI 240 C/C
40-50 mm diameter/5.6-12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
63-110 mm diameter/12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
Wavin SiTech + PP-M B according to EN 13501-1			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C

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



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Services	Wrap	Permitted configuration for seal separation	Classification
Geberit Silent PP according to DIN 4102			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.9 mm wall thickness *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 120 U/C
160 mm diameter/4.9 mm wall thickness*	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
BluePower Multilayer pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.9 mm wall thickness*	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	EI 120 U/C
160 mm diameter/4.9 mm wall thickness*	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Uponor Decibel pipes according to EN 14366			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
Wavin AS+ pipes according to EN 12056 and DIN 1986-100			
32-50 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
75-110 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
125-200 mm diameter *	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 C/C
Huliot Ultra Silent pipe according to EN 1451-1 and DIN 1986-100			
32-50 mm diameter/1.8 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
200 mm diameter/6.2 mm wall thickness	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 C/C

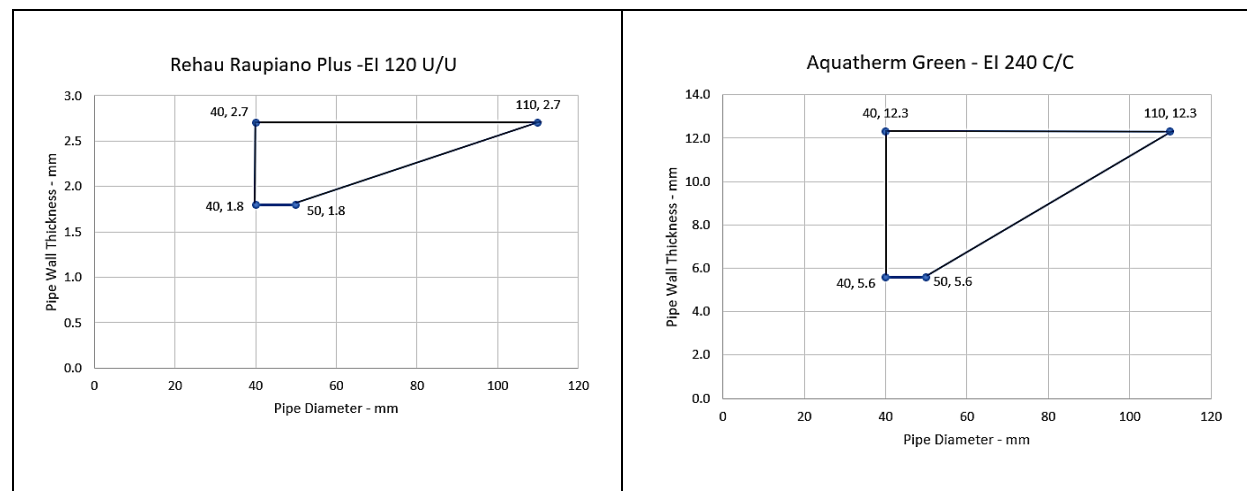
* Typical pipe diameters shown, see below graph for intermediate sizes



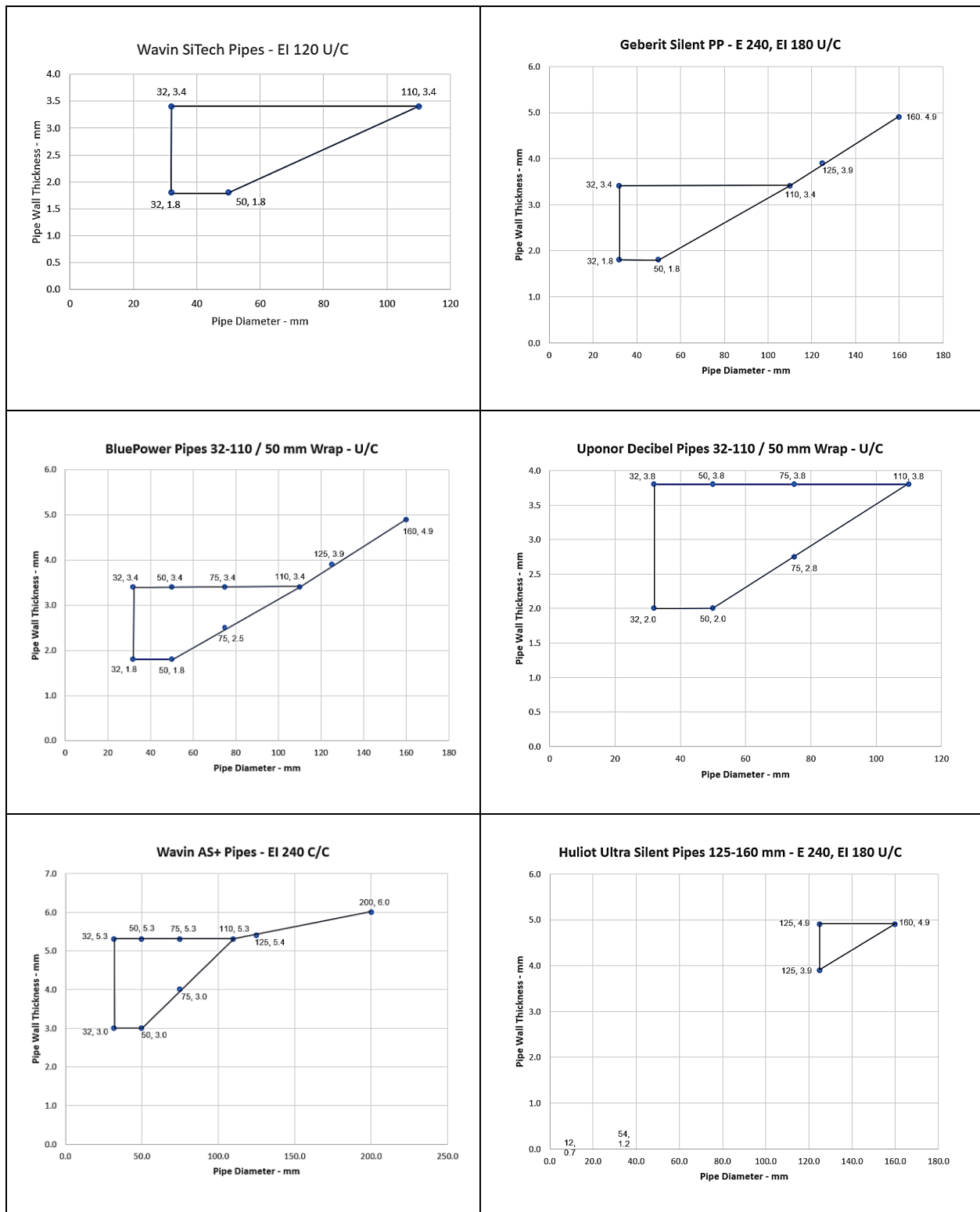
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Services	Wrap	Permitted configuration for seal separation	Classification
Valsir PP3 pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/2.7 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Valsir Blackfire pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Valsir Triplus pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C

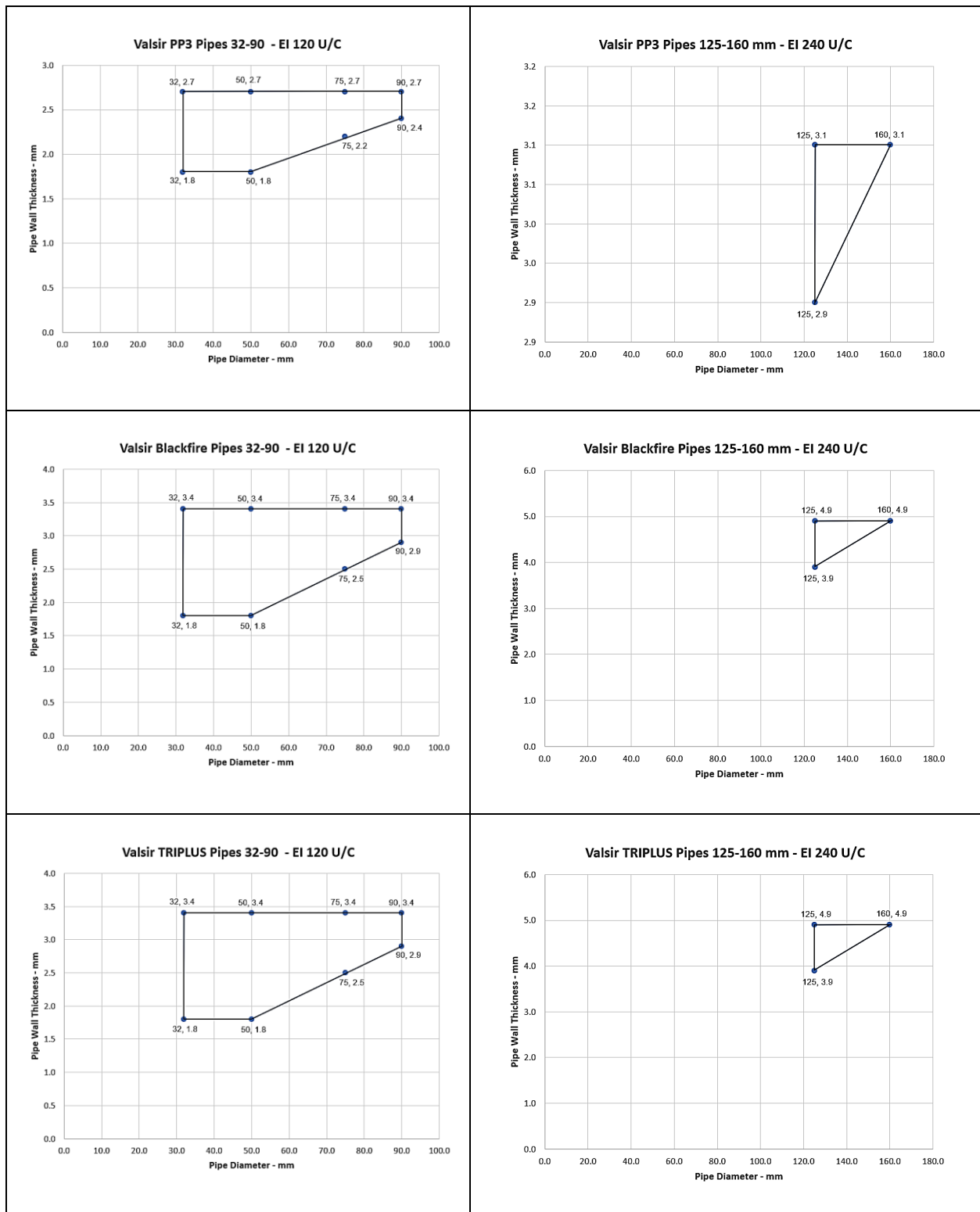
* Typical pipe diameters shown, see below graph for intermediate sizes



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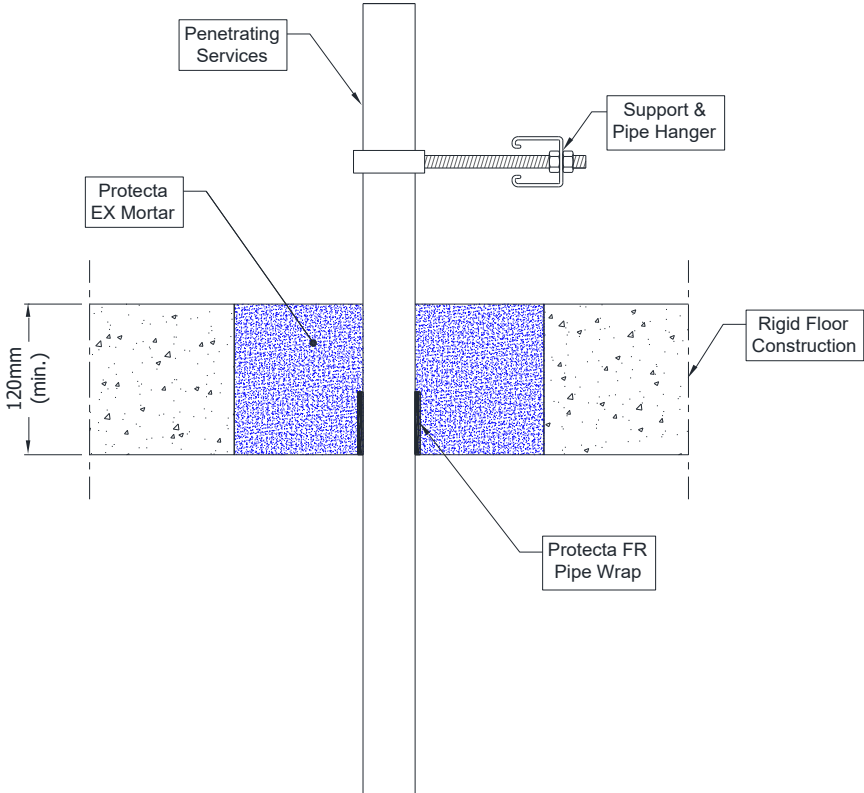
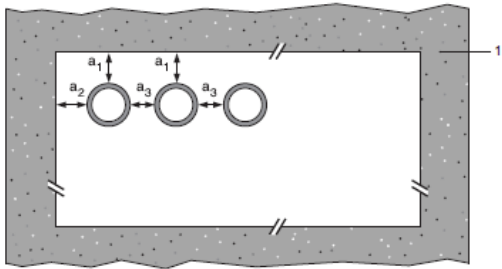
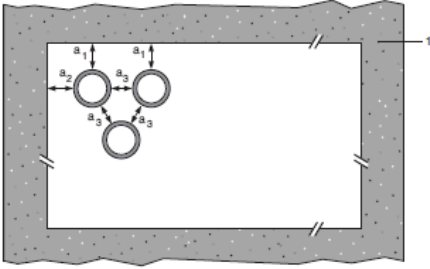


Solutions

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Protecta FR Pipe Wrap pipe penetration seal with Protecta EX Mortar

Penetration Seal: Plastic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and from other services), with Protecta EX Mortar to either surface of the floor or anywhere between. Protecta FR Pipe Wraps are required to be fitted to the bottom of the seal, as indicated below. Maximum seal size as section A.1.2).	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction a1 Pipe / top edge of seal separation a2 Pipe / side edge of seal separation a3 Pipe / pipe separation	



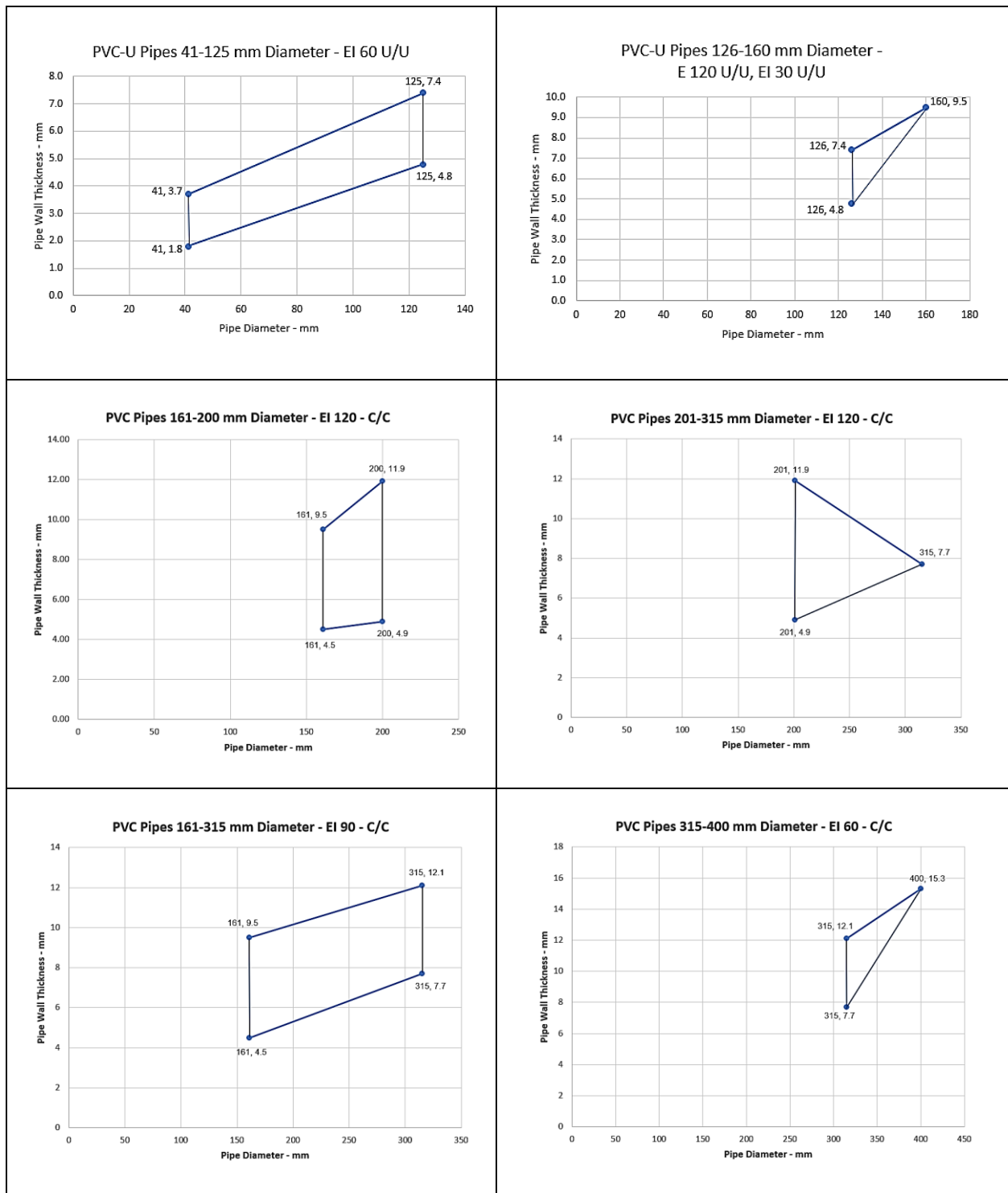
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Services	Wrap	Permitted configuration for seal separation	Min. mortar depth and floor thickness	Classification
PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1				
Up to 40 mm diameter, wall thickness 1.8-3.7 mm	50 x 1.8 mm (1 x 1.8 layers)	1 & 2	150 mm	EI 120 U/U
Diameter 41 mm, wall thickness 1.8-3.7 mm to diameter 125 mm, wall thickness 4.8-7.4 mm*	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 60 U/U
125 mm diameter / 7.4 mm wall	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 120 U/U
Diameter 126 mm, wall thickness 4.8-7.4 mm to diameter 160 mm, wall thickness 9.5 mm*	75 x 10.8 mm (6 x 1.8 layers)	1	150 mm	E 120 U/U, EI 30 U/U
160 mm diameter / 9.5 mm wall	75 x 7.2 mm (4 x 1.8 layers)	1	150 mm	E 120 U/U, EI 30 U/U
160 mm diameter / 4.5-9.5 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	120 mm	EI 120 U/C, EI 120 C/C
Diameter 161 mm, wall thickness 4.5-9.5 mm to diameter 200 mm, wall thickness 4.9-11.9 mm*	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	120 mm	EI 120 C/C
200 mm diameter / 4.9-11.9 mm wall thickness	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	120 mm	EI 240 C/C
Diameter 201 mm, wall thickness 4.9-11.9 mm to diameter 315 mm, wall thickness 7.7 mm*	75 x 18 mm (10 x 1.8 layers)	1	120 mm	EI 120 C/C
315 mm diameter / 7.7 mm wall thickness	75 x 18 mm (10 x 1.8 layers)	1	120 mm	EI 120 C/C
Diameter 161 mm, wall thickness 4.5-9.5 mm to diameter 315 mm, wall thickness 7.7-12.1 mm*	75 x 18 mm (10 x 1.8 layers)	1	120 mm	EI 90 C/C
315 mm diameter / 12.1 mm wall thickness	75 x 18 mm (10 x 1.8 layers)	1	120 mm	EI 90 C/C
Diameter 315 mm, wall thickness 7.7-12.1 mm to diameter 400 mm, wall thickness 15.3 mm*	75 x 28.8 mm (16 x 1.8 layers)	1	120 mm	EI 60 C/C
400mm diameter / 15.3 mm wall thickness	75 x 28.8 mm (16 x 1.8 layers)	1 & 2	120 mm	EI 60 C/C

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



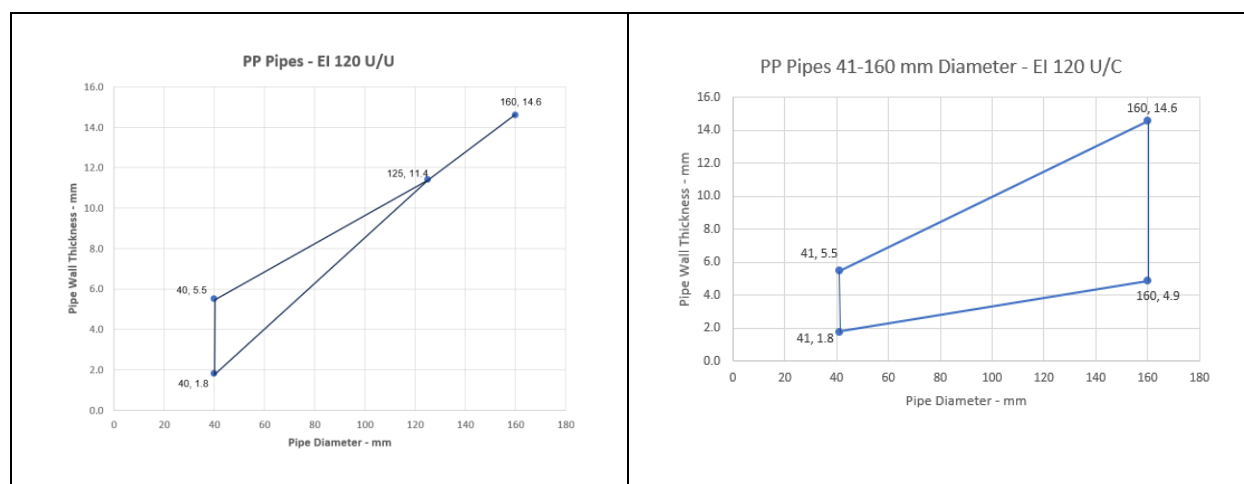
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Services	Wrap	Permitted configuration for seal separation	Min. mortar depth and floor thickness	Classification
PP pipes according to EN 1451-1				
Up to 40 mm diameter, wall thickness 1.8-5.5 mm	50 x 1.8 mm (1 x 1.8 layers)	1 & 2	150 mm	EI 120 U/U
Up to 125 mm diameter / 11.4 mm wall*	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 240 U/U
Diameter 41 mm, wall thickness 1.8-5.5 mm to diameter 160 mm, wall thickness 4.9-14.6 mm*	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	150 mm	EI 120 U/C
Up to 160 mm diameter/14.6 mm wall*	75 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 240 U/U
Diameter 161 mm, wall thickness 4.9-14.6 mm to diameter 200 mm, wall thickness 4.9-18.2 mm*	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	120 mm	EI 240 C/C
Diameter 201 mm, wall thickness 4.9-18.2 mm to diameter 315 mm, wall thickness 7.7 mm*	75 x 18 mm (10 x 1.8 layers)	N/A	150 mm	EI 180 C/C
Diameter 201 mm, wall thickness 4.9-18.2 mm to diameter 315 mm, wall thickness 7.7-28.6 mm*	75 x 18 mm (10 x 1.8 layers)	N/A	150 mm	EI 60 C/C
315 mm diameter / 7.7 mm wall	75 x 18 mm (10 x 1.8 layers)	N/A	150 mm	EI 180 C/C
315 mm diameter / 7.7-28.6 mm wall	75 x 18 mm (10 x 1.8 layers)	1	150 mm	EI 60 C/C
Diameter 315 mm, wall thickness 7.7-28.6 mm to diameter 400 mm, wall thickness 22.7 mm*	75 x 28.8 mm (16 x 1.8 layers)	1	150 mm	EI 60 C/C
400mm diameter / 22.7 mm wall thickness	75 x 28.8 mm (16 x 1.8 layers)	1 & 2	150 mm	EI 60 C/C

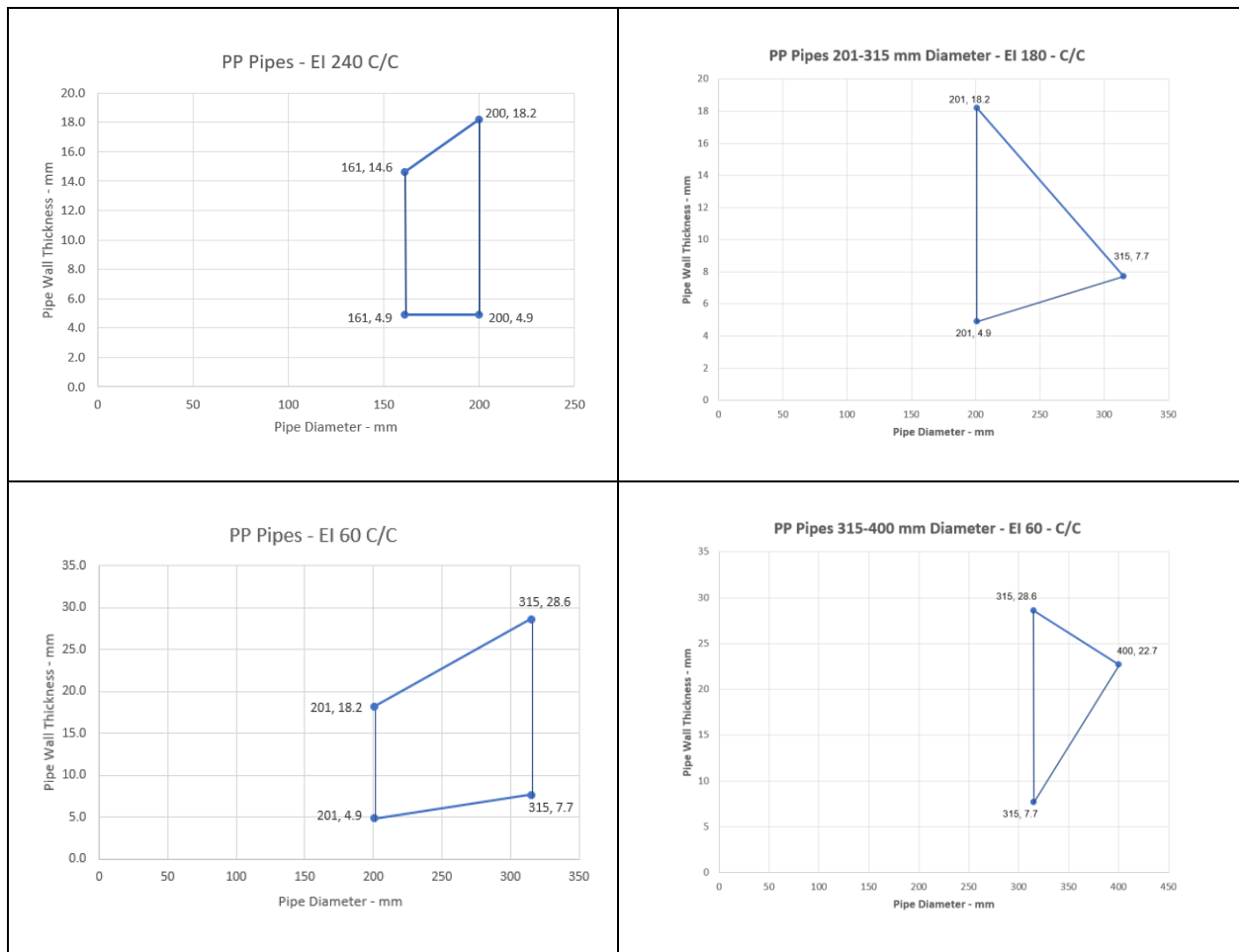
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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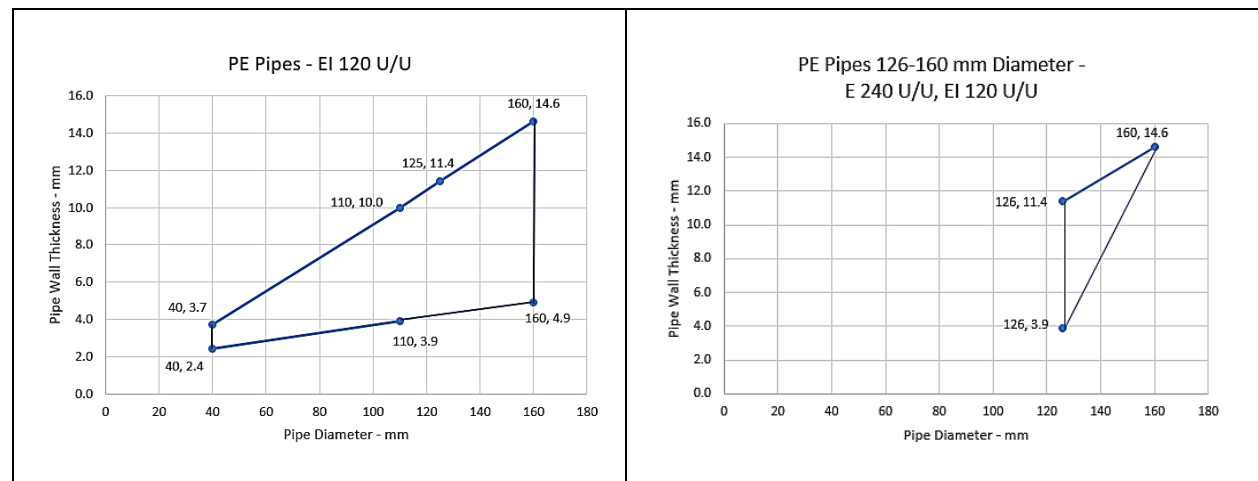
Solutions

Form-ULID-006104 V10.0

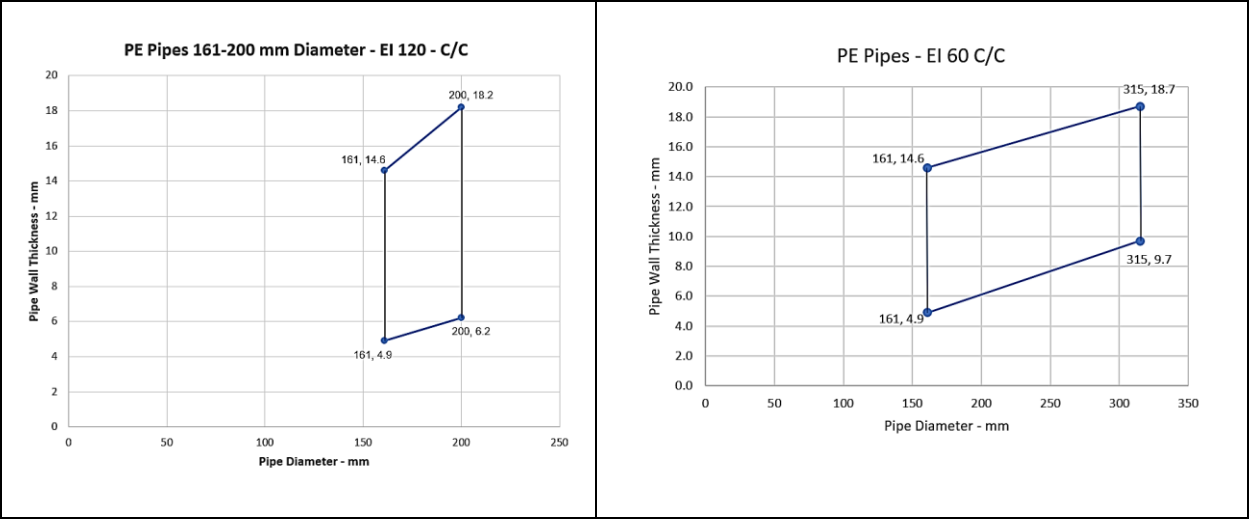
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Services	Wrap	Permitted configuration for seal separation	Min. mortar depth and floor thickness	Classification
PE pipes according to EN 1519-1, EN 12201-2 and EN 12666-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1				
Up to 40 mm diameter/2.4-3.7 mm wall*	50 x 1.8 mm (1 x 1.8 layers)	1 & 2	150 mm	EI 240 U/U
Up to 110 mm diameter/3.4-10 mm wall*	75 x 5.4 mm (3 x 1.8 layers)	1 & 2	150 mm	EI 240 U/U
Up to 125 mm diameter/11.4 mm wall*	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 240 U/U
Diameter 126 mm, wall thickness 3.9-11.4 mm to diameter 160 mm, wall thickness 14.6*	75 x 18 mm (10 x 1.8 layers)	N/A	150 mm	E 240 U/U, EI 120 U/U
Up to 160 mm diameter/4.9-14.6 mm wall*	75 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	EI 120 U/U
160 mm diameter / 14.6 mm wall	75 x 7.2 mm (4 x 1.8 layers)	1 & 2	150 mm	E 240 U/U, EI 120 U/U
Diameter 161 mm, wall thickness 4.9-14.6 mm to diameter 200 mm, wall thickness 6.2-18.2 mm*	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	150 mm	EI 120 C/C
200 mm diameter / 6.2-18.2 mm wall thickness	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	120 mm	EI 240 C/C
Diameter 161 mm, wall thickness 4.9-14.6 mm to diameter 315 mm, wall thickness 9.7-18.7 mm*	75 x 18 mm (10 x 1.8 layers)	N/A	150 mm	EI 60 C/C

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



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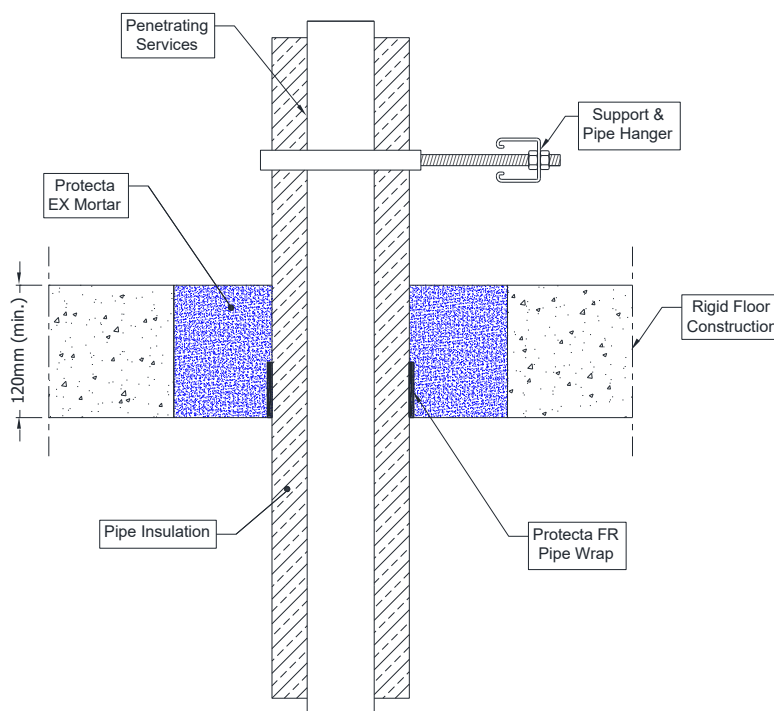
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Rigid floor constructions according to A.1.1 with floor thickness of minimum 120 mm

Protecta FR Pipe Wrap pipe penetration seal with 120 mm deep Protecta EX Mortar

Penetration Seal: CS (Continuous Sustained) insulated plastic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and 30 mm from other services), with min. 120 mm Protecta EX Mortar to either surface of the floor or anywhere between. Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation to the bottom of the seal, as indicated below. Maximum seal size as section A.1.2).

Construction details:



Single sided penetration seal with pipes

Services	Outer diameter including insulation	Pipe wrap	Pipe insulation	Classification
PE pipes according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	EI 240 C/C
	Maximum 178 mm diameter	75 x 10.8 mm (6 x 1.8 layers)		
	Maximum 260 mm diameter	75 x 18.0 mm (10 x 1.8 layers)	EI 120 C/C	
PP pipes according to EN 1852-1: 2009				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	E 240 C/C, EI 180 C/C
	Maximum 178 mm diameter	75 x 10.8 mm (6 x 1.8 layers)		EI 240 C/C
	Maximum 260 mm diameter	75 x 18.0 mm (10 x 1.8 layers)		EI 120 C/C

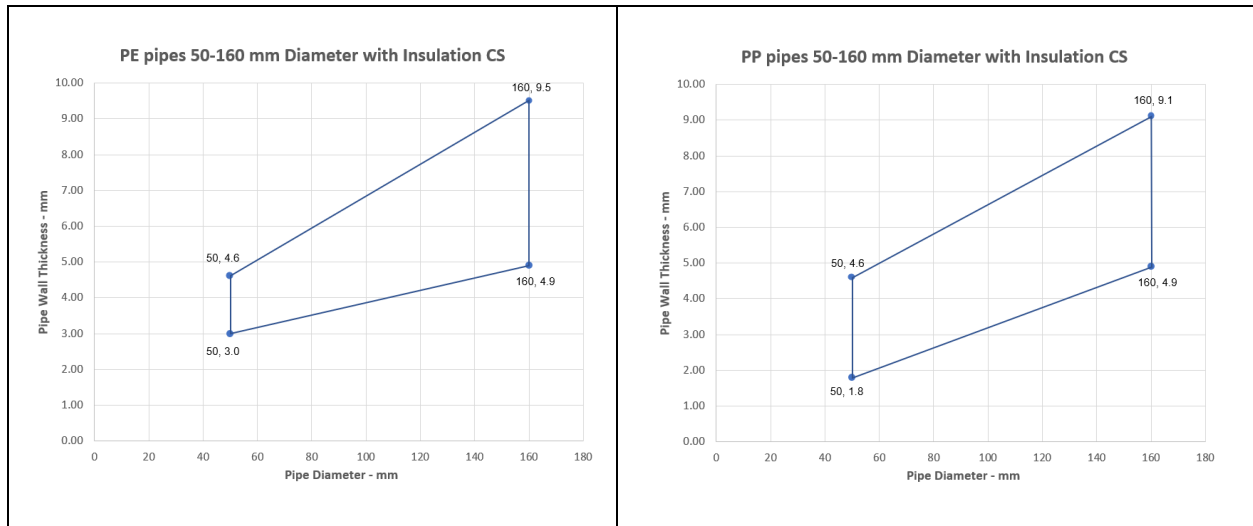
*See below graph for interpolation pipe sizes



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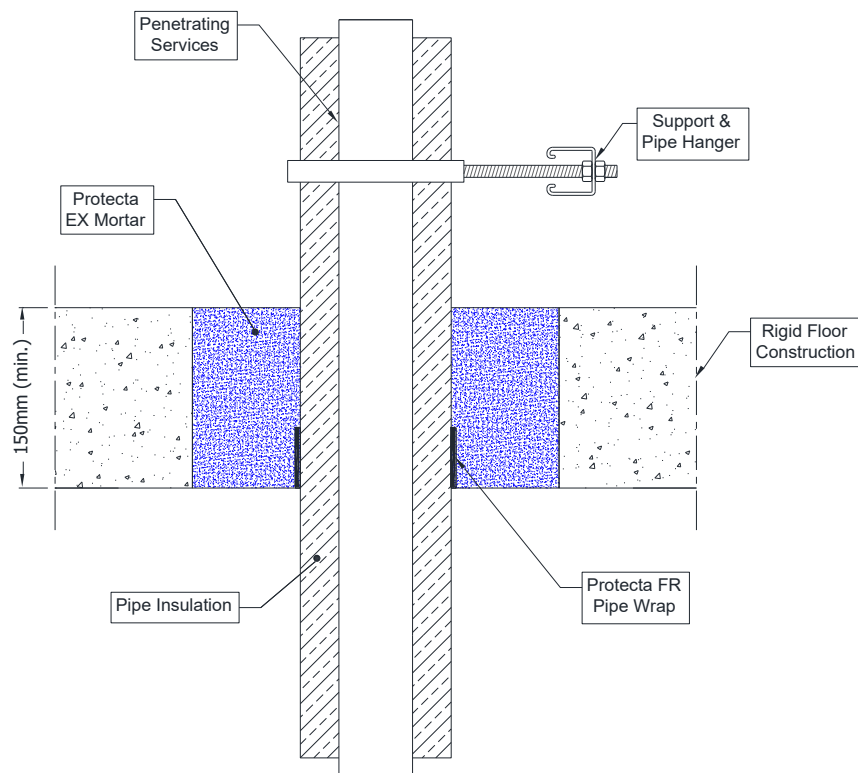
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Rigid floor constructions according to A.1.1 with floor thickness of minimum 150 mm

Protecta FR Pipe Wrap pipe penetration seal with 150 mm deep Protecta EX Mortar

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and 30 mm from other services), with min. 150 mm Protecta EX Mortar to either surface of the floor or anywhere between. Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation. Maximum seal size as section A.1.2).

Construction details:



Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
12 mm diameter/ 1.0 mm wall	1 off 50 x 1.8 mm Protecta FR Pipe Wrap, fitted at soffit	9 mm PE foam insulation	EI 180 C/U
Maximum 76 mm diameter/ 1.5-14.2 mm wall*	2 off 50 x 1.8 mm Protecta FR Pipe Wrap, fitted at soffit	9-30 mm PE foam insulation	E 180 C/U EI 60 C/U

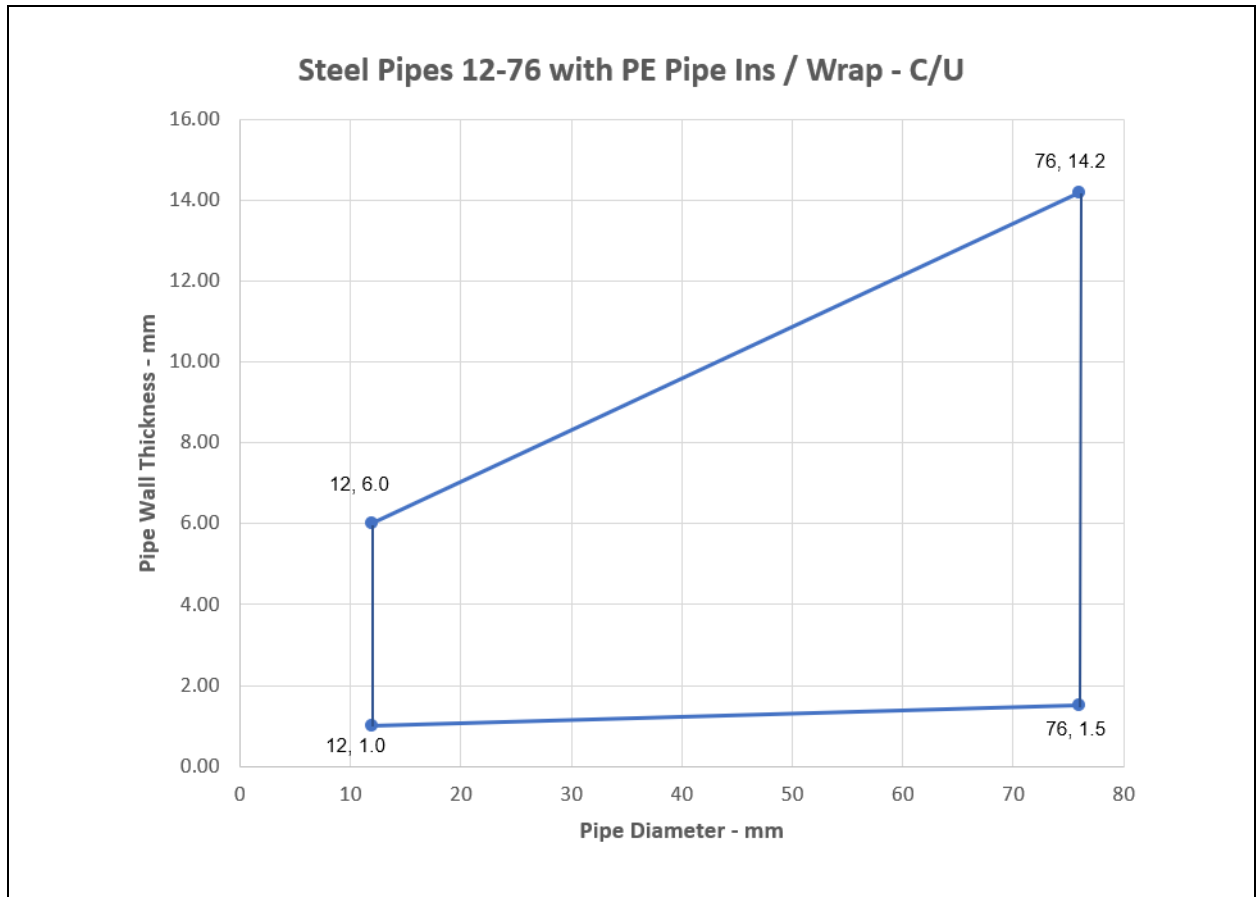
* See below graph for intermediate sizes



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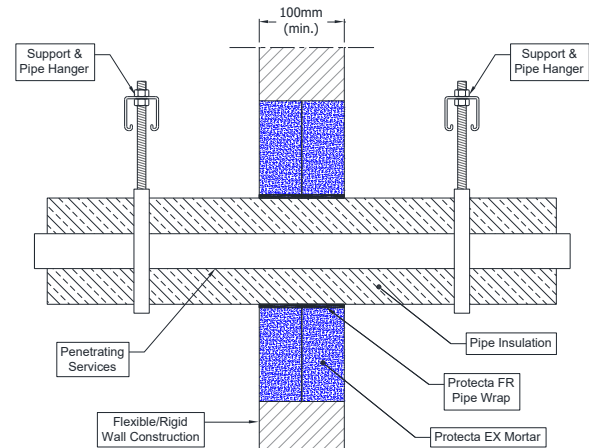
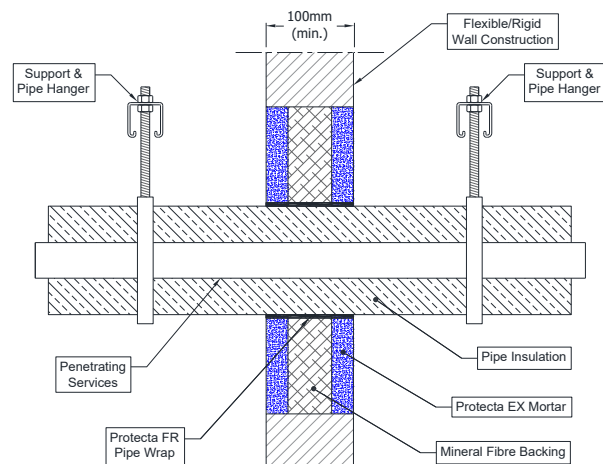
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Flexible and rigid wall constructions according to A.1.1 with wall thickness of min. 100 mm

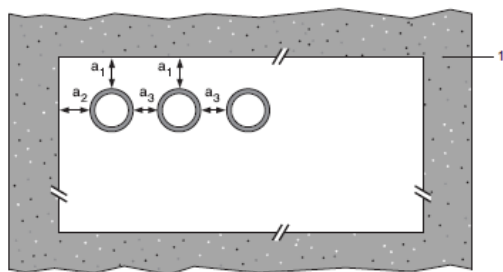
Protecta FR Pipe Wrap pipe penetration seal with 25 mm deep Protecta EX Mortar to both faces backed with 50 mm mineral fibre board

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture (min. separation 30 mm from seal edges), with min. 25 mm Protecta EX Mortar to both sides of the wall, backed with min. 1 x 50 mm or 2 x 25 mm stone wool board min. 150 kg/m³ or min. 50 mm Protecta EX Mortar to both sides of the wall without backing*. Protecta FR Pipe wraps are required to be fitted to both faces of the seal.

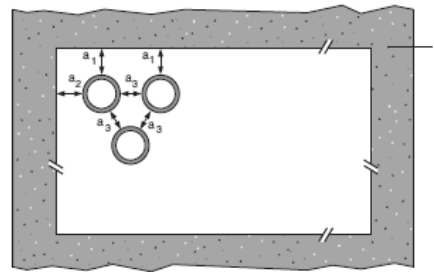
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation

* Maximum seal size as section A.1.2)



Solutions

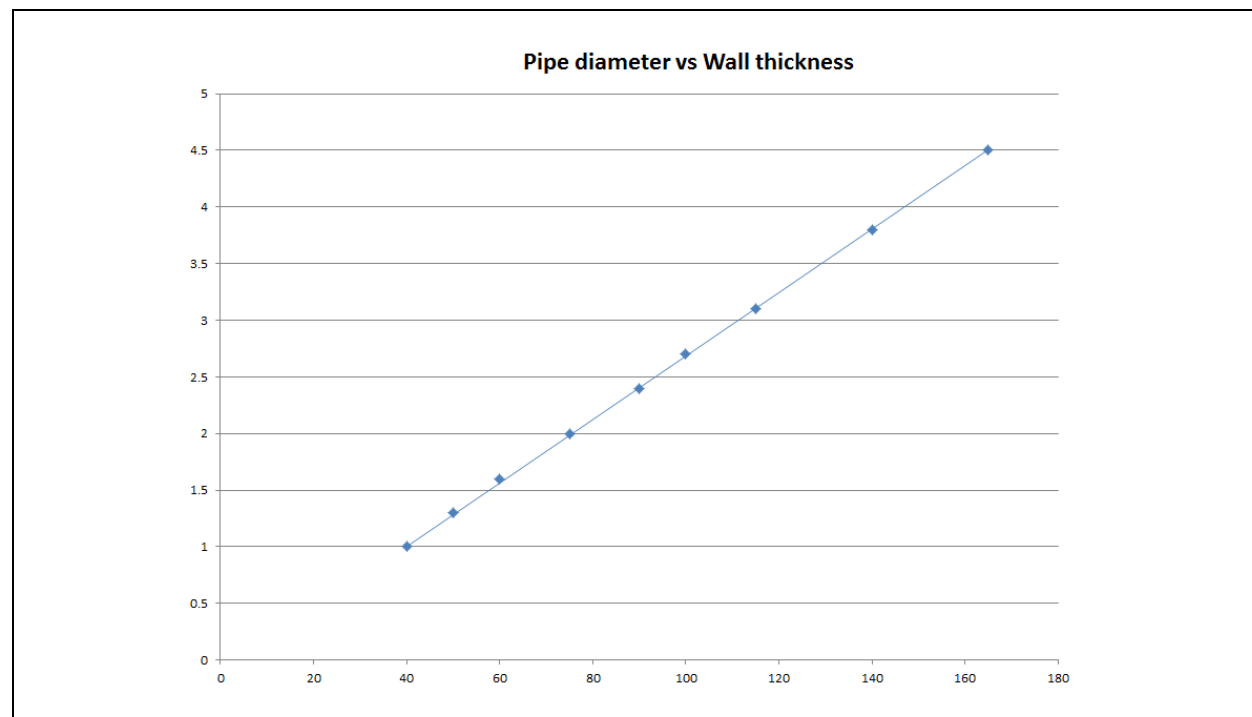
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Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
40 mm diameter/1-14.2 mm wall	2 off 50 x 1.8 mm Protecta FR Pipe Wrap, one fitted flush to each face of seal	13 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	EI 120 C/U
40 mm diameter/1-14.2 mm wall*	2 off 50 x 3.6 mm Protecta FR Pipe Wrap, 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*			

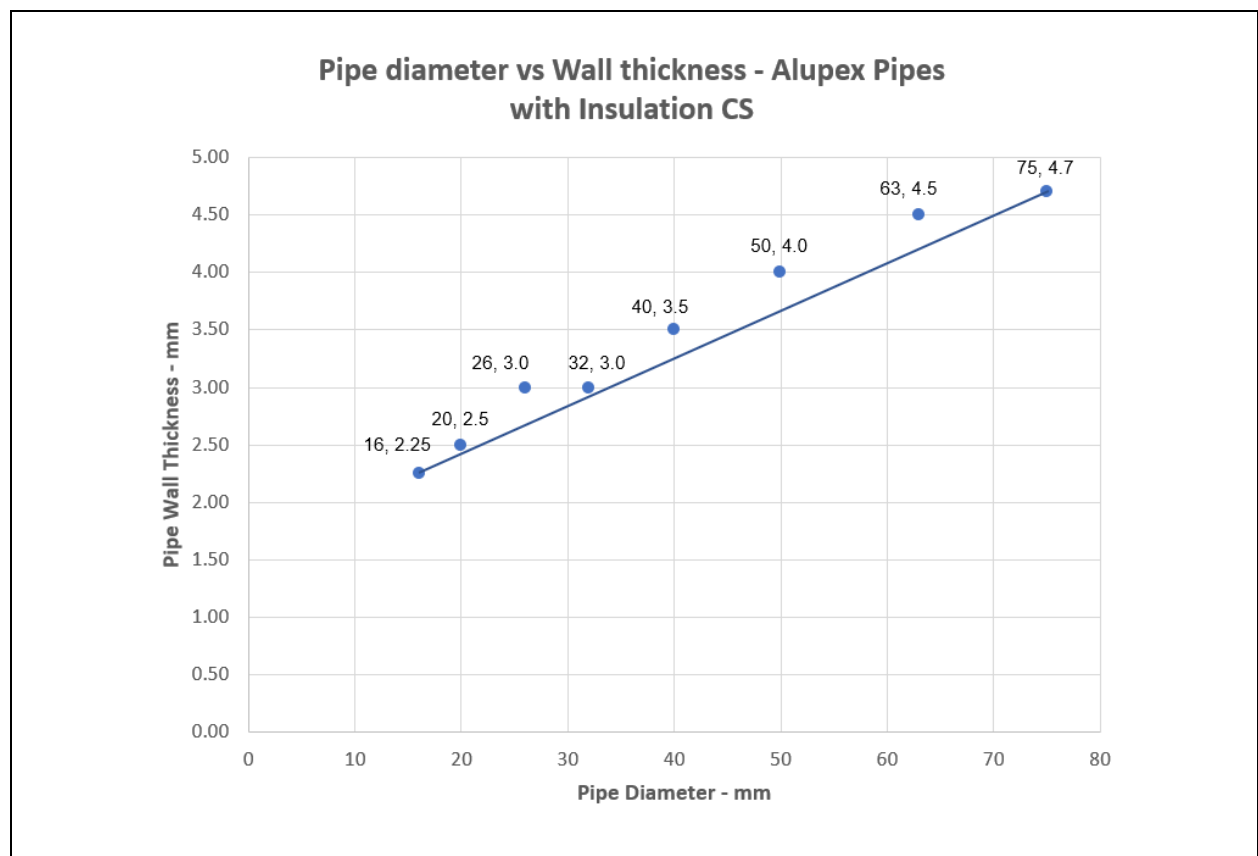
* Typical pipe diameters shown, see below graph for intermediate sizes



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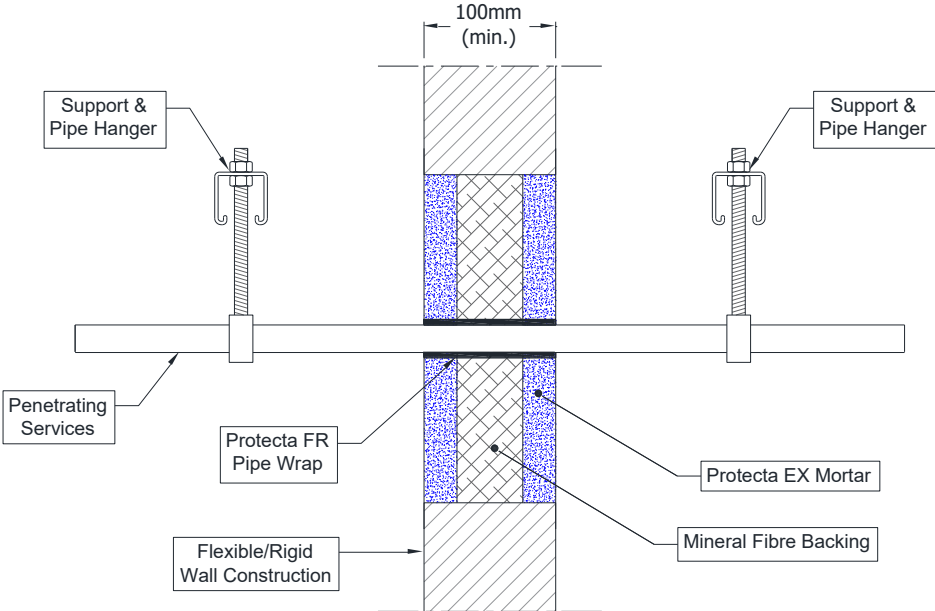
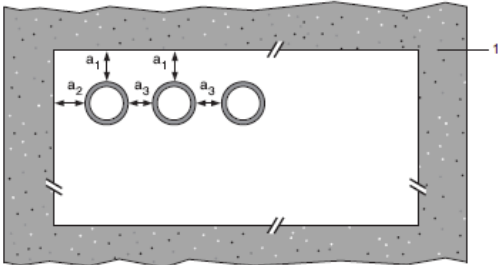
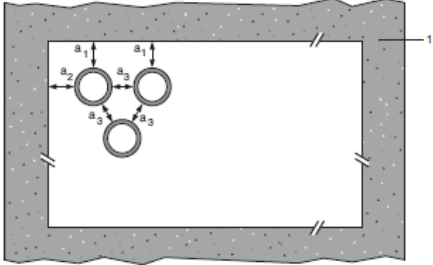
Services	Wrap	Insulation	Classification
Copper and steel pipes			
12-54 mm diameter/1-1.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9-25 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	EI 120 C/C
Alupex pipes			
16 mm diameter/2.25 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9-25 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam 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			

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



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Protecta FR Pipe Wrap pipe penetration seal with 25 mm deep Protecta EX Mortar to both faces backed with 50 mm mineral fibre board

Penetration Seal: Combustible pipes sealed with Protecta FR Pipe Wrap, installed into Protecta EX Mortar seals. Minimum separation between penetration seals and seal edges of 30 mm. Minimum seal size as section A.1.2).	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction a1 Pipe / top edge of seal separation a2 Pipe / side edge of seal separation a3 Pipe / pipe separation	

* Partition wall must incorporate a full fill core insulation of Stonewool (35kg/m³ density)



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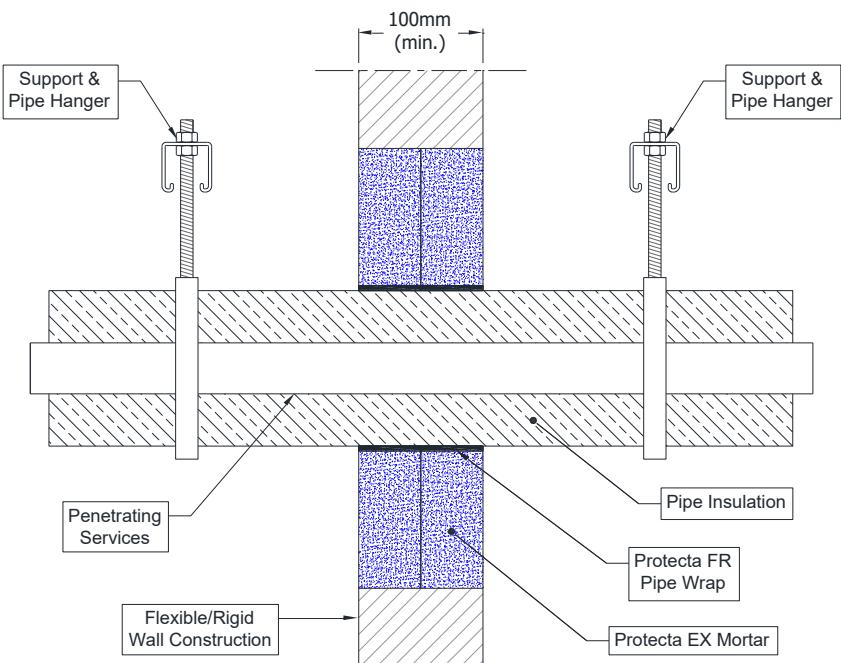
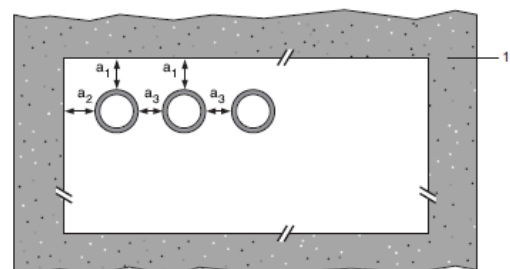
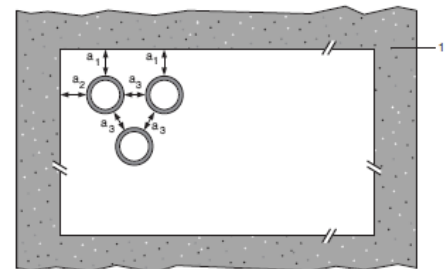
Double side penetration seal with pipes

Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1 and PVC-C according to EN 1566-1			
Diameter up to 40 mm, wall thickness 3.0 – 4.3 mm	50 x 1.8 mm (1 layer)	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+PVC and PP pipes in any combination	E 120 U/C, E 120 C/U, EI 60 U/C, EI 60 C/C
Diameter up to 110 mm, wall thickness 2.7 - 6.6 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 125 mm, wall thickness 3.7 – 7.4 mm	50 x 5.4 mm (3 x 1.8 layer)		EI 120 U/C, EI 120 C/C
Diameter up to 160 mm, wall thickness 3.2 - 9.5 mm	50 x 7.2 mm (4 x 1.8 layer)		EI 60 U/C, EI 60 C/C
PE pipes according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1			
Diameter up to 40 mm, wall thickness 3.2 – 3.7 mm	50 x 1.8 mm (1 layer)	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+PVC and PP pipes in any combination	EI 120 U/C, EI 120 C/C
Diameter up to 110 mm, wall thickness 4.2 - 10 mm	50 x 3.6 mm (2 x 1.8 layer)		EI 60 U/C, EI 60 C/C
Diameter up to 125 mm, wall thickness 12 mm	50 x 5.4 mm (3 x 1.8 layer)		EI 120 U/C, EI 120 C/C
Diameter up to 160 mm, wall thickness 4.9 – 12.0 mm	50 x 7.2 mm (4 x 1.8 layer)		E 120 U/C, E 120 C/C
Diameter up to 160 mm, wall thickness 12.0 mm			EI 90 U/C, EI 90 C/C
PP pipes according to EN 1852-1: 2009			
Diameter up to 40 mm, wall thickness 4.0 – 5.5 mm	50 x 1.8 mm (1 layer)	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+PVC and PP pipes in any combination	EI 120 U/C, EI 120 C/C
Diameter up to 110 mm, wall thickness 6.6 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 125 mm, wall thickness 17.1 mm	50 x 5.4 mm (3 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 160 mm, wall thickness 4.0 - 21.9 mm	50 x 7.2 mm (4 x 1.8 layer)		E 120 U/C, E 120 C/C
Diameter up to 160 mm, wall thickness 21.9 mm			EI 60 U/C, EI 60 C/C



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Protecta FR Pipe Wrap pipe penetration seal with 50 mm deep Protecta EX Mortar 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), min. 50 mm Protecta EX Mortar to both sides of the wall without backing*. Protecta FR Pipe wraps are required to be fitted to both faces of the seal.	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction a1 Pipe / top edge of seal separation a2 Pipe / side edge of seal separation a3 Pipe / pipe separation	

* Maximum seal size as section A.1.2)

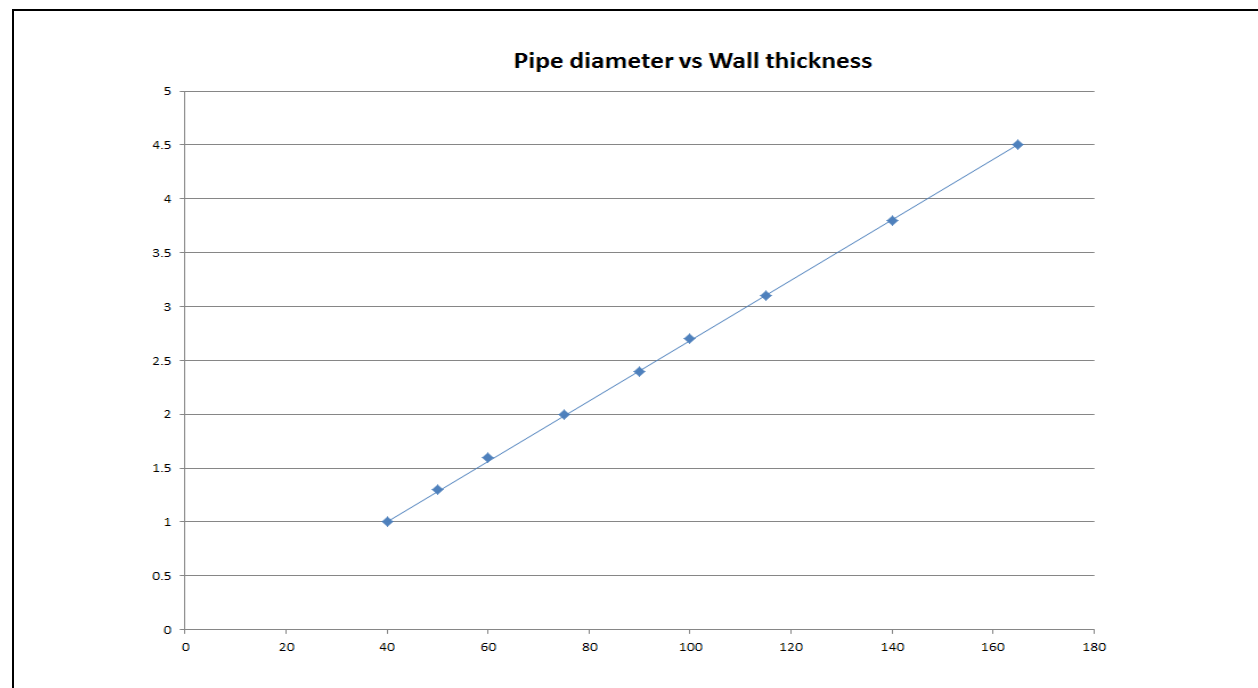


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Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe	2 off 50 x 3.6 mm Protecta FR Pipe Wrap, one fitted flush to each face of seal	13 -32 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	E 120 C/U, EI 60 C/U
40 mm diameter/1-14.2 mm wall*			
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



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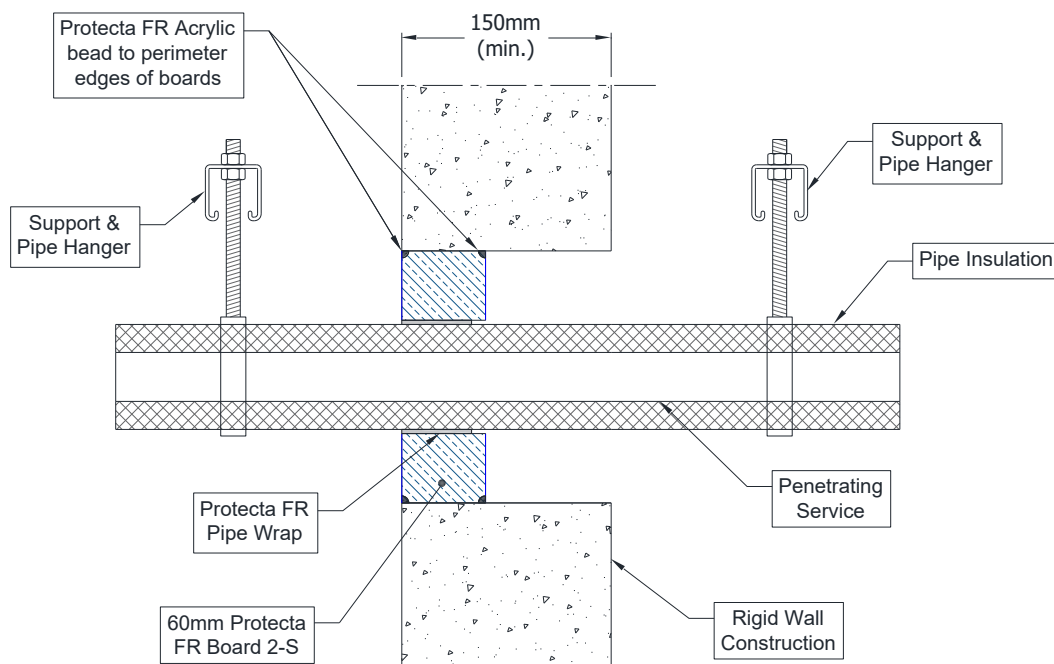
Protecta FR Pipe Wrap Used in Conjunction with Protecta FR Board

Rigid wall constructions according to B.1.1

Protecta FR Pipe Wrap pipe penetration seal with 1x Protecta FR Board 2-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 60 mm Protecta FR Board 2-S to either side of the wall (or anywhere in between). Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation. Minimum separation and maximum aperture according to section B.1.2.

Construction details:



Single side penetration seal with pipes in minimum 150 mm thick walls

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
165 mm diameter/ 4.5-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted centrally	9-25 mm elastomeric insulation min. class B-s3, d0	E 120 U/C, E 120 C/U, E 120 C/C, EI 45 U/C, EI 45 C/U, EI 45 C/C
40-219 mm diameter*	Not required	30 mm stone wool min. 80 kg/m ³	E 240 U/C, E 240 C/U, E 240 C/C, EI 60 U/C, EI 60 C/U, EI 60 C/C
40-219 mm diameter*		30-50 mm stone wool min. 80 kg/m ³	E 180 U/C, E 180 C/U, E 180 C/C, EI 60 U/C, EI 60 C/U, EI 60 C/C
40-325 mm diameter*		50 mm stone wool min. 80 kg/m ³	E 180 U/C, E 180 C/U, E 180 C/C, EI 60 U/C, EI 60 C/U, EI 60 C/C

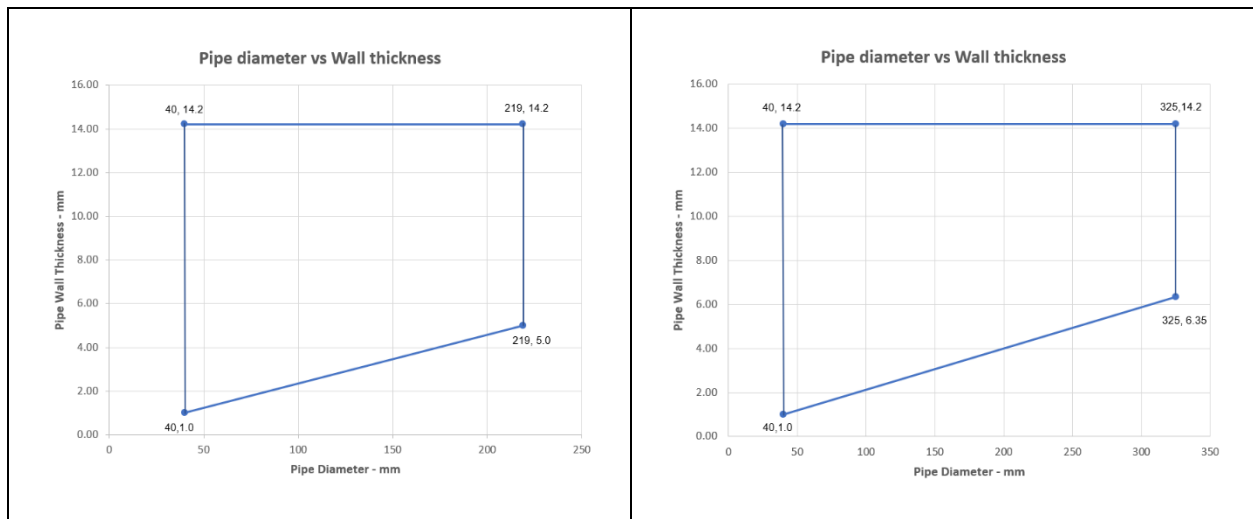
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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Single side penetration seal with pipes in minimum 75 mm thick walls

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
165 mm diameter/ 4.5-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted centrally	9-25 mm elastomeric insulation min. class B-s3, d0	E 120 U/C, E 120 C/U, E 120 C/C, EI 45 U/C, EI 45 C/U, EI 45 C/C



Solutions

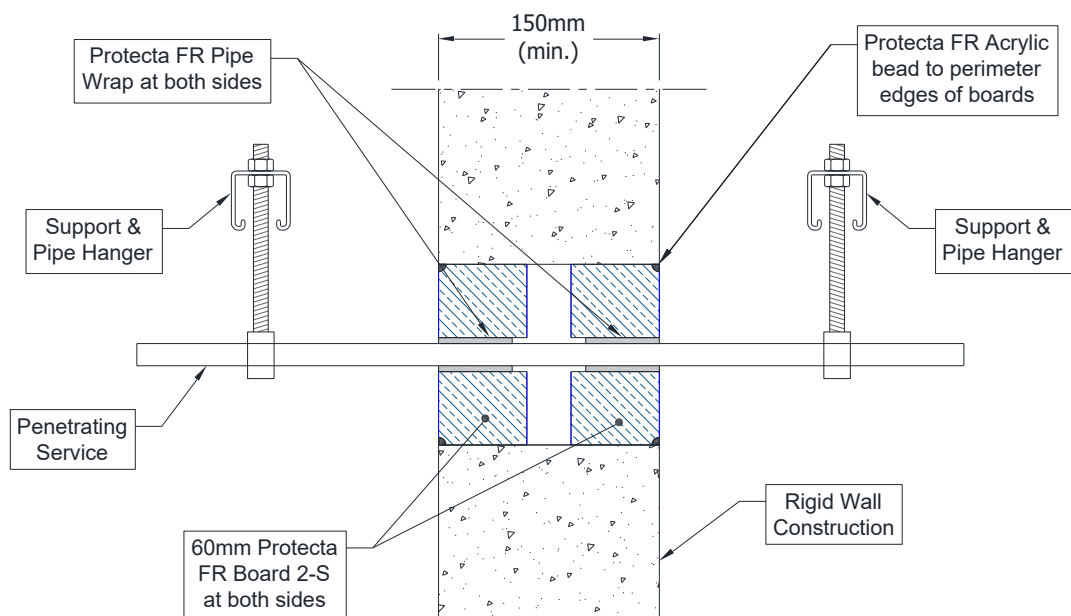
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Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 2-S

Penetration Seal: Plastic and metal pipes fitted at any position within the aperture, with 60 mm Protecta FR Board 2-S to both sides of the wall. Protecta FR Pipes Wraps may be required to be fitted around pipes. Minimum separation and maximum aperture according to section B.1.2.

Construction details:



Double side penetration seal with pipes

Services	Wrap	Classification
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1 and PVC-C according to EN 1566-1		
Up to 40 mm diameter / 1.9-3.0 mm wall	50 x 1.8 mm	EI 240 U/C
Up to 110 mm diameter / 2.7-6.6 mm wall	50 x 3.6 mm	
Up to 125 mm diameter / 4.7-7.4 mm wall	50 x 7.2 mm	
Up to 160 mm diameter / 4.0-9.5 mm wall*	50 x 10.8 mm	
Up to 200 mm diameter / 4.9-11.9 mm wall*	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter/7.7-12.1 mm wall thickness*#	75 x 18 mm	EI 120 C/C
Up to 400 mm diameter/9.8-15.3 mm wall thickness*#	75 x 28.8 mm	EI 120 C/C
Diameter up to 32 mm Ø, wall thickness 1.0-2.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 U/C
Diameter up to 110 mm, wall thickness 1.0–6.6 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C



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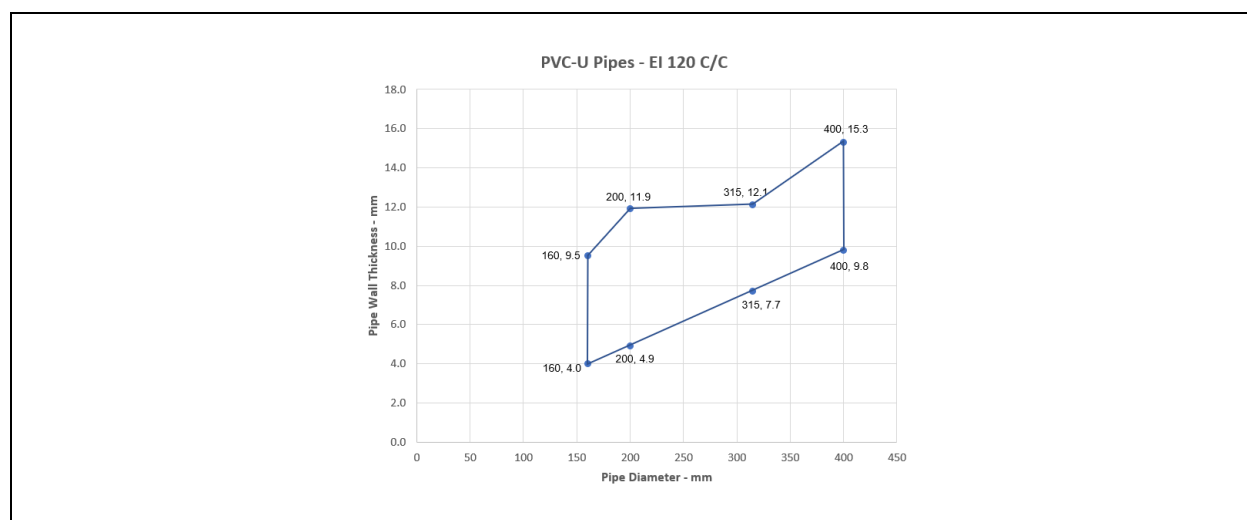
Services	Wrap	Classification
PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1		
Up to 40 mm diameter / 2.4-4.6 mm wall	50 x 1.8 mm	EI 240 U/C
Up to 110 mm diameter / 3.4-10.0 mm wall	50 x 3.6 mm	
Up to 125 mm diameter / 3.9-7.4 mm wall	50 x 7.2 mm	
Up to 160 mm diameter / 4.9-9.5 mm wall	50 x 10.8 mm	
Up to 200 mm diameter / 4.9-18.2 mm wall	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter / 18.7-28.5 mm wall	75 x 18.0 mm	E 180 C/C, EI 60 C/C
Up to 315 mm diameter / 28.6 mm wall	75 x 18.0 mm	E 180 C/C, EI 120 C/C
Up to 400 mm diameter / 9.8-36.2 mm wall	75 x 28.8 mm	EI 30 C/C
Up to 400 mm diameter / 36.3 mm wall	75 x 28.8 mm	EI 120 C/C
Diameter up to 32 mm Ø, wall thickness 2.0-4.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 C/U
Diameter up to 110 mm, wall thickness 2.0–10.0 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C
PP pipe according to EN 1451-1		
Up to 40 mm diameter / 1.8-5.5 mm wall	50 x 1.8 mm	EI 240 U/C
Up to 110 mm diameter / 2.7-10.0 mm wall	50 x 3.6 mm	EI 240 C/C
Up to 125 mm diameter / 3.1-11.4 mm wall	50 x 7.2 mm	
Up to 160 mm diameter / 4.9-14.6 mm wall	50 x 10.8 mm	
Up to 200 mm diameter / 4.9-18.2 mm wall	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter / 28.6 mm wall	75 x 18.0 mm	EI 30 C/C
Diameter up to 32 mm Ø, wall thickness 1.8-4.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 C/U
Diameter up to 110 mm, wall thickness 1.8–10.0 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C

¹⁾ PVC, PE and PP pipes can be mixed in the same bundle.

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

Configuration 1 & 2

^Sealed with a bead of Protecta FR Acrylic applied flush to the pipe and batt on the outer faces of the board



Solutions

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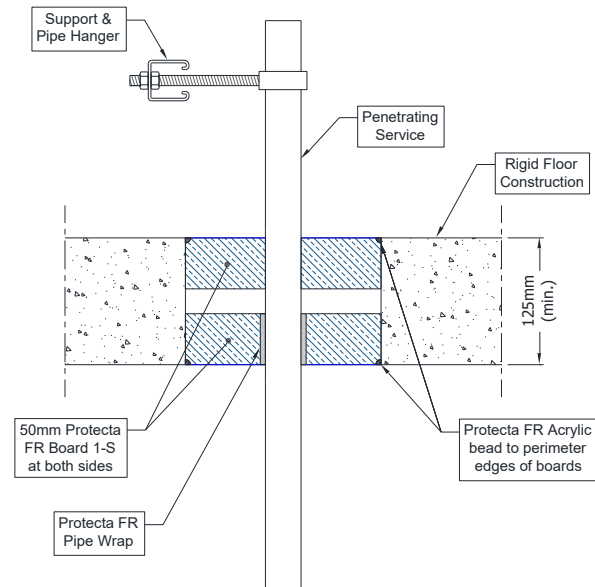
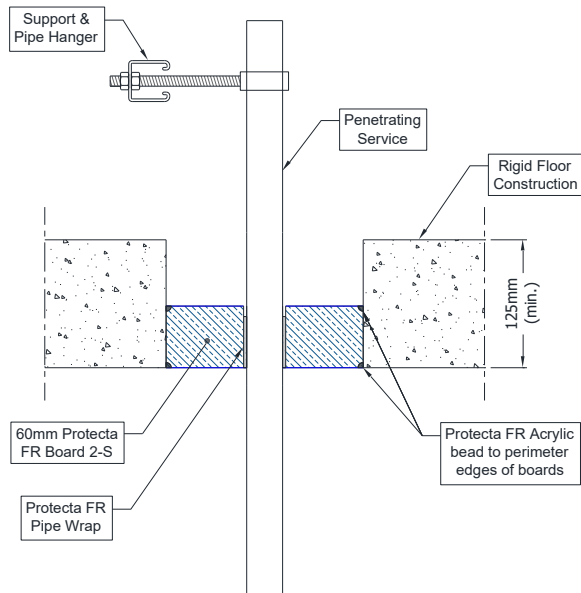
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Rigid floor constructions according to B.1.1 with floor thickness of minimum 125 mm

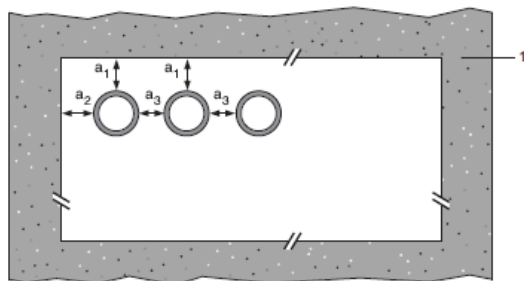
Protecta FR Pipe Wrap penetration seal for plastic pipes, in Protecta FR Board

Penetration Seal: Combustible pipes sealed with Protecta FR Board, positioned to either face of the floor (or anywhere in between). Minimum separation and maximum aperture according to section B.1.2 (Configuration 1 & 2).

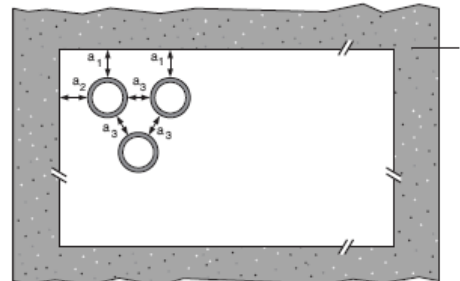
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



Solutions

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Services	Wrap (soffit side)	FR Board configuration	Classification
PVC pipes according to 2.6)			
Diameter up to 40 mm, wall thickness 1.9 – 3.0 mm*	50 x 1.8 mm (1 layer)	Single 2-S 60 mm	E 120 U/C, EI 60 U/C
Diameter up to 110 mm, wall thickness 2.7 - 6.6 mm*	50 x 3.6 mm (2 x 1.8 layer)		EI 60 U/C
Diameter up to 160 mm, wall thickness 4.0 – 9.5 mm	50 x 10.8 mm (6 x 1.8 layer)	Double 1-S 50 mm	EI 60 C/C
PE pipes according to 2.6)			
Diameter up to 40 mm, wall thickness 2.4 – 3.7 mm*	50 x 1.8 mm (1 layer)	Single 2-S 60 mm	EI 60 U/C
Diameter up to 110 mm, wall thickness 3.4 – 10.0 mm*	50 x 3.6 mm (2 x 1.8 layer)		EI 60 U/C
Diameter up to 160 mm, wall thickness 4.9 - 14.6 mm*	50 x 10.8 mm (6 x 1.8 layer)	Double 1-S 50 mm	EI 60 C/C
PP pipes according to 2.6)			
Diameter up to 40 mm, wall thickness 1.8 – 5.5 mm*	50 x 1.8 mm (1 layer)	Single 2-S 60 mm	EI 60 U/C
Diameter up to 110 mm, wall thickness 2.7 – 10.0 mm*	50 x 3.6 mm (2 x 1.8 layer)		EI 60 C/C
Diameter up to 160 mm, wall thickness 4.9 - 14.6 mm*	50 x 10.8 mm (6 x 1.8 layer)	Double 1-S 50 mm	EI 60 C/C
Aquatherm green MF pipes according to 2. 6)			
Diameter up to 20 mm, wall thickness 2.8 mm	50 x 1.8 mm (1 layer)	Single 2-S 60 mm	E 120 C/C, EI 60 C/C
Diameter up to 110 mm, wall thickness 2.8 – 15.1 mm*	50 x 3.6 mm (2 x 1.8 layer)		E 120 C/C, EI 60 C/C
Diameter 110 mm, wall thickness 15.1 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 C/C, EI 90 C/C
Geberit Silent PP pipes according to 2. 6)			
Diameter up to 50 mm, wall thickness 1.8 mm*	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 120 U/U, EI 60 U/U
Diameter up to 110 mm, wall thickness 1.8 – 3.0 mm*			E 120 U/C, EI 60 U/C
Diameter up to 160 mm, wall thickness 3.0 – 4.9 mm*	50 x 10.8 mm (6 x 1.8 layer)	Double 1-S 50 mm	E 120 U/C, EI 60 U/C
Diameter 160 mm, wall thickness 4.9 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 120 U/C

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



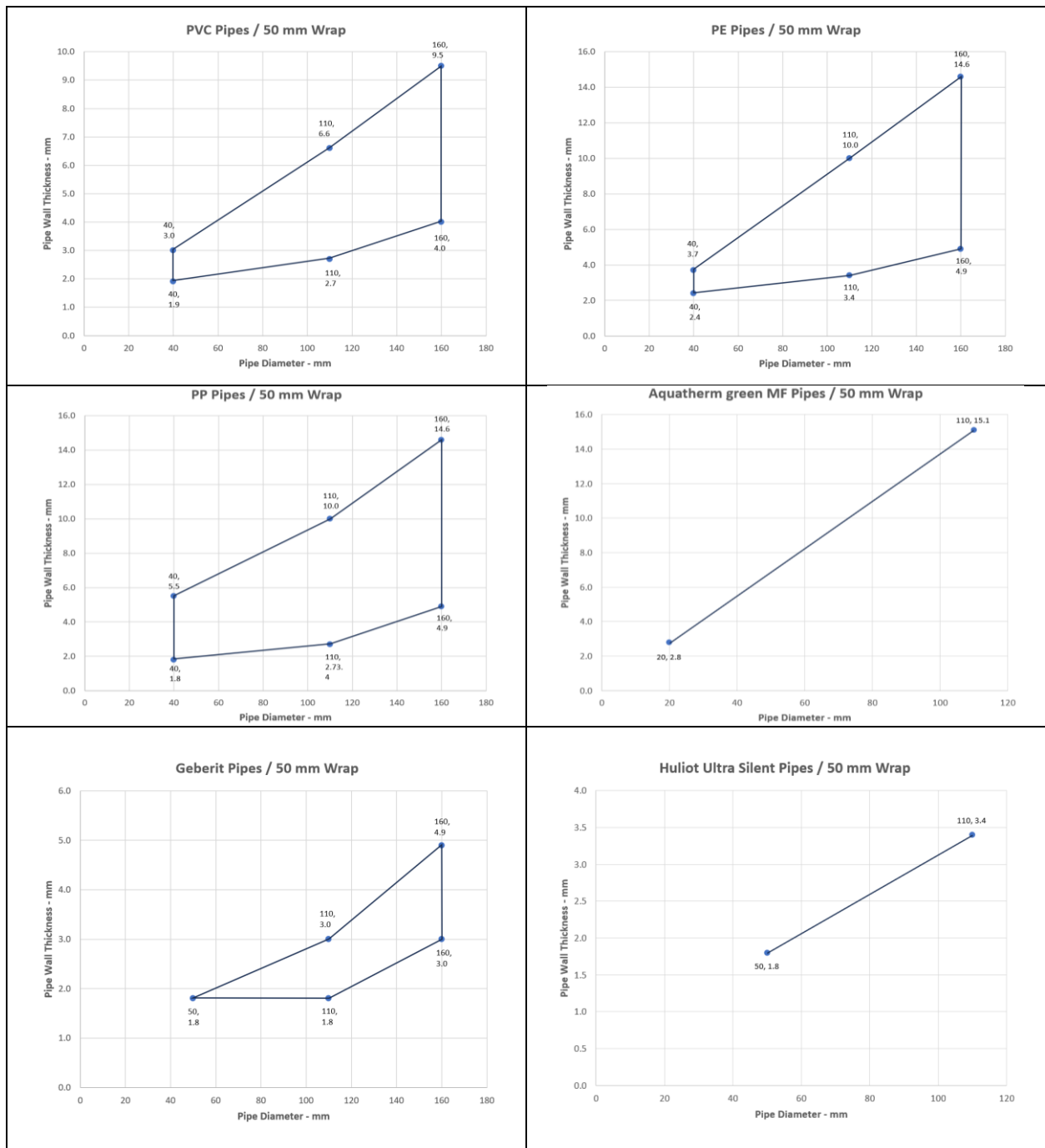
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Services	Wrap	FR Board	Classification
Huliot Ultra Silent pipes according to 2. 6)	(soffit side)	configuration	
Diameter up to 50 mm, wall thickness 1.8 mm	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 120 U/U, EI 60 U/U
Diameter up to 110 mm, wall thickness 1.8 – 3.4 mm*	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 60 U/C
Diameter 110 mm, wall thickness 3.4 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 90 U/C
POLO-KAL NG pipes according to 2. 6)			
Diameter 110 mm, wall thickness 3.4 mm	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 90 U/C, EI 60 U/C
Diameter 125 mm, wall thickness 5.3 mm	50 x 7.2 mm (4 x 1.8 layer)	Double 1-S 50 mm	EI 120 U/C
Diameter 160 mm, wall thickness 7.5 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 120 U/C
Rehau Raupiano Plus pipes according to 2. 6)			
Diameter up to 50 mm, wall thickness 1.9 mm	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 120 U/U, EI 60 U/U
Diameter up to 110 mm, wall thickness 1.9 – 2.8 mm*	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 60 U/C
Diameter 110 mm, wall thickness 2.8 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 90 U/C
Uponor Decibel pipes according to 2. 6)			
Diameter up to 50 mm, wall thickness 2.0 mm*	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 120 U/U, EI 90 U/U
Diameter up to 110 mm, wall thickness 2.0 – 3.8 mm*	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 90 U/C
Wavin AS+ pipes according to 2. 6)			
Diameter up to 50 mm, wall thickness 3.0 mm*	50 x 3.6 mm (2 x 1.8 layer)	Single 2-S 60 mm	E 120 U/U, EI 60 U/U
Diameter up to 110 mm, wall thickness 3.0 – 5.2 mm*	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 60 U/C
Diameter 110 mm, wall thickness 5.2 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, EI 90 U/C

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



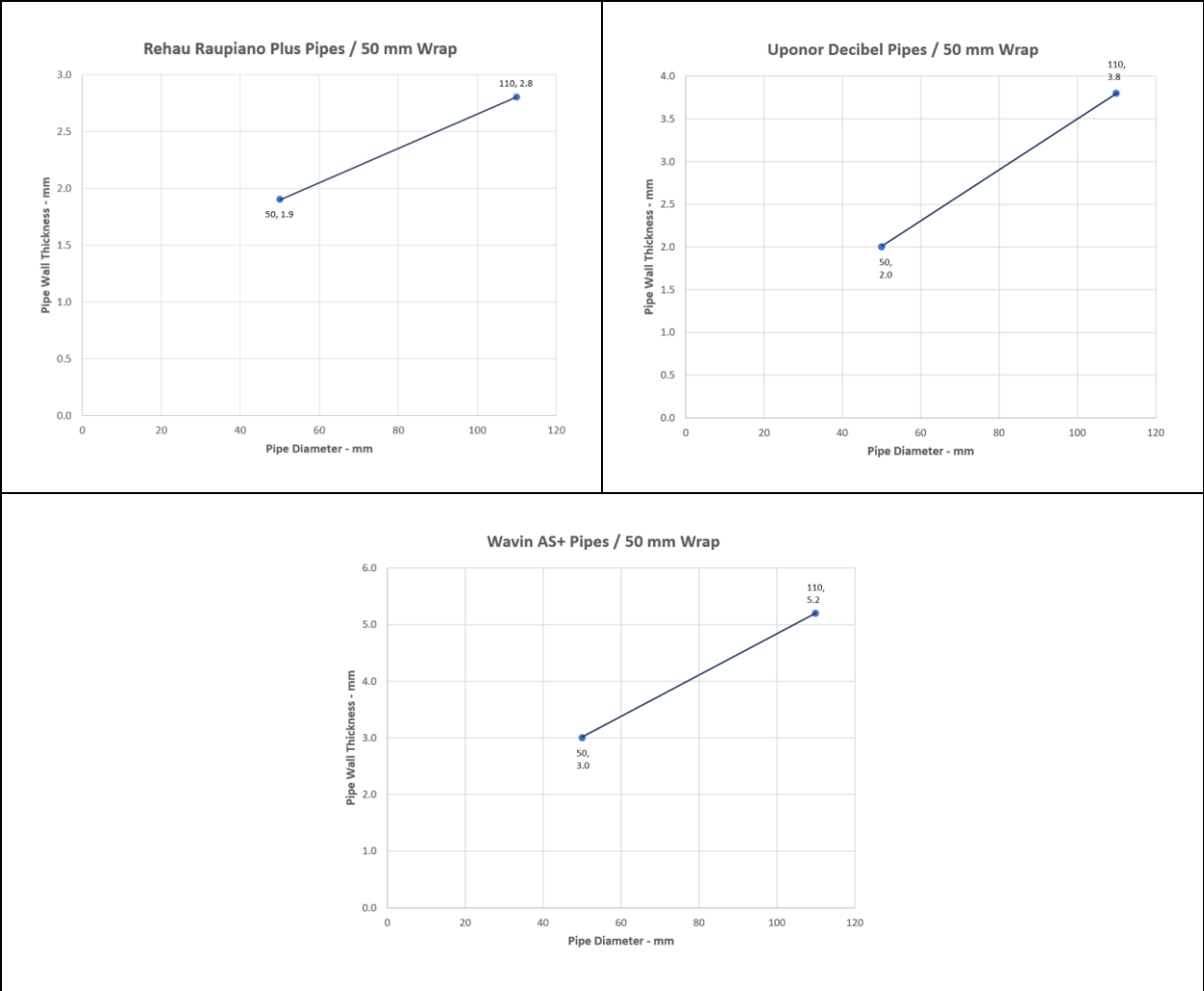
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Solutions

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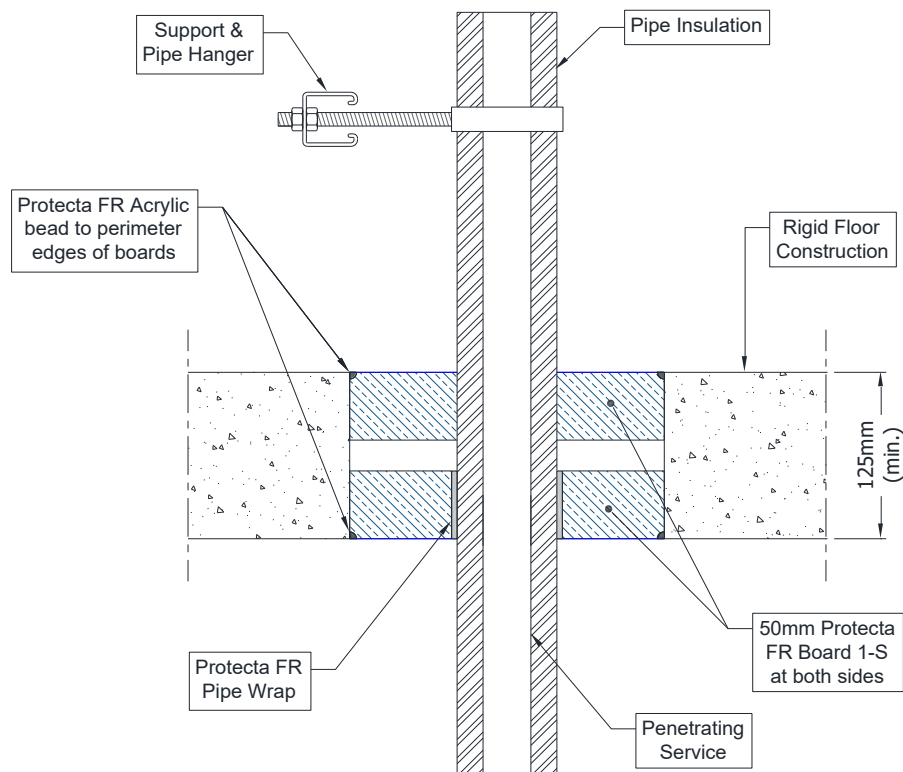


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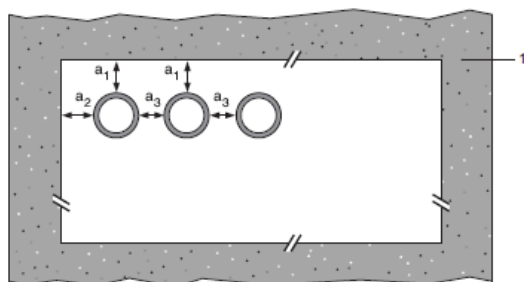
Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 1-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 50 mm Protecta FR Board 1-S to both sides of the floor. Minimum separation and maximum aperture according to section B.1.2 (Configuration 1 & 2). Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation.

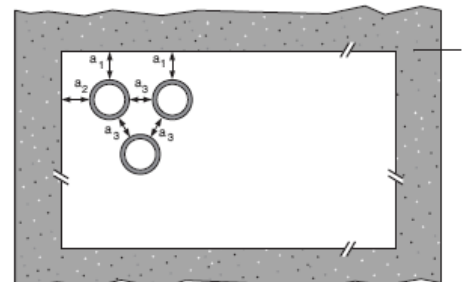
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



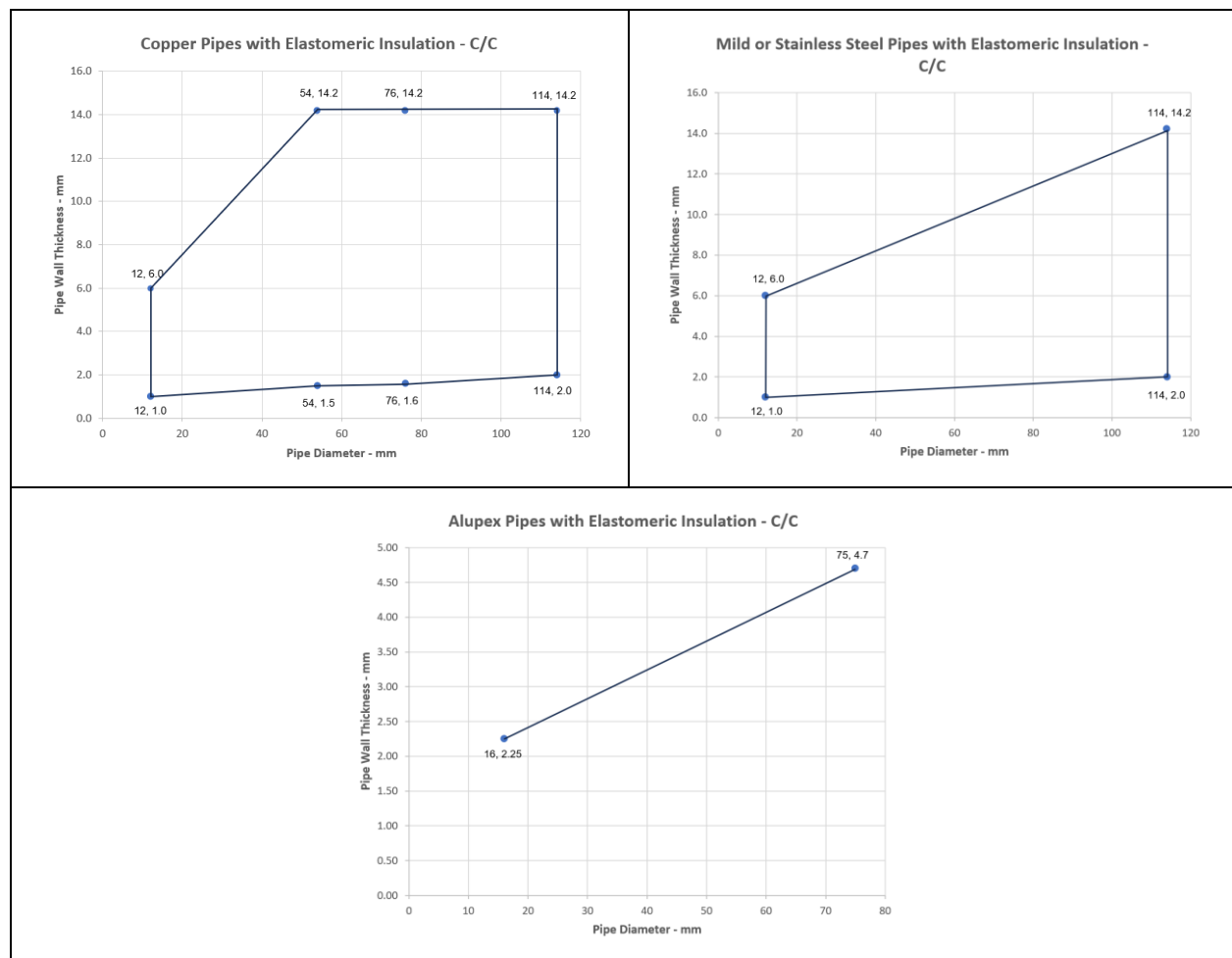
Solutions

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Services	Wrap	Insulation	Classification
Up to 54 mm diameter Copper pipe 1.0-14.2 mm wall*	50 x 3.6 mm Protecta FR Pipe Wrap fitted at bottom of seal	13-25 mm elastomeric insulation min. class B-s3, d0	E 90 C/C, EI 60 C/C
Up to 76 mm diameter mild or stainless Steel pipe 1.0-14.2 mm wall*			E 90 C/C, EI 60 C/C
Up to 114 mm diameter mild or stainless Steel pipe 1.0-14.2 mm wall*		25 mm elastomeric insulation min. class B-s3, d0	E 90 C/C, EI 60 C/C
Up to 16 mm diameter Alupex pipe 2.25 mm wall		13 mm elastomeric insulation min. class B-s3, d0	E 180 C/C, EI 120 C/C
Up to 75 mm diameter Alupex pipe 2.25-4.7 mm wall*		13-25 mm elastomeric insulation min. class B-s3, d0	EI 90 C/C

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



Solutions

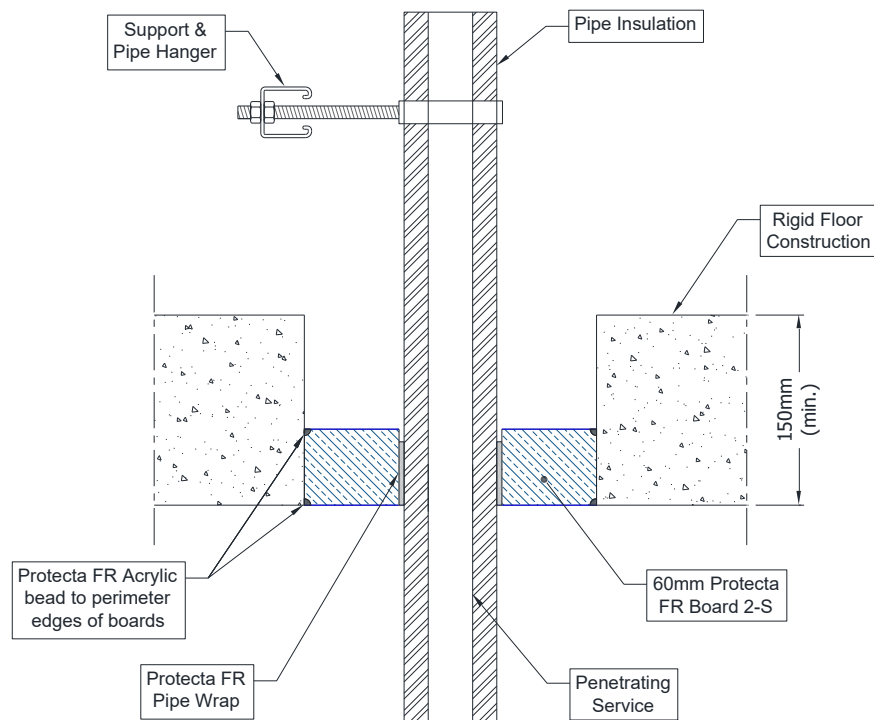
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Protecta FR Pipe Wrap pipe penetration seal with 1x Protecta FR Board 2-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 60 mm Protecta FR Board 2-S to either side of the floor (or anywhere in between). Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation. Maximum aperture size 2400 mm x 1200 mm

Construction details:



Single side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
165 mm diameter/ 4.5-14.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted at bottom of seal	13 mm elastomeric insulation min. class B-s3, d0	E 90 C/U, EI 45 C/U
		19 mm elastomeric insulation min. class B-s3, d0	EI 90 C/U



Solutions

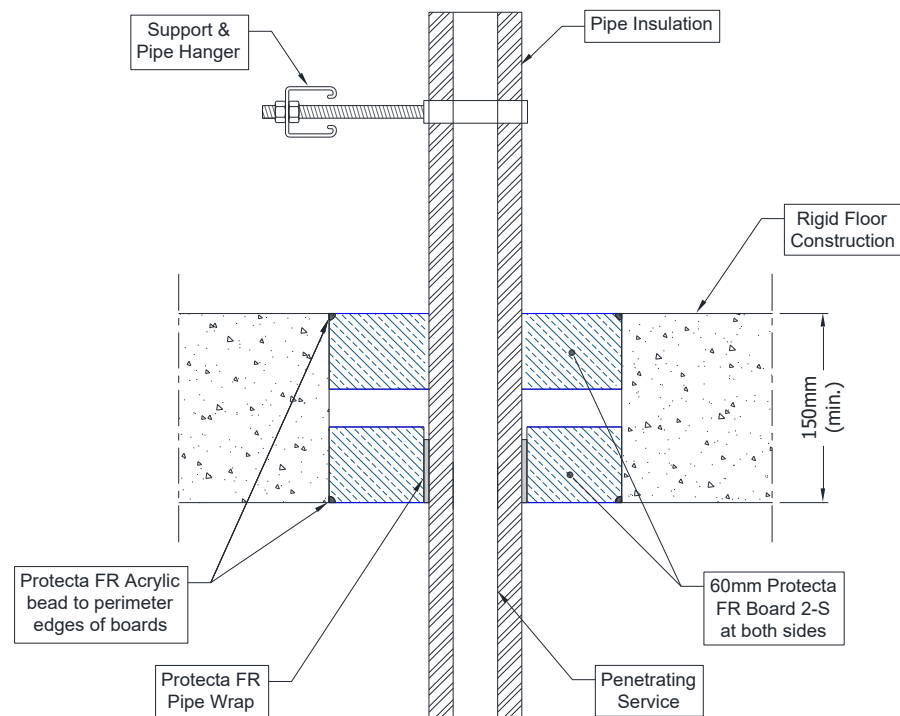
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Appendix UL-EU CERTIFICATE UL-EU-00915-EN

Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 2-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 60 mm Protecta FR Board 2-S to both sides of the floor. Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation at the soffit. Maximum aperture size 2400 mm x 1200 mm

Construction details:



Double side penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
Up to 40 mm diameter/ 1-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap	13 mm elastomeric insulation min. class B-s3, d0	E 180 C/U, EI 120 C/U



Solutions

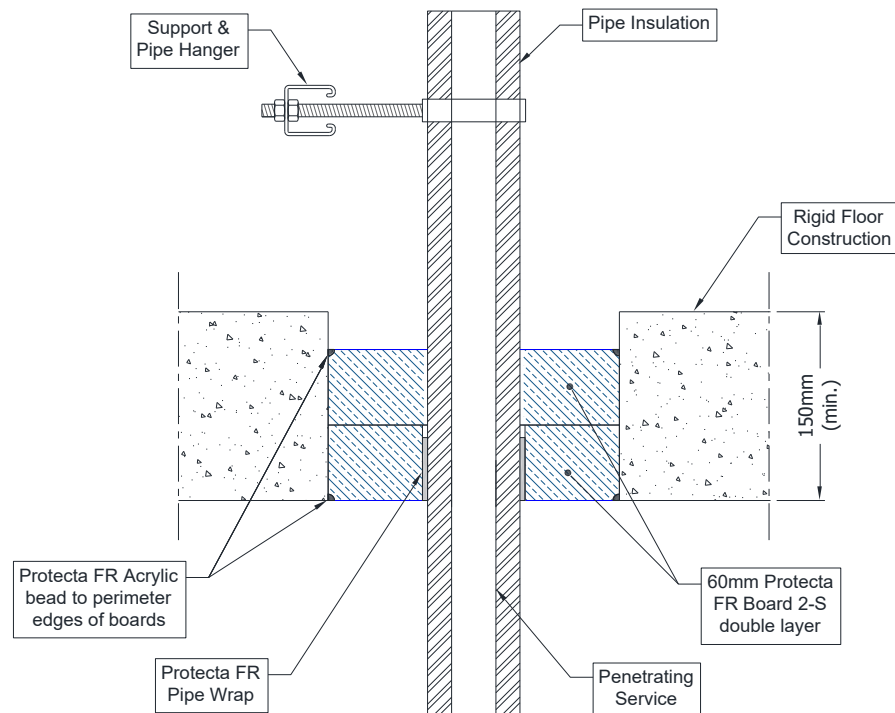
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Appendix UL-EU CERTIFICATE UL-EU-00915-EN

Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 2-S (back to back)

Penetration Seal: CS (Continuous Sustained) insulated metallic and composite pipes fitted at any position within the aperture, with two layers of 60 mm Protecta FR Board 1-S installed together to either side of the floor (or anywhere in between). Protecta FR Pipes Wraps are required to be fitted around combustible pipe insulation at the bottom of the seal. Maximum aperture size 2400 mm x 1200 mm

Construction details:



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Back to back penetration seal with pipes

Services	Wrap	Insulation	Classification
Copper pipe			
12-54 mm diameter/1-1.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the bottom of the seal	9-13 mm elastomeric insulation min. class B-s3, d0	E240 C/C, EI 60 C/C
12-54 mm diameter/1-1.2 mm wall		13-25 mm elastomeric insulation min. class B-s3, d0	E 180 C/C, EI 45 C/C
Geberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)			
16 mm diameter/2.25 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the bottom of the seal	9 mm elastomeric insulation min. class B-s3, d0	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			
16 mm diameter/2.25 mm wall		13-25 mm elastomeric insulation min. class B-s3, d0	E 60 C/C, EI 45 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			

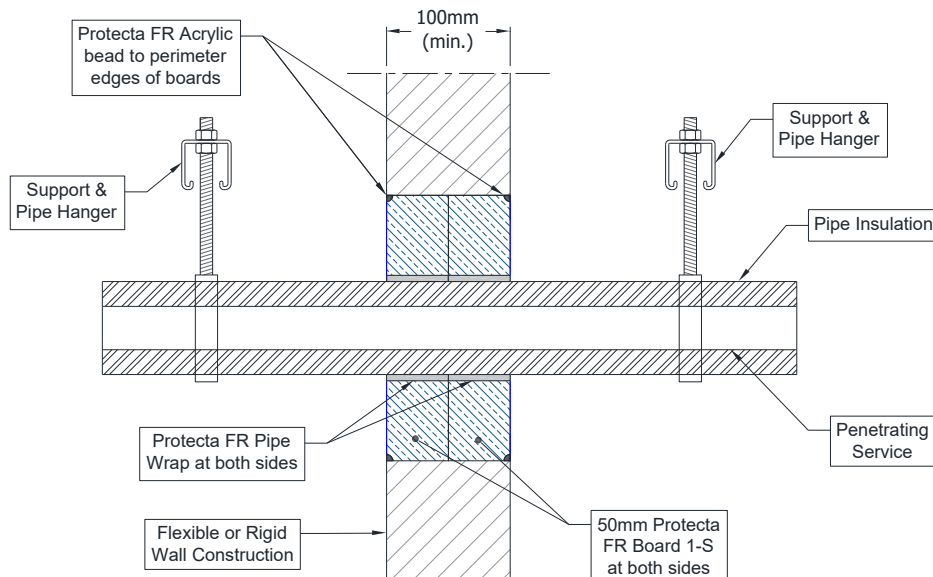


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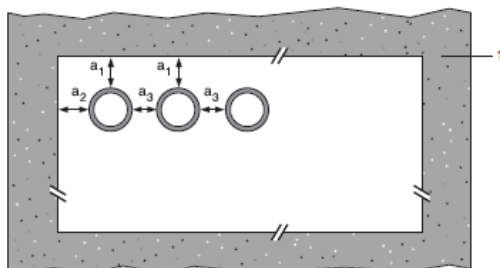
Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 1-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 50 mm Protecta FR Board 1-S to both sides of the wall. Protecta FR Pipes Wraps are required to be fitted around the pipe insulation. Minimum separation and maximum aperture according to section B.1.2 (Configuration 1 & 2).

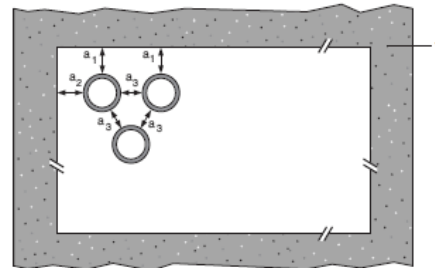
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



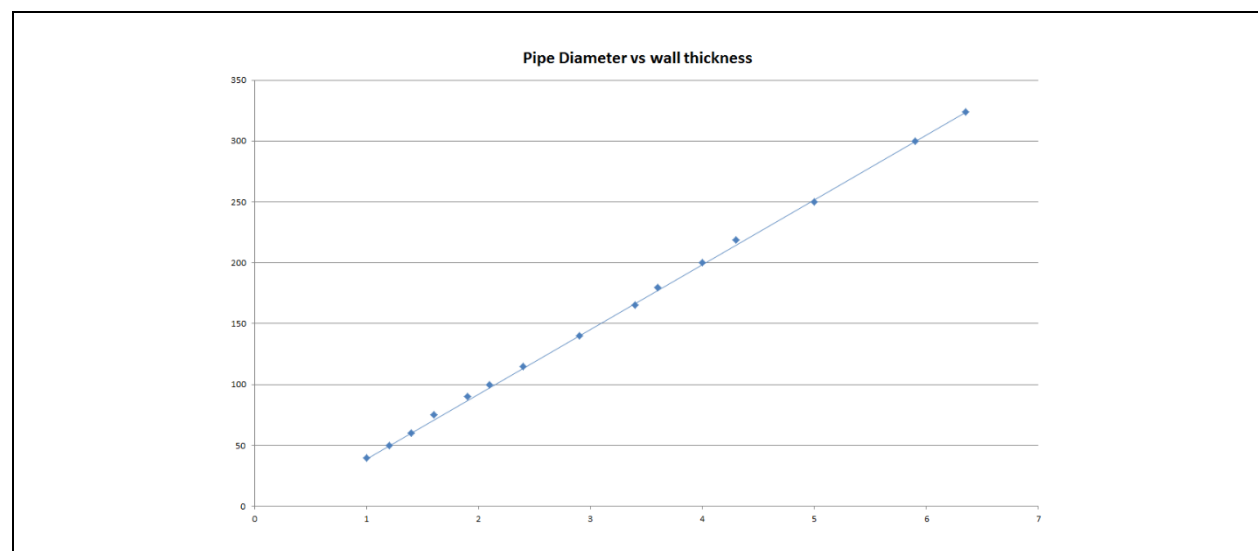
Solutions

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Double side penetration seal with pipes

Services	Insulation	Protecta FR Wrap	Classification
Mild or stainless steel pipe	32-50 mm thick Elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	3 layers 50 x 1.8 mm	EI 90 C/U
40 mm diameter/1-14.2 mm wall*			
50 mm diameter/1.2-14.2 mm wall*			
60 mm diameter/1.4-14.2 mm wall*			
75 mm diameter/1.6-14.2 mm wall*			
90 mm diameter/1.9-14.2 mm wall*			
100 mm diameter/2.1-14.2 mm wall*			
115 mm diameter/2.4-14.2 mm wall*			
140 mm diameter/2.9-14.2 mm wall*			
165 mm diameter/ 3.4-14.2 mm wall*			
180 mm diameter/ 3.6-14.2 mm wall*			
200 mm diameter/ 4.0-14.2 mm wall*			
219 mm diameter/ 4.3-14.2 mm wall*			
250 mm diameter/ 5.0-14.2 mm wall*			
300 mm diameter/ 5.9-14.2 mm wall*			
324 mm diameter/ 6.35-14.2 mm wall*			

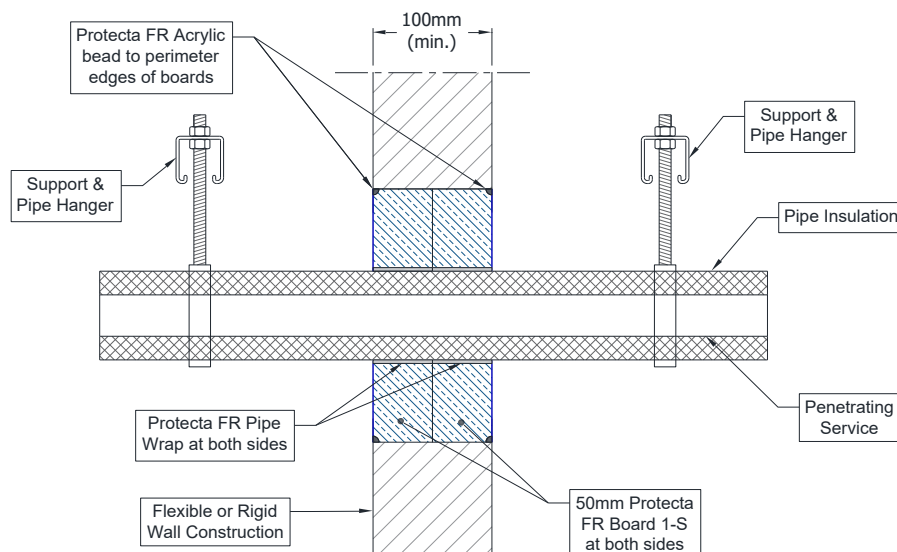
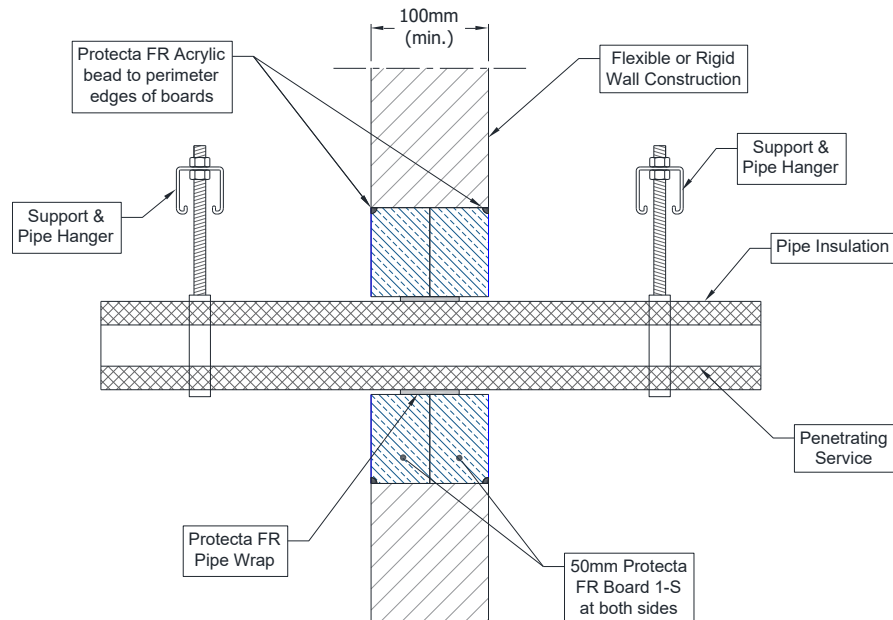


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Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 1-S

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes fitted at any position within the aperture, with 50 mm Protecta FR Board 1-S to both sides of the wall. Protecta FR Pipes Wraps are required to be fitted around the pipe insulation. Minimum separation and maximum aperture according to section B.1.2.

Construction details:

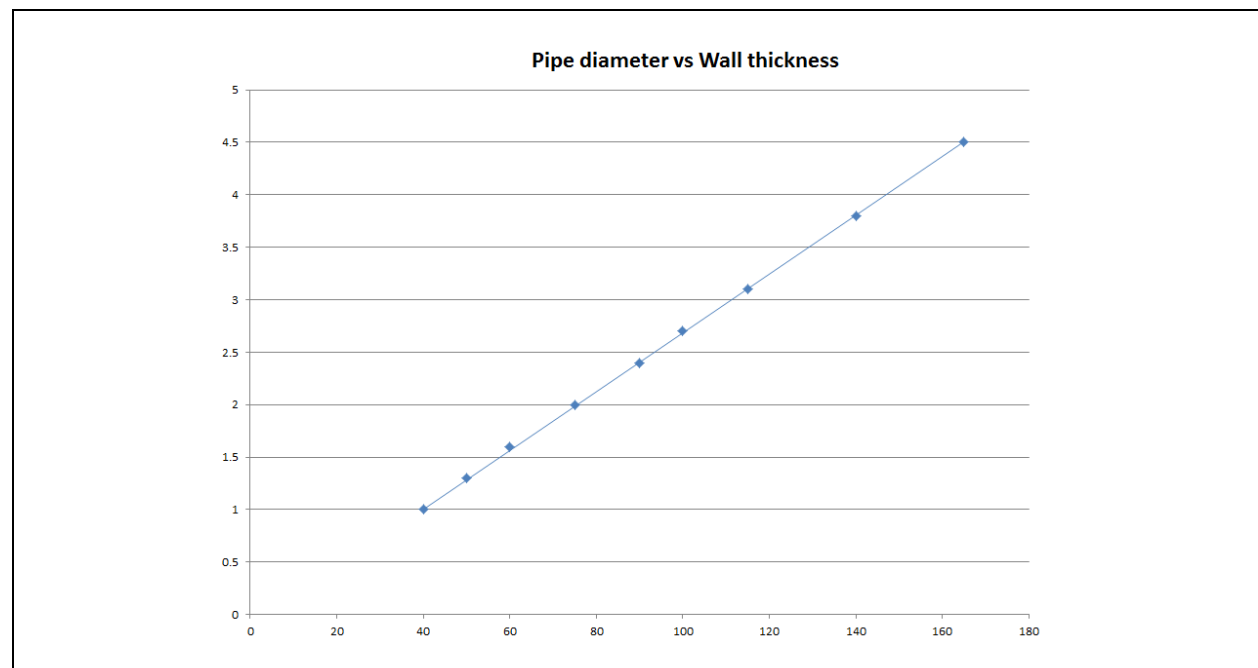


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Two layer penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
Up to 40 mm diameter/1-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted centrally	13 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 120 U/C, EI 120 U/U, EI 120 C/U, EI 120 C/C
Up to 40 mm diameter/1-14.2 mm wall*	2 off 50 x 3.6 mm Protecta FR Pipe Wrap, one fitted flush to each face of seal	13 – 32 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	E 120 U/C, E 120 U/U, E 120 C/U, E 120 C/C, EI 60 U/C, EI 60 U/U, EI 60 C/U, EI 60 C/C
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

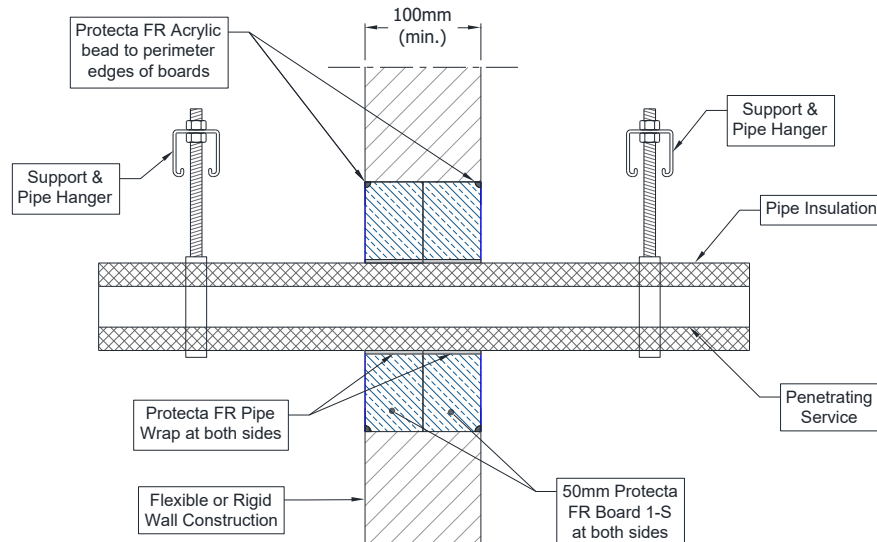


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Protecta FR Pipe Wrap pipe penetration seal with 2x Protecta FR Board 1-S

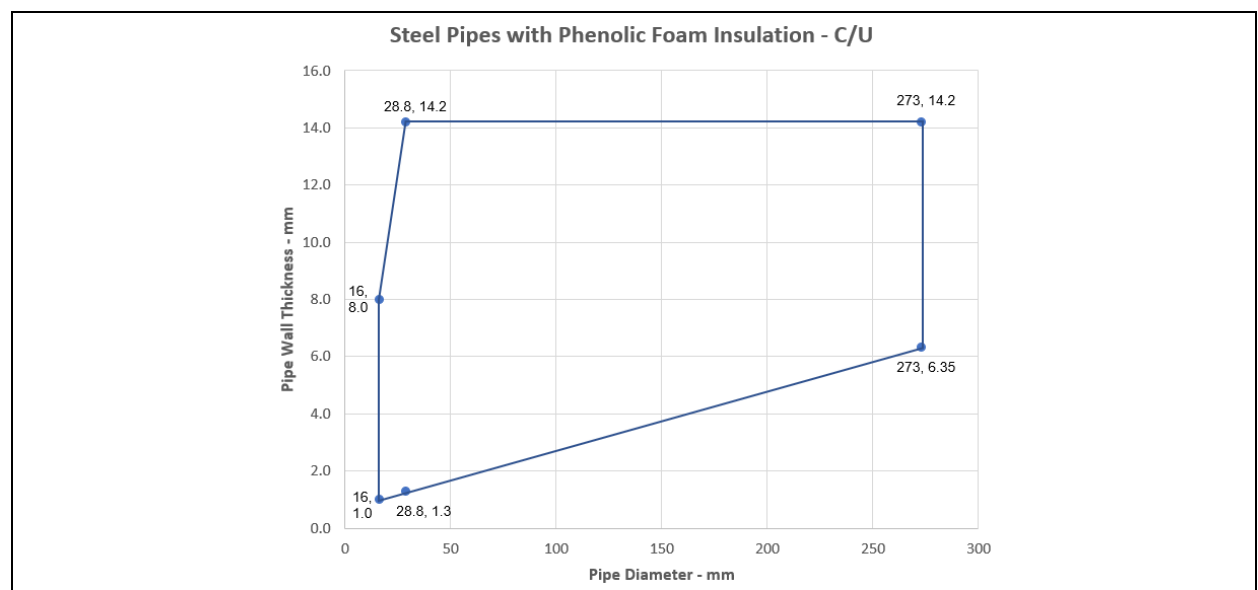
Penetration Seal: LS (Local Sustained) or CS (Continuous Sustained) insulated metallic and composite pipes fitted at any position within the aperture, with 50 mm Protecta FR Board 1-S to both sides of the wall. Protecta FR Pipes Wraps are required to be fitted around the pipe to both sides of the seal. Minimum separation and maximum aperture according to section B.1.2.

Construction details:



Two layer penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
16 mm diameter/1.0 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to both sides of the seal	15 mm phenolic foam insulation (CS)	EI 90 C/U
16-273 mm diameter/1.0-14.2 mm wall*		25-100 mm phenolic foam insulation (CS)	



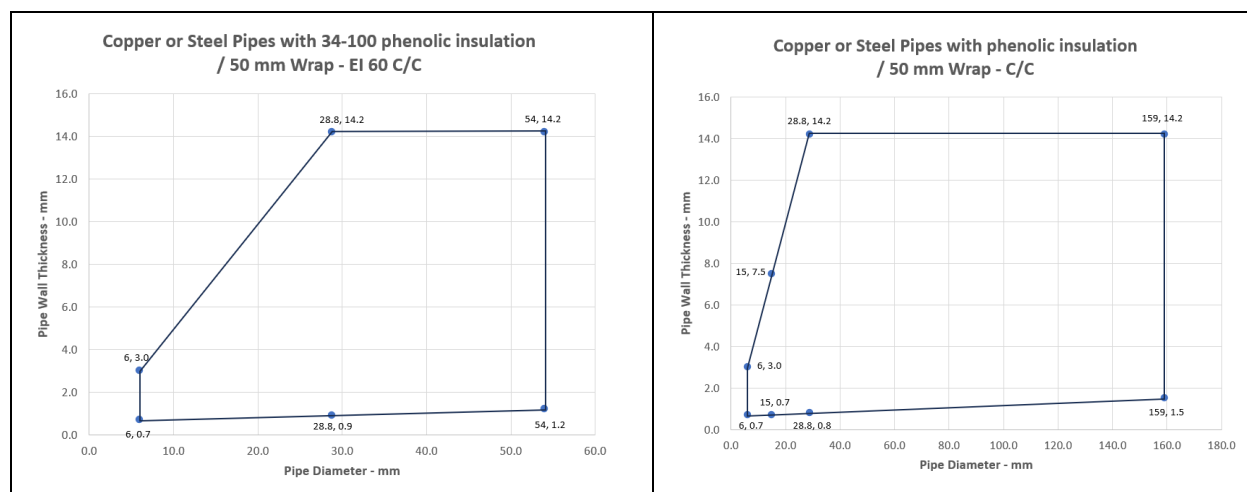
Solutions

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Services	Wrap	Insulation	Classification
Copper and steel pipe			
12 mm diameter/1 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation (LS and CS)	EI 120 C/C
12-54 mm diameter/1-1.2 mm wall		9-13 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation (LS and CS)	E 120 C/C, EI 90 C/C
6-54 mm diameter/0.7-1.2 mm wall		13-25 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation (LS and CS)	E 120 C/C, EI 60 C/C
15 mm diameter/0.7 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to both sides of the seal	15 mm phenolic insulation (CS)	E 120 C/C, EI 90 C/C
6-54 mm diameter/0.7-14.2 mm wall*		34-100 mm phenolic insulation (CS)	EI 60 C/C
55-159 mm diameter/0.7-14.2 mm wall*		100 mm phenolic insulation (CS)	EI 60 C/C
6-159 mm diameter/0.7-14.2 mm wall*		15 mm phenolic insulation (CS)	E 120 C/C, EI 30 C/C
6-159 mm diameter/0.7-14.2 mm wall*		16-99 mm phenolic insulation (CS)	E 60 C/C, EI 30 C/C
6-54 mm diameter/0.7-14.2 mm wall*	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	40 mm PU foam insulation (CS)	E 120 C/C, EI 60 C/C

*See below graph for interpolation pipe sizes



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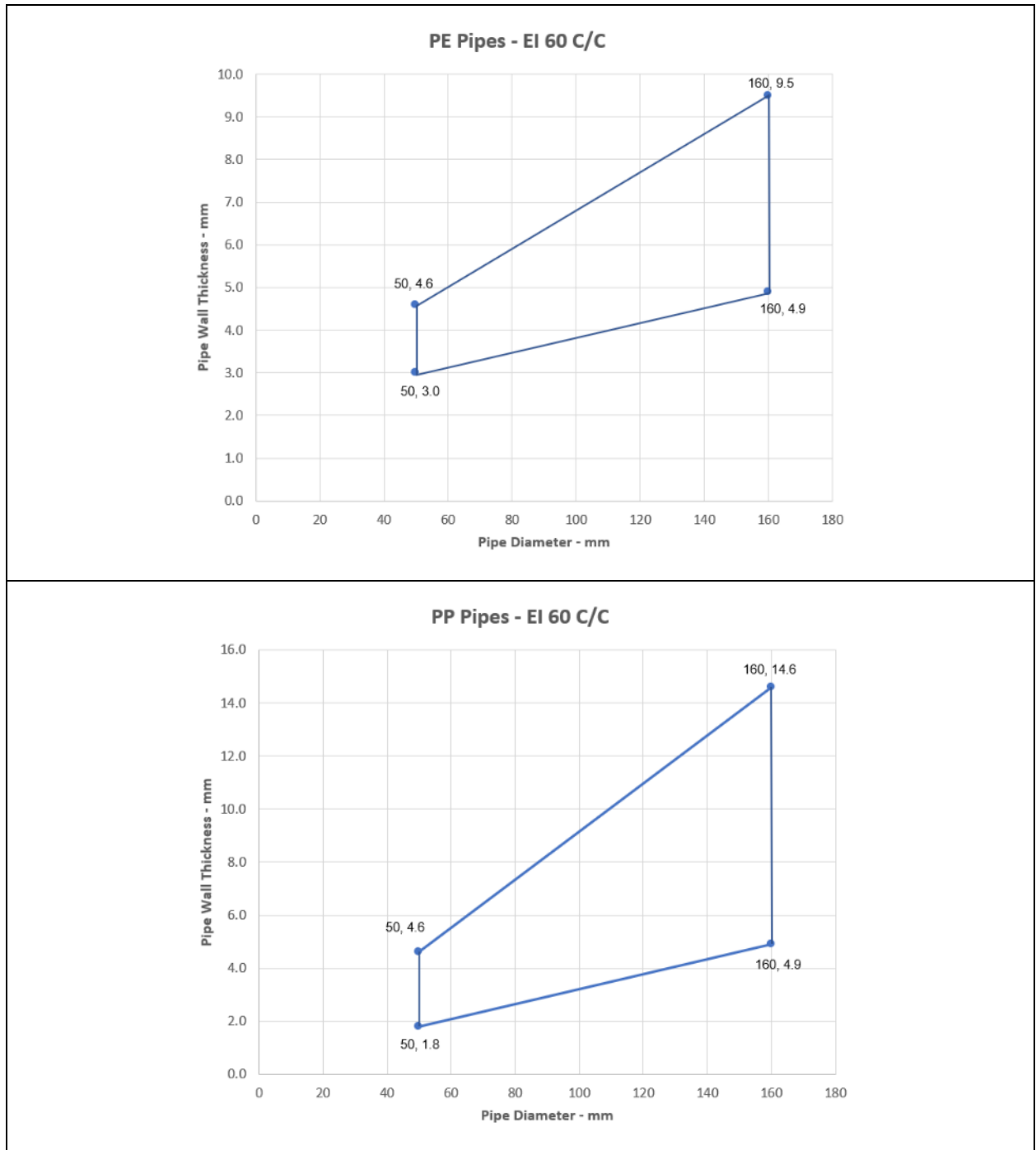
Services	Wrap	Insulation	Classification
Alupex pipe	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9-25 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 120 C/C
16 mm diameter/2.25 mm wall			
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm 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			
25 mm diameter/2.5 mm wall		13 mm polyethylene foam with plastic sheaving	E 90 C/C, EI 60 C/C

Services	Outer diameter including insulation	Pipe wrap	Pipe insulation	Classification
PE pipe according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9-50 mm Elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 60 C/C
	Maximum 178 mm diameter	50 x 10.8 mm Protecta FR Pipe Wrap fitted to both sides of the seal		
	Maximum 260 mm diameter	50 x 18.0 mm Protecta FR Pipe Wrap fitted to both sides of the seal		
PP pipe according to EN 1852-1: 2009				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the seal	9-50 mm Elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 60 C/C
	Maximum 178 mm diameter	50 x 10.8 mm Protecta FR Pipe Wrap fitted to both sides of the seal		
	Maximum 260 mm diameter	50 x 18.0 mm Protecta FR Pipe Wrap fitted to both sides of the seal		

*See below graph for interpolation pipe sizes



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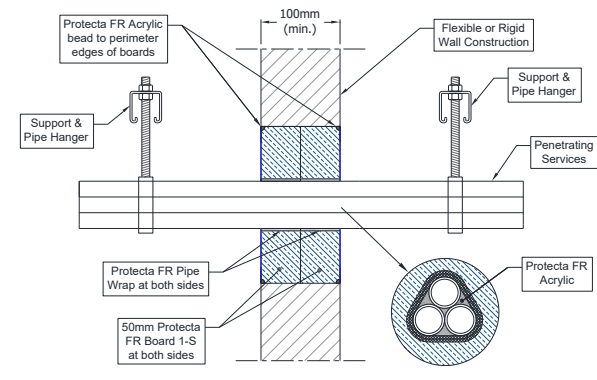
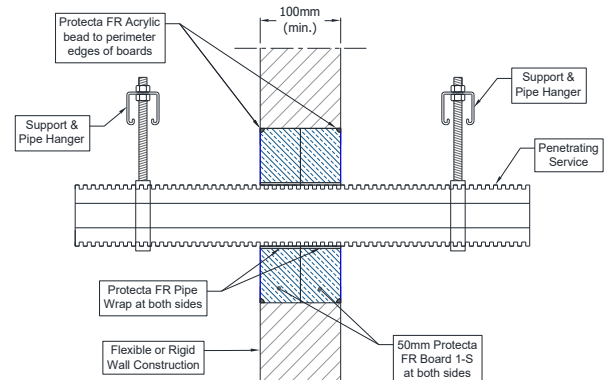
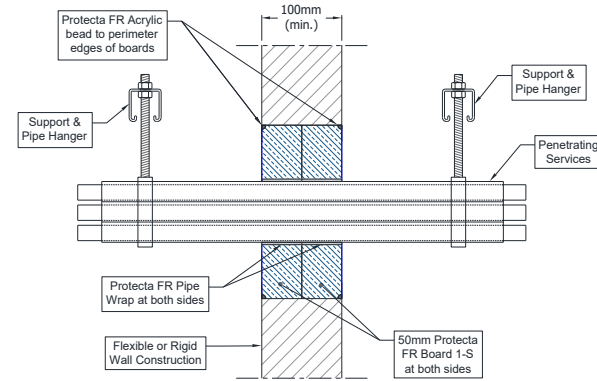
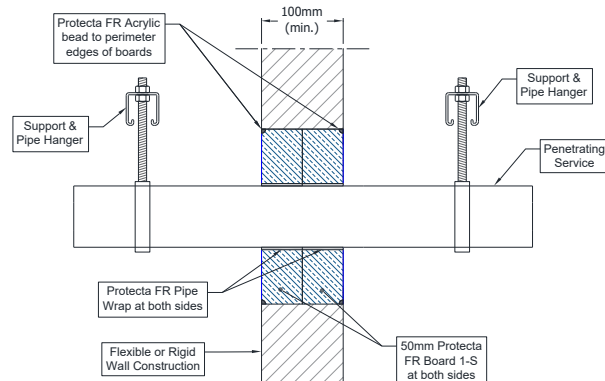


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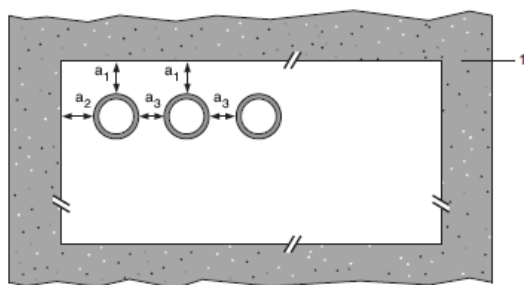
Protecta FR Pipe Wrap penetration seal for plastic pipes, in 2x Protecta FR Board 1-S, in flexible or rigid walls

Penetration Seal: Combustible pipes sealed with Protecta FR Pipe Wrap, to both sides of the wall. Minimum separation and maximum aperture according to section B.1.2 (Configuration 1 & 2).

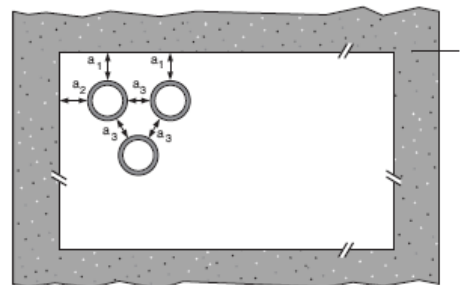
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation



Solutions

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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
PVC-U pipe according to EN 1329-1, EN 1452-2 and EN 1453-1 and PVC-C according to EN 1566-1			
Diameter up to 40 mm, wall thickness 1.9 – 3.0 mm	50 x 1.8 mm (1 layer)	1 & 2	EI 120 U/U, EI 120 C/U, EI 120 U/C, EI 120 C/C
Diameter up to 50 mm, wall thickness 1.0 – 1.8 mm	50 x 3.6 mm (2 x 1.8 layer)		EI 120 U/C, EI 120 C/C
Diameter up to 110 mm, wall thickness 2.7 - 6.6 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 125 mm, wall thickness 3.7 – 7.4 mm	50 x 5.4 mm (3 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 9.5 mm *	50 x 7.2 mm (4 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 4.0-9.5 mm *	50 x 10.8 mm (6 x 1.8 layer)		E 90 U/C, E 90 C/C EI 60 U/C, EI 60 C/C
Diameter up to 200 mm, wall thickness 4.9-11.9 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 90 C/C
Diameter up to 315 mm, wall thickness 7.7-12.1 mm*	50 x 18 mm (10 x 1.8 layers)		EI 90 C/C
Diameter up to 400 mm, wall thickness 9.8-15.3 mm*	50 x 28.8 mm (16 x 1.8 layers)		EI 90 C/C
Diameter up to 110 mm, wall thickness 2.7–6.6 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
Diameter up to 32 mm Ø, wall thickness 1.0-2.4 mm with or without cables up to 14 mm Ø, in pipe bundles up to 110 mm Ø ¹⁾	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C



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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
PE pipe according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1			
Diameter up to 40 mm, wall thickness 2.4 – 3.7 mm	50 x 1.8 mm (1 layer)	1 & 2	EI 120 U/U, EI 120 C/U, EI 120 U/C, EI 120 C/C
Diameter up to 110 mm, wall thickness 4.2 - 10 mm	50 x 3.6 mm (2 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 125 mm, wall thickness 4.8 – 12 mm	50 x 5.4 mm (3 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 14.6 mm	50 x 7.2 mm (4 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 4.9-14.6 mm	50 x 10.8 mm (6 x 1.8 layer)		E 90 U/C, E 90 C/C EI 60 U/C, EI 60 C/C
Diameter up to 200 mm, wall thickness 6.2-18.2 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 90 C/C
Diameter up to 315 mm, wall thickness 18.7 mm	50 x 18 mm (10 x 1.8 layers)		EI 60 C/C
Diameter up to 315 mm, wall thickness 12.1-18.6 mm	50 x 18 mm (10 x 1.8 layers)		EI 30 C/C
Diameter up to 400 mm, wall thickness 23.7 mm	50 x 28.8 mm (16 x 1.8 layers)		EI 60 C/C
Diameter up to 110 mm, wall thickness 4.2–10 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
Diameter up to 40 mm Ø, wall thickness 2.0-3.7 mm with or without cables up to 14 mm Ø, in pipe bundles up to 110 mm Ø ¹⁾	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C



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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
PP pipe according to EN 1852-1: 2009			
Diameter up to 40 mm, wall thickness 1.8 – 5.5 mm	50 x 1.8 mm (1 layer)	1 & 2	EI 120 U/U, EI 120 C/U, EI 120 U/C, EI 120 C/C
Diameter up to 110 mm, wall thickness 2.7 - 15.1 mm	50 x 3.6 mm (2 x 1.8 layer)		EI 90 U/U, EI 90 C/U, EI 90 U/C, EI 90 C/C
Diameter up to 125 mm, wall thickness 3.1 – 17.1 mm	50 x 5.4 mm (3 x 1.8 layer)		E 120 U/C, E 120 C/C EI 90 U/C, EI 90 C/C
Diameter up to 160 mm, wall thickness 21.9 mm	50 x 7.2 mm (4 x 1.8 layer)		EI 60 U/C, EI 60 C/C
Diameter up to 160 mm, wall thickness 4.9-21.9 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 90 C/C
Diameter up to 200 mm, wall thickness 4.9-18.2 mm	50 x 10.8 mm (6 x 1.8 layer)		EI 60 C/C
Diameter up to 315 mm, wall thickness 28.6 mm	50 x 18 mm (10 x 1.8 layers)		EI 30 C/C
Diameter up to 315 mm, wall thickness 12.1-28.5 mm	50 x 18 mm (10 x 1.8 layers)		EI 45 C/C
Diameter up to 400 mm, wall thickness 22.7 mm	50 x 28.8 mm (16 x 1.8 layers)		E 120 U/C, EI 90 U/C
Diameter up to 110 mm, wall thickness 2.7–15.1 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C
Diameter up to 40 mm Ø, wall thickness 1.8-2.0 mm with or without cables up to 14 mm Ø, in pipe bundles up to 110 mm Ø ¹⁾	50 x 3.6 mm (2 x 1.8 layers)		

¹⁾ PVC, PE and PP pipes can be mixed in the same bundle.

Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Uponor Wirsbo PEX double pipe in pipe system according to ISO 15875			
Diameter up to 54 mm/4.0 mm wall thickness (outer pipe), 28 mm diameter/0.4 mm wall thickness (inner pipe)	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 C/C
Diameter up to 25 mm pipes, wall thickness 0.6 mm, in bundles up to 50 mm	50 x 3.6 mm (2 x 1.8 layers)		EI 90 C/C



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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Uponor Decibel pipe according to EN 1451-1			
50 mm diameter/2.0 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 90 U/U
75-110 mm diameter/2.6-3.8 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C
BluePower Multilayer pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 90 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 90 C/U
125-160 mm diameter/3.9-4.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C
Rehau Raupiano Plus PP-DD according to DIN 4102			
40-50 mm diameter/1.8-2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)		EI 120 U/C
160 mm diameter/3.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Polo-Kal NG Poloplast PP-MV according to DIN 4102			
32-50 mm diameter/2.0-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)		EI 120 U/C
160 mm diameter/4.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Aquatherm Green SDR9 MF PP-RP according to ISO 21003			
32 mm diameter/3.0 mm wall thickness	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	E 120 C/C, EI 90 C/C
40-50 mm diameter/5.6-12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 C/C, EI 90 C/C
63-110 mm diameter/12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 C/C, EI 90 C/C
Wavin SiTech + PP-M B according to EN 13501-1			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 90 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 60 U/C



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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Wavin AS+ pipes according to EN 12056 and DIN 1986-100			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/C, EI 90 U/C
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
160-200 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 C/C
Geberit Silent PP according to DIN 4102			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C
Huliot Ultra Silent pipes according to EN 1451-1			
50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 90 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C
160-200 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		E 120 C/C, EI 90 C/C
Valsir PP3 pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 20 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Valsir Blackfire pipes according to DIN 4102			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Valsir Triplus pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
125 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		E 120 U/C, EI 90 U/C
160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C

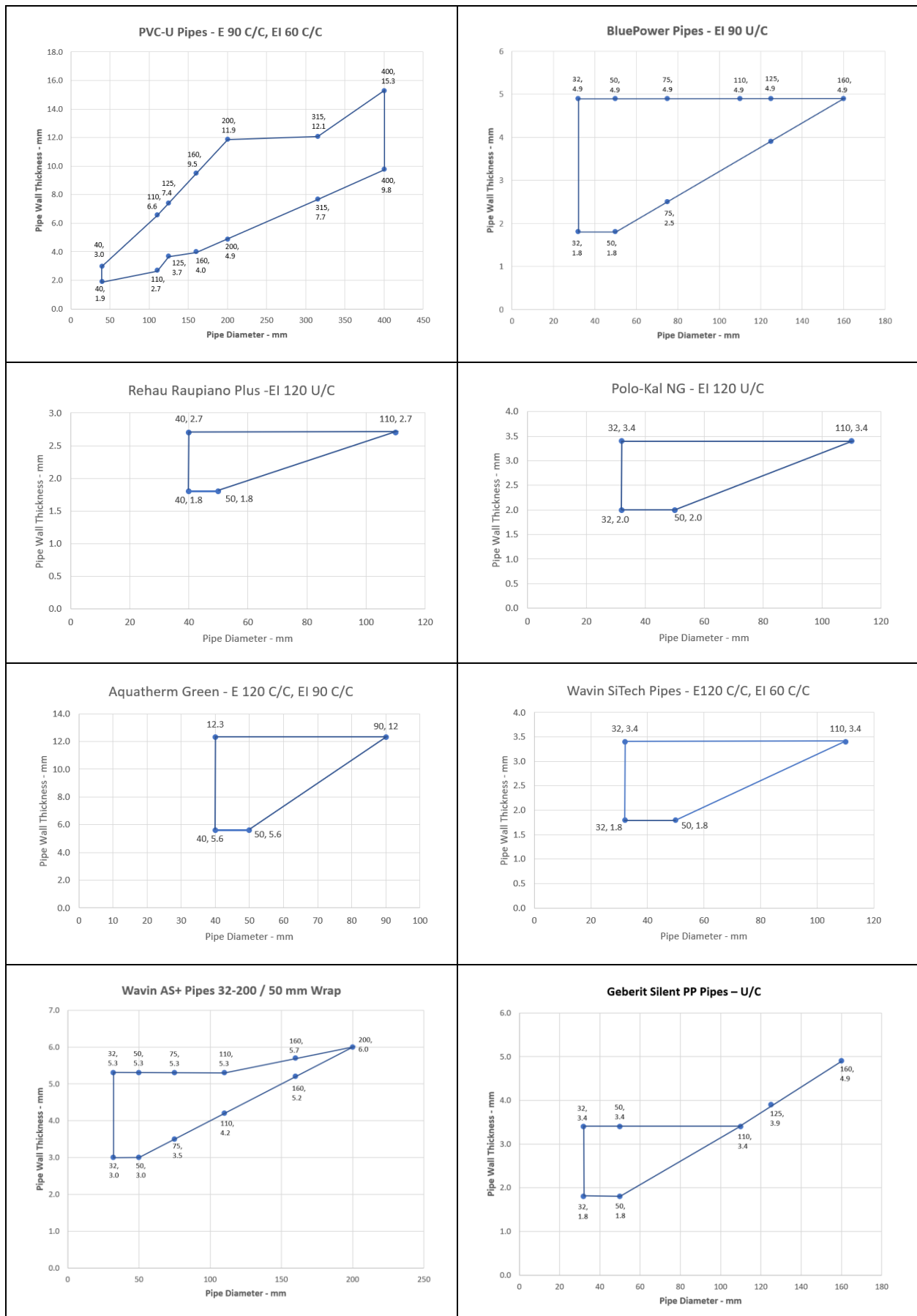
*See below graph for interpolation pipe sizes



Solutions

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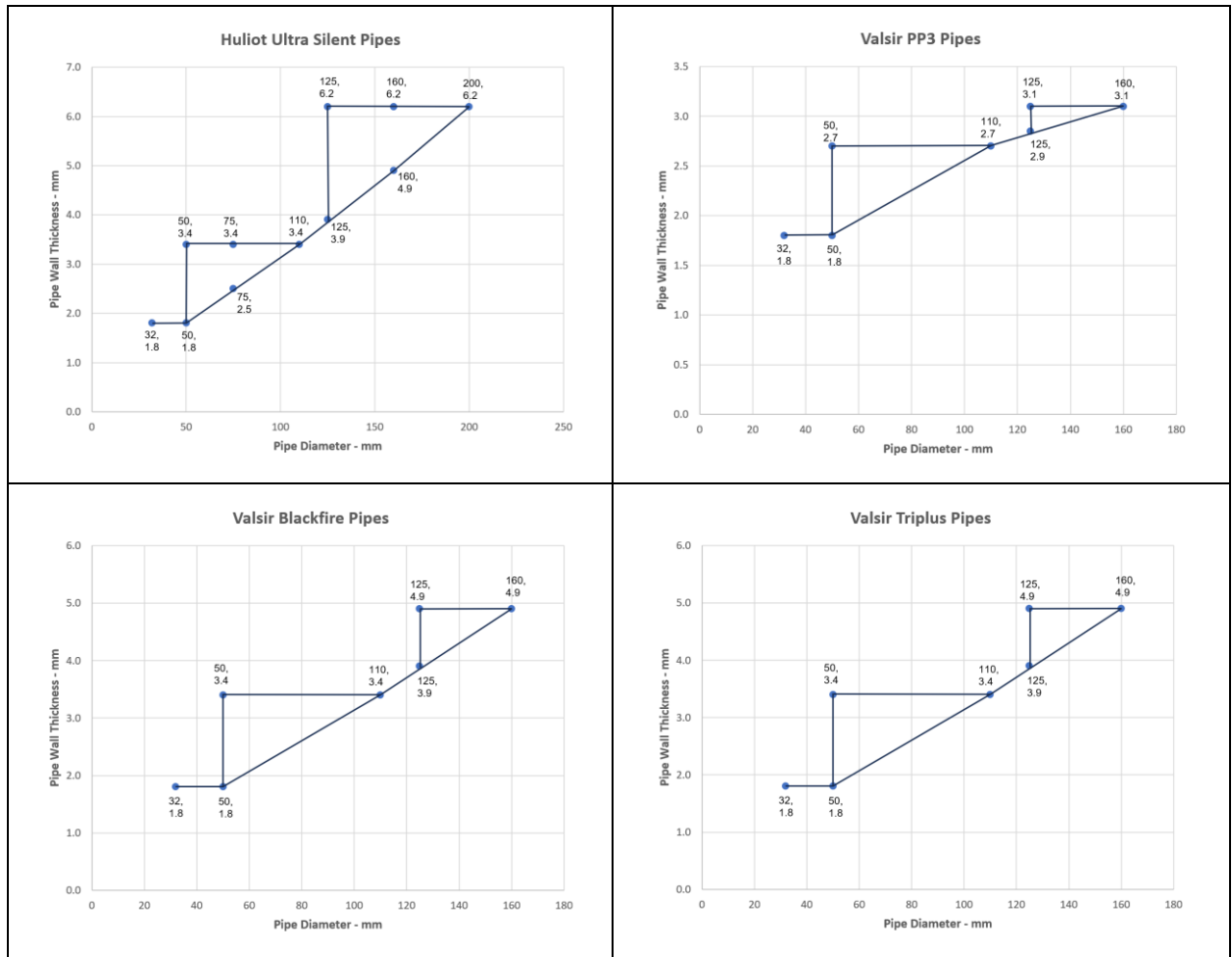
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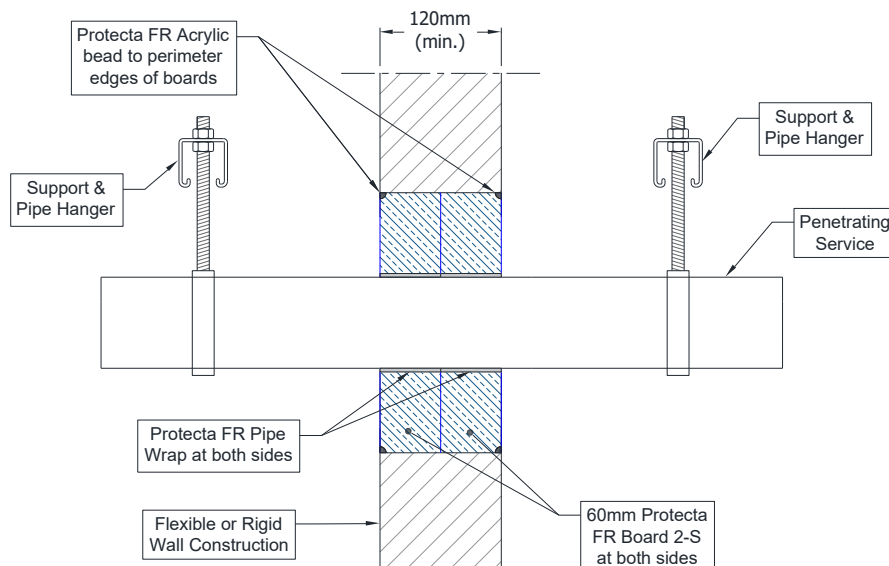


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Protecta FR Pipe Wrap pipe plastic pipe penetration seal with 2x Protecta FR Board 2-S

Penetration Seal: Pipes fitted at any position within the aperture, with 60 mm Protecta FR Board 2-S to both sides of the wall. Minimum separation and maximum aperture according to section B.1.2 (Configuration 1 & 2).

Construction details:



Double side penetration seal with plastic pipes

Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
PVC-U pipe according to EN 1329-1, EN 1452-2 and EN 1453-1 and PVC-C according to EN 1566-1			
Diameter up to 40 mm, wall thickness 1.9-3.0 mm	50 x 3.6 mm (2 x 1.8 layer)	1 & 2	EI 120 C/C
Diameter up to 110 mm, wall thickness 2.7-6.6 mm	50 x 3.6 mm (2 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 4.0-9.5 mm	50 x 10.8 mm (6 x 1.8 layer)		
PE pipe according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1			
Diameter up to 40 mm, wall thickness 2.4-4.6 mm	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	EI 120 C/C
Diameter up to 110 mm, wall thickness 3.4-10.0 mm	50 x 3.6 mm (2 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 4.9-14.6 mm	50 x 10.8 mm (6 x 1.8 layer)		
PP pipe according to EN 1852-1: 2009			
Diameter up to 40 mm, wall thickness 1.8-5.5 mm	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	EI 120 C/C
Diameter up to 110 mm, wall thickness 2.7-10.0 mm	50 x 3.6 mm (2 x 1.8 layer)		
Diameter up to 160 mm, wall thickness 4.9-14.6 mm	50 x 10.8 mm (6 x 1.8 layer)		

*See below graph for interpolation pipe sizes

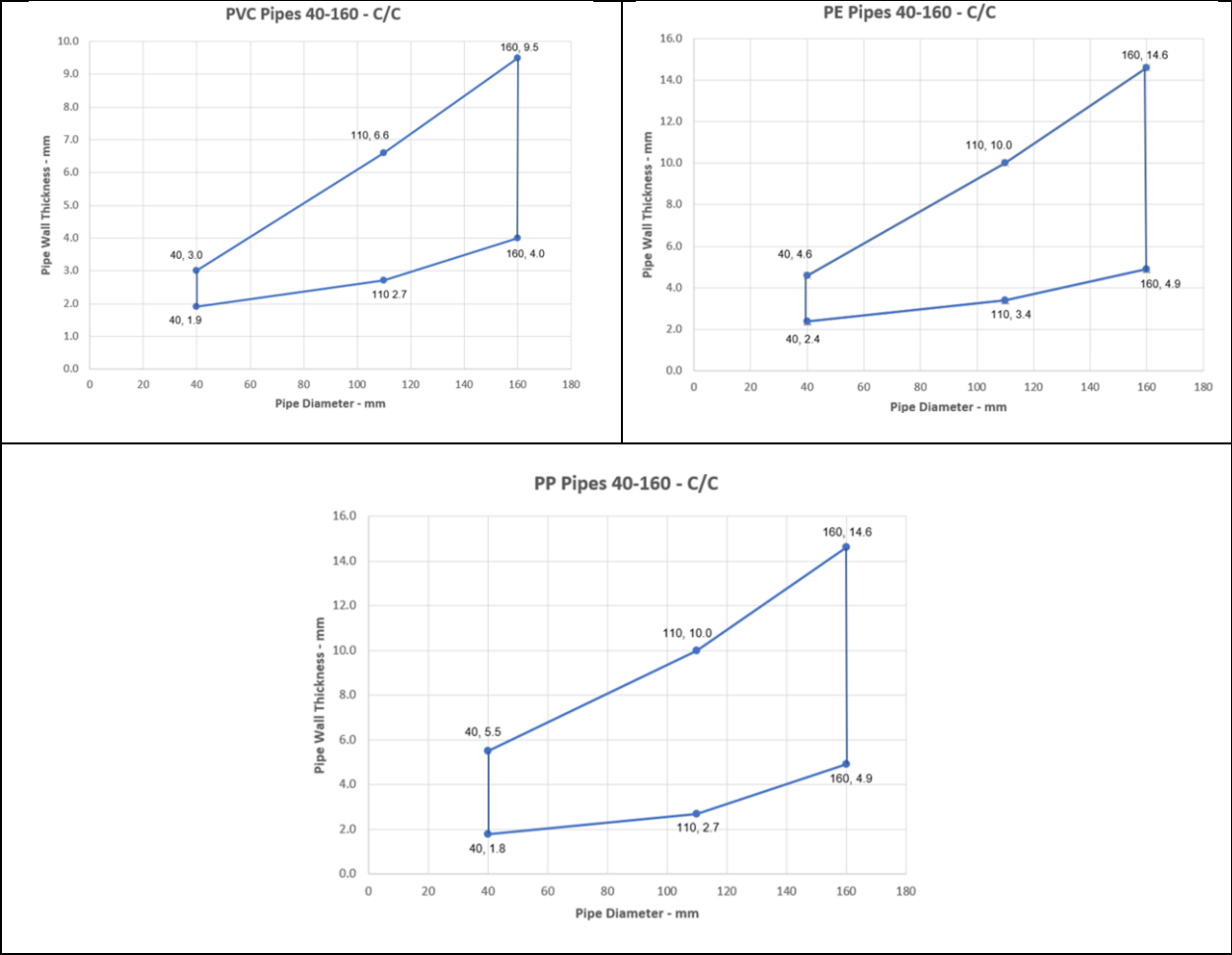
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Solutions

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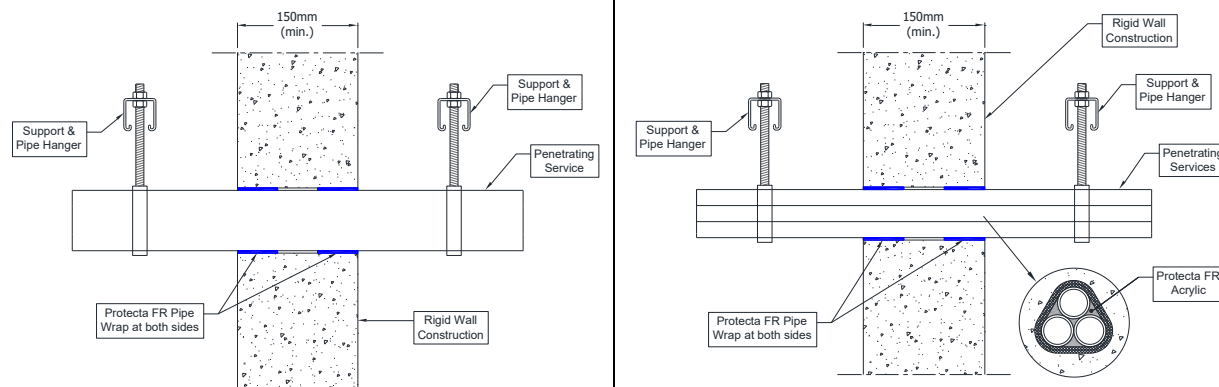
Protecta FR Pipe Wrap in Rigid Wall and Floor Constructions

Rigid wall constructions according to C.1.1)

Penetration seal with Protecta FR Pipe Wrap

Penetration Seal: Plastic pipes with Protecta FR Pipe Wraps fitted around the pipe, cast or friction fitted within the wall. Minimum separation and maximum aperture according to C.1.3.

Construction details:



Double side penetration seal with pipes

Services	Wrap	Classification
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1 and PVC-C according to EN 1566-1		
Up to 40 mm diameter / 1.9-3.0 mm wall*	50 x 1.8 mm	EI 120 U/U
Up to 40 mm diameter / 1.9-3.0 mm wall*	50 x 1.8 mm	EI 240 U/C
Up to 40 mm diameter / 3.1-4.3 mm wall	50 x 1.8 mm	E 120 U/C, EI 60 U/C
Up to 50 mm diameter / 1.0-1.8 mm wall*	50 x 3.6 mm	EI 120 U/C
Up to 110 mm diameter / 2.7-6.6 mm wall*	50 x 3.6 mm	EI 240 U/C
Up to 125 mm diameter / 3.7-7.4 mm wall*	50 x 5.4 mm	EI 120 U/C
Up to 125 mm diameter / 4.7-7.4 mm wall*	50 x 7.2 mm	EI 240 U/C
Up to 160 mm diameter / 3.2-9.5 mm wall*	50 x 7.2 mm	EI 60 U/C
Up to 160 mm diameter / 4.0-9.5 mm wall*	50 x 10.8 mm	EI 240 U/C
Up to 200 mm diameter / 4.9-11.9 mm wall*	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter/7.7-12.1 mm wall thickness*#	75 x 18 mm	EI 120 C/C
Up to 400 mm diameter/9.8-15.3 mm wall thickness*#	75 x 28.8 mm	
Diameter up to 32 mm Ø, wall thickness 1.0-2.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 U/C
Diameter up to 110 mm, wall thickness 1.0-6.6 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C
Diameter up to 32 mm, wall thickness 1.0-2.4 mm, fully or partially filled conduits with cables up to 14 mm diameter, in pipe bundles up to 110 mm diameter ¹⁾	50 x 3.6 mm	EI 90 U/C

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Services	Wrap	Classification
PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1		
Up to 40 mm diameter / 2.4-3.7 mm wall	50 x 1.8 mm	EI 120 U/U
Up to 40 mm diameter / 2.4-4.6 mm wall*	50 x 1.8 mm	EI 240 U/C
Up to 110 mm diameter / 3.4-10.0 mm wall*	50 x 3.6 mm	EI 240 U/C
Up to 125 mm diameter / 4.8-12.0 mm wall*	50 x 5.4 mm	E 120 U/C, EI 90 U/C
Up to 125 mm diameter / 3.9-7.4 mm wall*	50 x 7.2 mm	EI 240 U/C
Up to 160 mm diameter / 4.9-9.5 mm wall*	50 x 10.8 mm	EI 240 U/C
Up to 160 mm diameter / 9.6-14.6 mm wall*	50 x 10.8 mm	E 90 U/C, EI 60 U/C
Up to 160 mm diameter / 9.6-14.6 mm wall*	50 x 10.8 mm	EI 120 C/C
Up to 200 mm diameter / 4.9-18.2 mm wall*	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter / 18.7-28.5 mm wall*	75 x 18.0 mm	E 180 C/C, EI 60 C/C
Up to 315 mm diameter / 28.6 mm wall	75 x 18.0 mm	E 180 C/C, EI 120 C/C
Up to 400 mm diameter / 9.8-36.2 mm wall*	75 x 28.8 mm	EI 30 C/C
Up to 400 mm diameter / 23.7 mm wall	50 x 28.8 mm	EI 60 C/C
Up to 400 mm diameter / 23.7-36.2 mm wall	75 x 28.8 mm	EI 60 C/C
Up to 400 mm diameter / 36.3 mm wall	75 x 28.8 mm	EI 120 C/C
Diameter up to 32 mm Ø, wall thickness 2.0-4.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 C/U
Diameter up to 110 mm, wall thickness 2.0–10.0 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C
Diameter up to 40 mm Ø, wall thickness 2.0-3.7 mm, fully or partially filled conduits with cables up to 14 mm diameter, in pipe bundles up to 110 mm diameter ¹⁾	50 x 3.6 mm	EI 90 U/C
PP pipe according to EN 1451-1		
Up to 40 mm diameter / 1.8-5.5 mm wall*	50 x 1.8 mm	EI 120 U/U
Up to 40 mm diameter / 1.8-5.5 mm wall*	50 x 1.8 mm	EI 240 U/C
Up to 110 mm diameter / 2.7-10.0 mm wall*	50 x 3.6 mm	EI 240 C/C
Up to 110 mm diameter / 2.7-15.1 mm wall*	50 x 3.6 mm	EI 90 U/U
Up to 125 mm diameter / 3.1-17.1 mm wall	50 x 5.4 mm	E 120 U/C, EI 90 U/C
Up to 125 mm diameter / 3.1-11.4 mm wall*	50 x 7.2 mm	EI 240 C/C
Up to 160 mm diameter / 4.9-14.6 mm wall*	50 x 10.8 mm	EI 240 C/C
Up to 160 mm diameter / 4.9-21.9 mm wall	50 x 10.8 mm	EI 60 U/C
Up to 200 mm diameter / 4.9-18.2 mm wall*	75 x 10.8 mm	EI 180 C/C
Up to 315 mm diameter / 12.1-28.5 mm wall*	50 x 18 mm	EI 30 C/C
Up to 315 mm diameter / 28.6 mm wall*	50 x 18 mm	EI 60 C/C
Up to 400 mm diameter / 22.7 mm wall*	50 x 28.8 mm	EI 45 C/C
Diameter up to 32 mm Ø, wall thickness 1.8-4.4 mm in pipe bundles up to 107 mm Ø ¹⁾	50 x 3.6 mm	EI 240 C/U
Diameter up to 110 mm, wall thickness 1.8–10.0 mm, fully or partially filled conduits with cables up to 14 mm diameter	50 x 3.6 mm	EI 120 U/C
Diameter up to 40 mm Ø, wall thickness 1.8-2.0 mm, fully or partially filled conduits with cables up to 14 mm diameter, in pipe bundles up to 110 mm diameter ¹⁾	50 x 3.6 mm	EI 90 U/C

¹⁾ PVC, PE and PP pipes can be mixed in the same bundle.

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

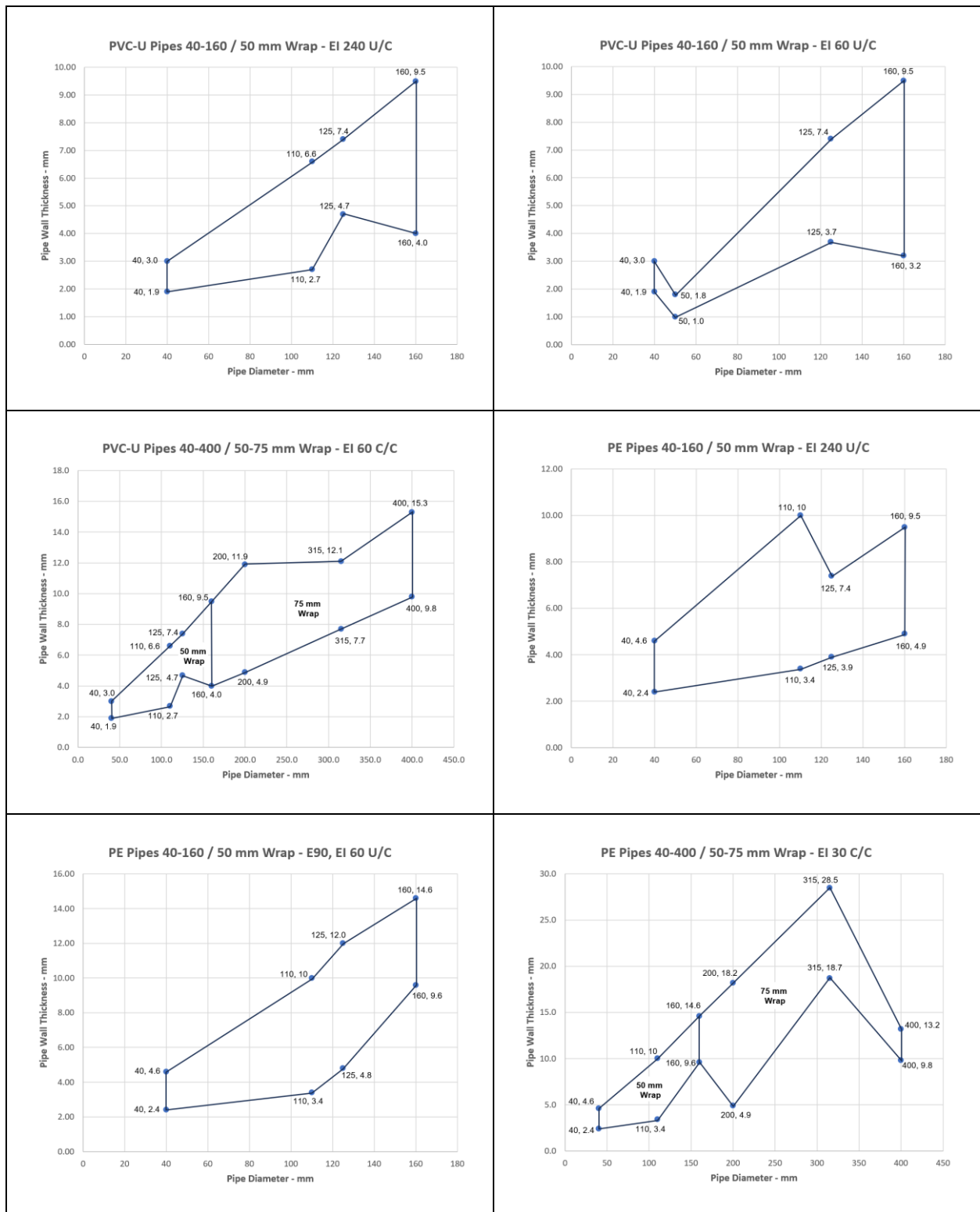
Configuration 1 & 2



Solutions

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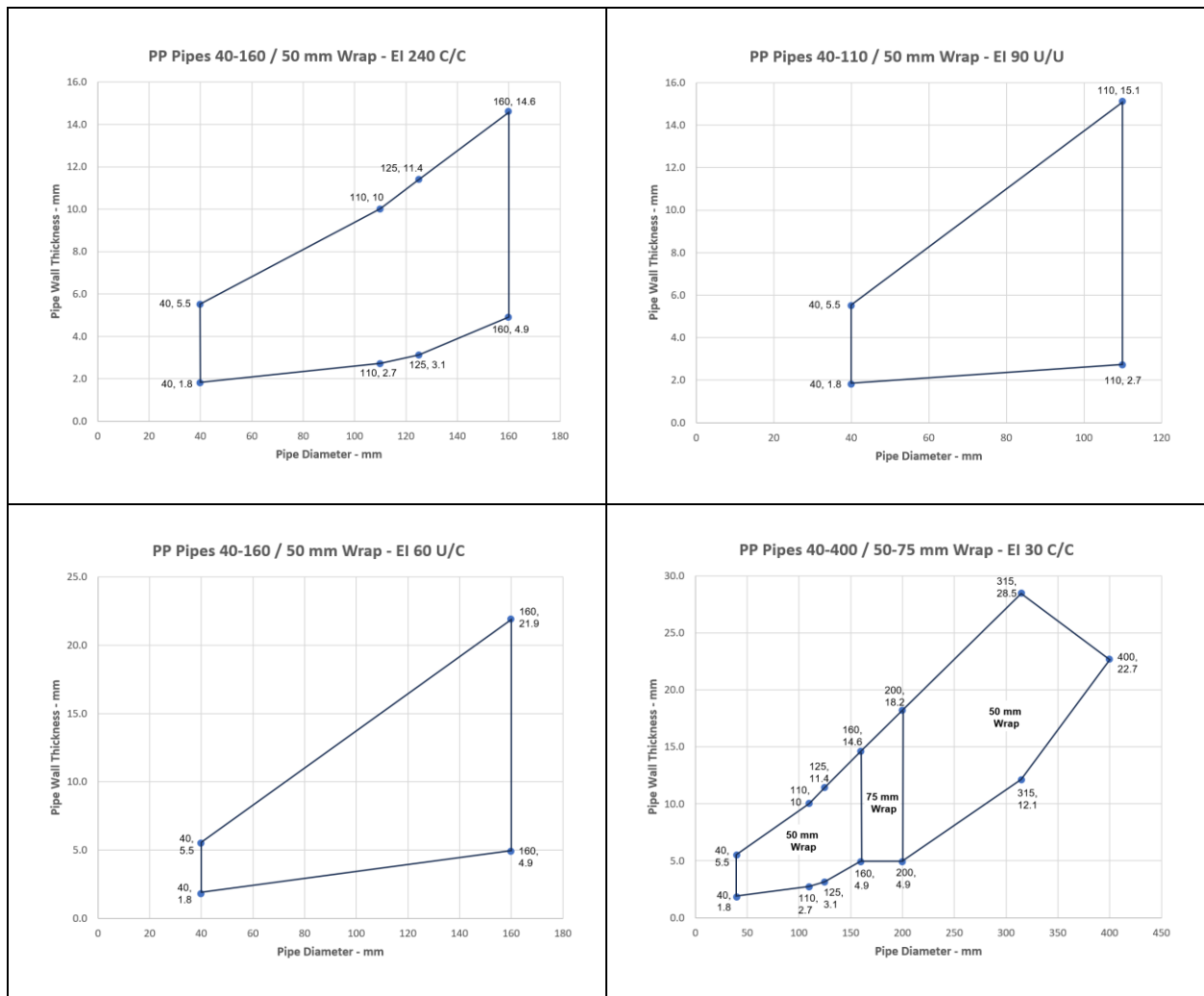
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Solutions

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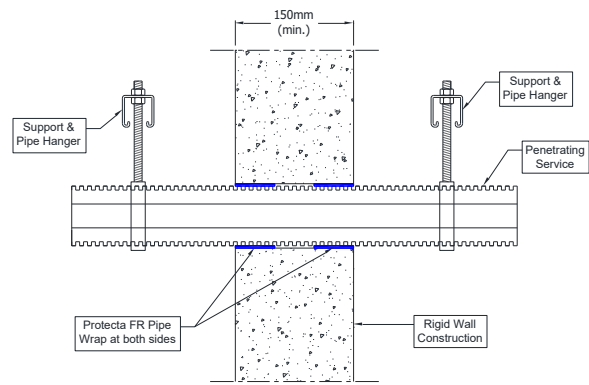
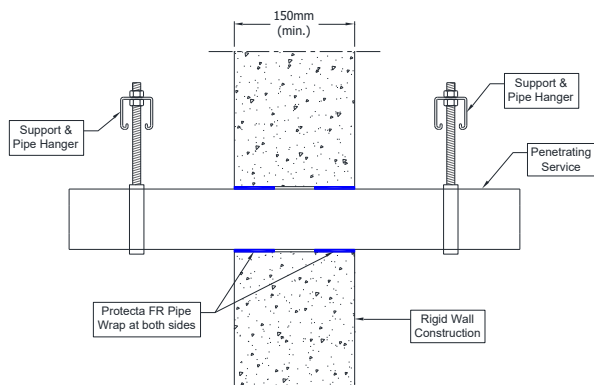
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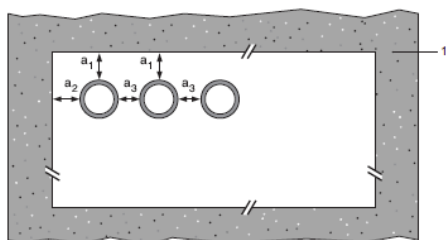
Protecta FR Pipe Wrap penetration seal for plastic pipes, in rigid walls

Penetration Seal: Combustible pipes sealed with Protecta FR Pipe Wrap, to both sides of the wall. Minimum separation and maximum aperture according to C.1.3) (Configuration 1 & 2).

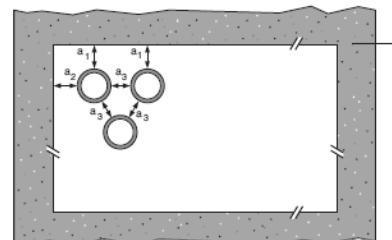
Construction details:



Configuration 1:



Configuration 2:



Key

- 1 Supporting construction
- a1 Pipe / top edge of seal separation
- a2 Pipe / side edge of seal separation
- a3 Pipe / pipe separation

Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Uponor Wirsbo PEX double pipe in pipe system according to ISO 15875			
Diameter up to 54 mm/4.0 mm wall thickness (outer pipe), 28 mm diameter/0.4 mm wall thickness (inner pipe)	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 C/C
Diameter up to 25 mm pipes, wall thickness 0.6 mm, in bundles up to 50 mm	50 x 3.6 mm (2 x 1.8 layers)		EI 90 C/C
Uponor Decibel pipe according to EN 1451-1			
50 mm diameter/2.0 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 90 U/U
75-110 mm diameter/2.6-3.8 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C
BluePower Multilayer pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 90 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 90 C/U
125-160 mm diameter/3.9-4.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C



Solutions

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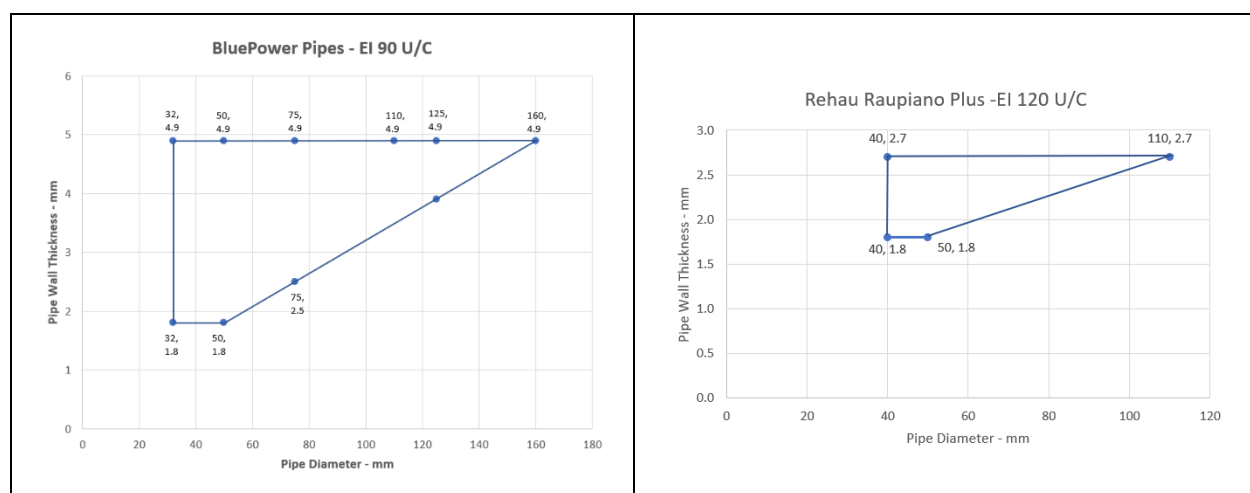
Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Rehau Raupiano Plus PP-DD according to DIN 4102			
40-50 mm diameter/1.8-2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)		EI 120 U/C
160 mm diameter/3.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Polo-Kal NG Poloplast PP-MV according to DIN 4102			
32-50 mm diameter/2.0-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)		EI 120 U/C
160 mm diameter/4.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Aquatherm Green SDR9 MF PP-RP according to ISO 21003			
32 mm diameter/3.0 mm wall thickness	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	E 120 C/C, EI 90 C/C
40-50 mm diameter/5.6-12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 C/C, EI 90 C/C
63-110 mm diameter/12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 C/C, EI 90 C/C
Wavin SiTech + PP-M B according to EN 13501-1			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 90 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 60 U/C
Wavin AS+ pipes according to EN 12056 and DIN 1986-100			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/C, EI 90 U/C
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
160-200 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 C/C
Geberit Silent PP according to DIN 4102			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C



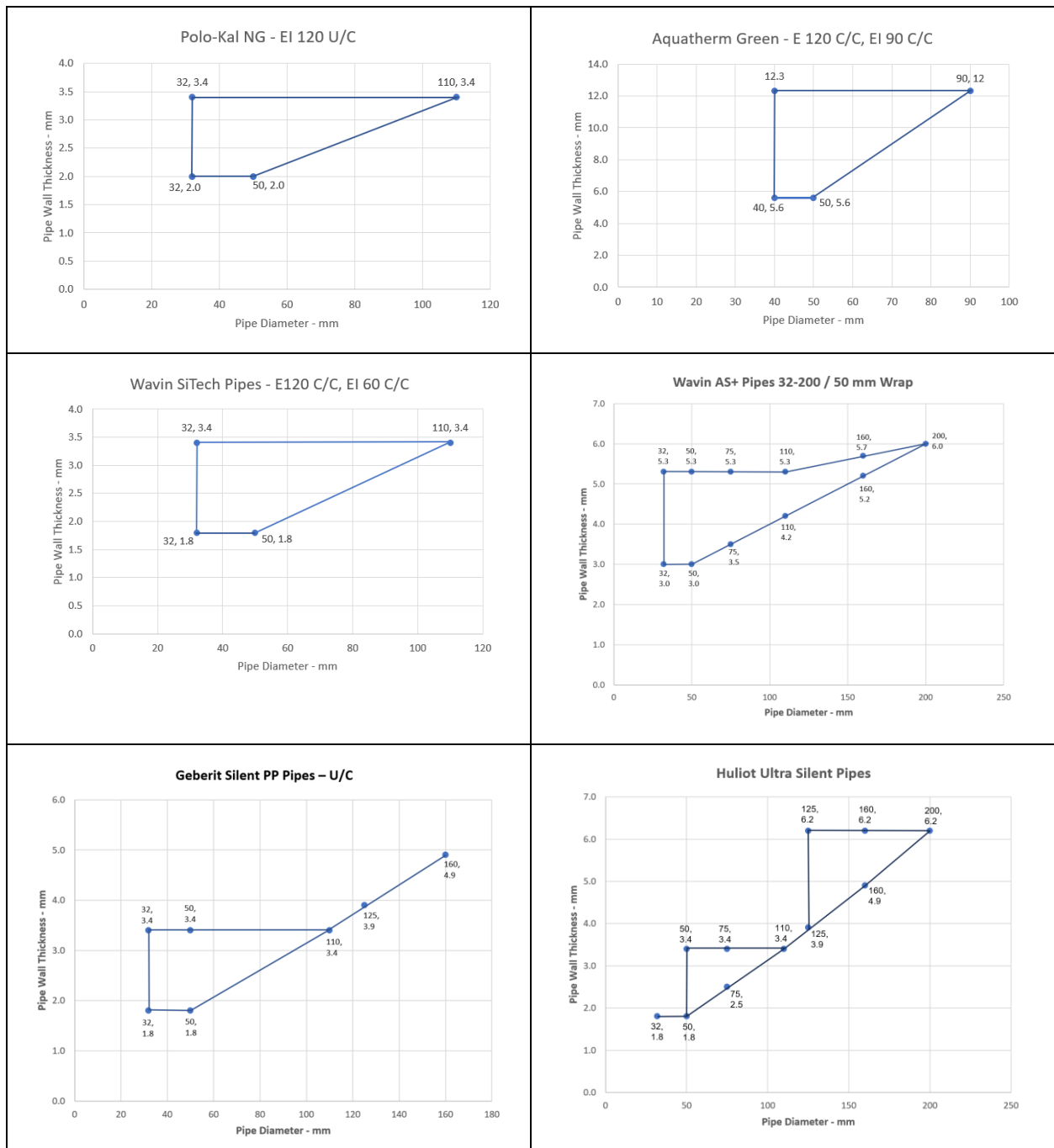
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Services	Wraps (both sides)	Permitted configuration for seal separation	Classification
Huliot Ultra Silent pipes according to EN 1451-1			
50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 90 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 90 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 90 U/C
160-200 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		E 120 C/C, EI 90 C/C
Valsir PP3 pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 20 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Valsir Blackfire pipes according to DIN 4102			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		EI 120 U/C
125-160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C
Valsir Triplus pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U
110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)		E 120 U/C, EI 90 U/C
125 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		E 120 U/C, EI 90 U/C
160 mm diameter*	50 x 10.8 mm (6 x 1.8 layers)		EI 120 U/C

*See below graph for interpolation pipe sizes



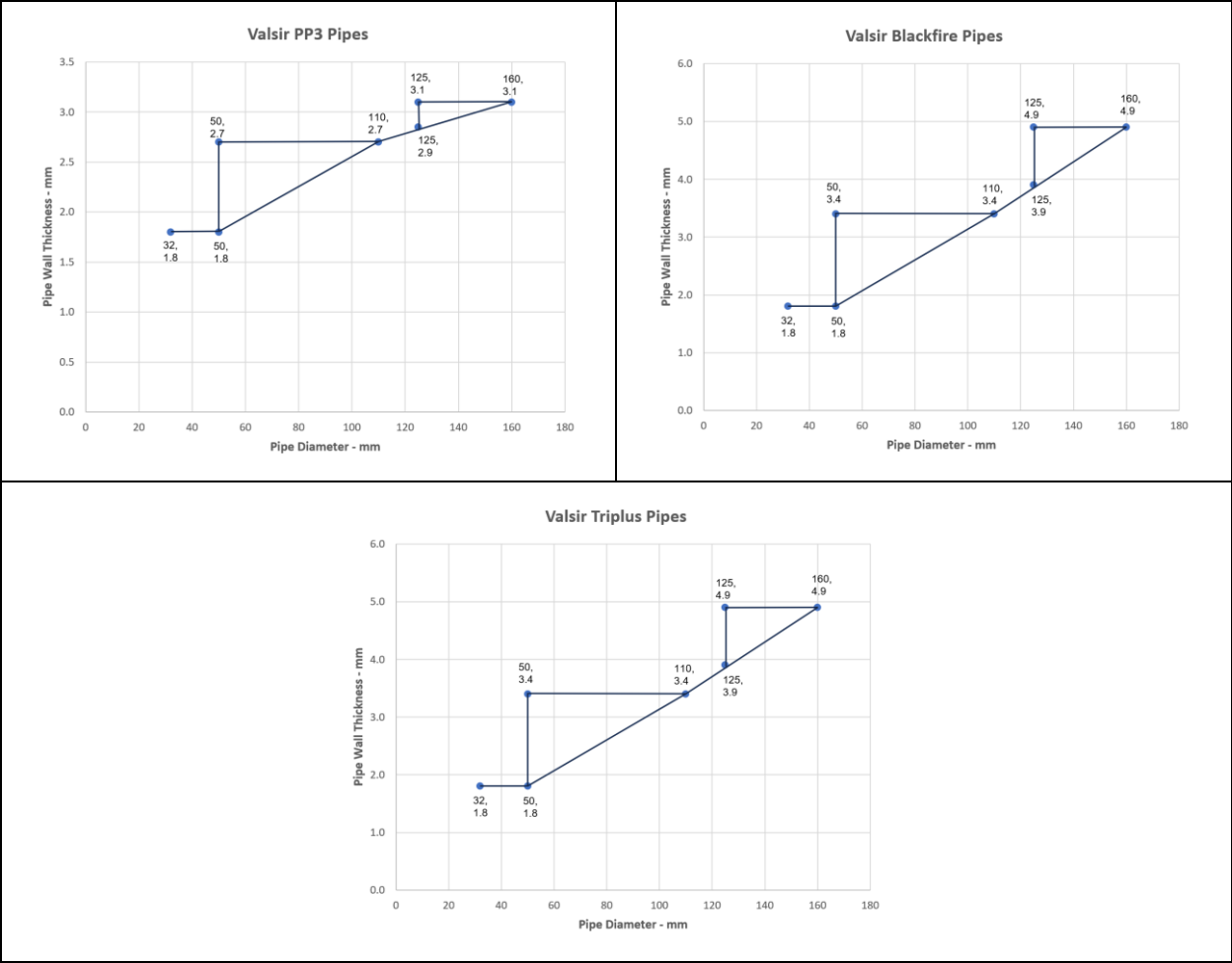
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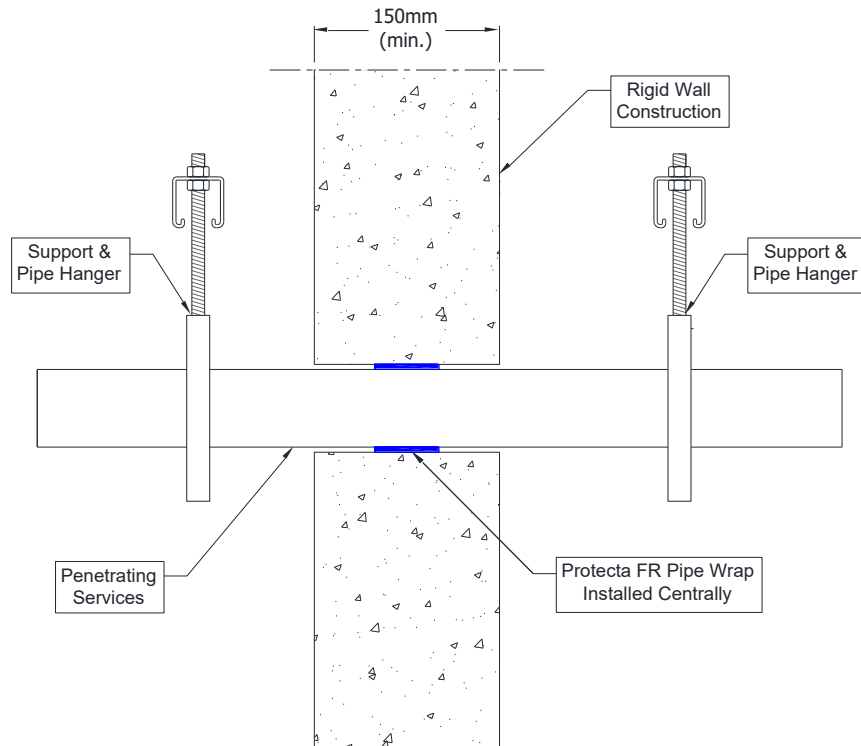


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Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: Plastic pipes with Protecta FR Pipe Wraps fitted around the pipe, cast or friction fitted within the wall. Minimum separation and maximum aperture according to C.1.3).

Construction details:



Penetration seal with pipes

Services	Wrap	Insulation	Classification
PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1			
315 mm diameter/ 9.2 mm wall	1 off 75 x 18 mm Protecta FR Pipe Wrap, fitted central	None	EI 120 C/C

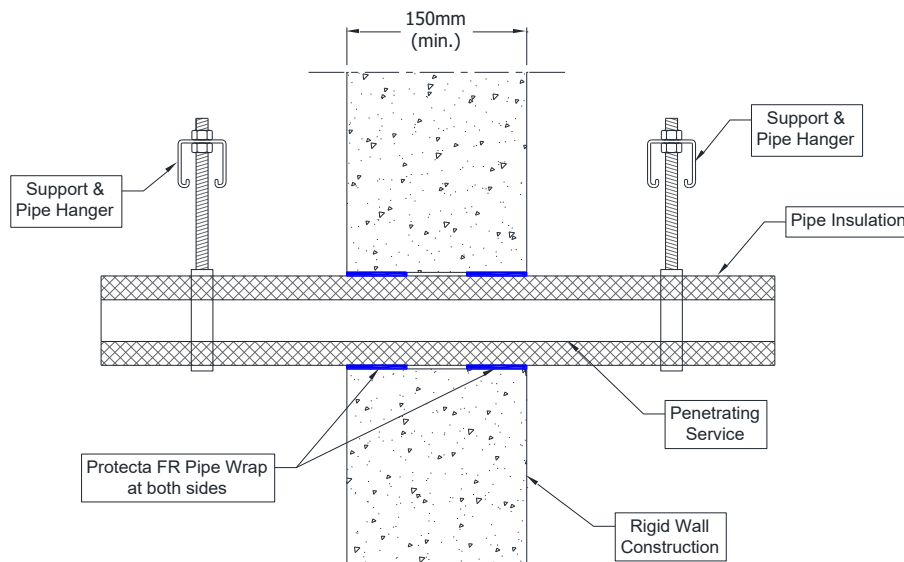


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Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: LS (Local Sustained) or CS (Continuous Sustained) insulated metallic and composite pipes with Protecta FR Pipe Wraps fitted around the pipe insulation, cast or friction fitted within the wall. Minimum separation and maximum aperture according to C.1.3).

Construction details:



Penetration seal with pipes

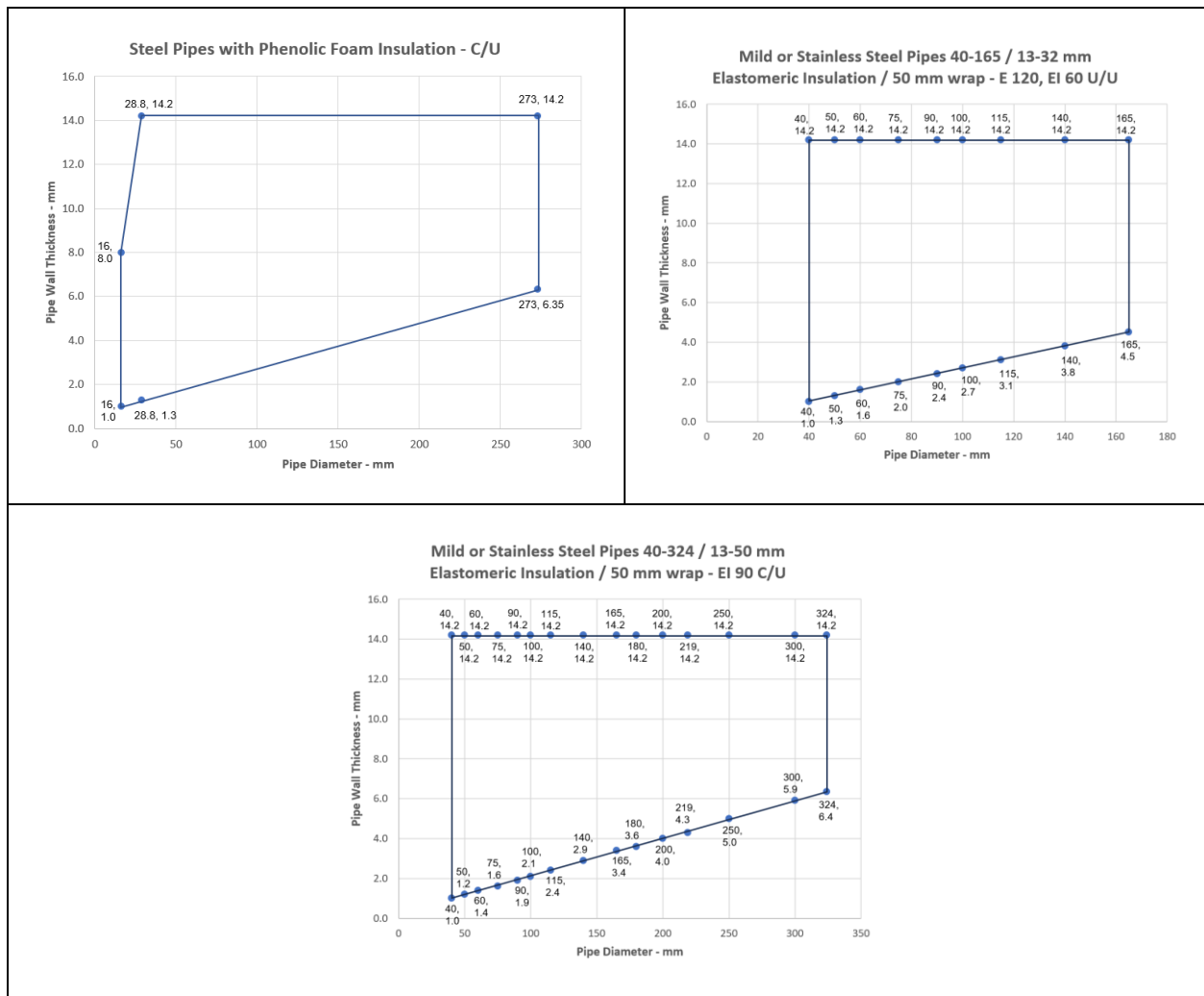
Services	Wrap	Insulation	Classification
Mild or stainless steel pipe			
16 mm diameter/1.0 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to both sides of the wall	15 mm phenolic foam insulation (CS)	EI 90 C/U
16-273 mm diameter/1.0-14.2 mm wall*		25-100 mm phenolic foam insulation (CS)	
Up to 40 mm diameter/1.0-14.2 mm wall*	50 x 1.8 mm Protecta FR Pipe Wrap fitted to both sides of the wall	13 mm elastomeric insulation minimum class B-s3, d0 or PE foam insulation	EI 120 C/U
Up to 165 mm diameter/1.0-14.2 mm wall*	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	13-32 mm elastomeric insulation minimum class B-s3, d0 or PE foam insulation	E 120 U/U, EI 60 U/U
Up to 324 mm diameter/1.0-14.2 mm wall*	50 x 5.4 mm Protecta FR Pipe Wrap fitted to both sides of the wall	32-50 mm elastomeric insulation minimum class B-s3, d0 or PE foam insulation	EI 90 C/U



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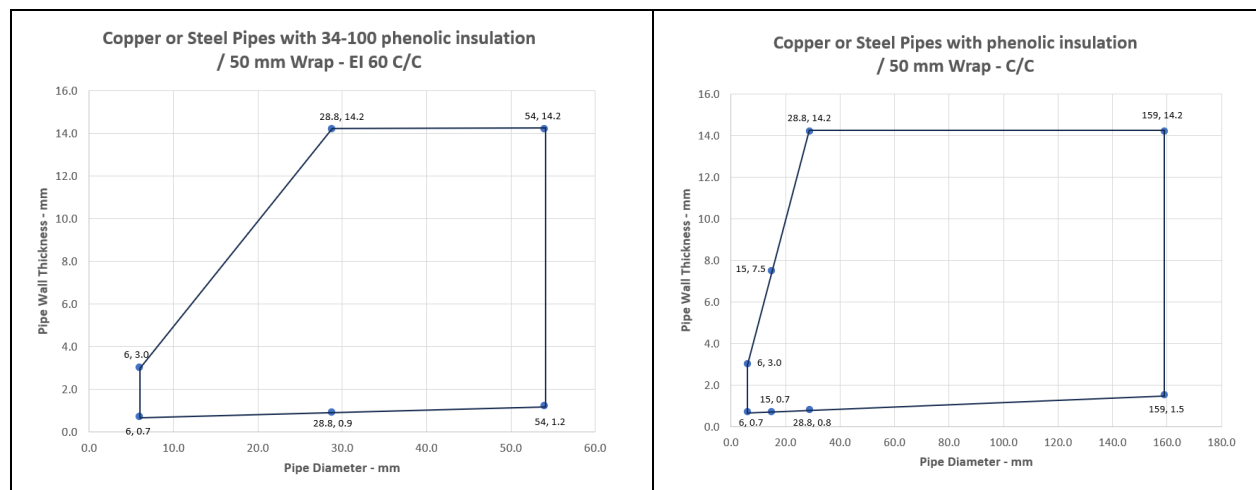
Solutions

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Services	Wrap	Insulation	Classification
Copper and steel pipe			
6-54 mm diameter/0.7-1.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	13-25 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation (LS)	E 120 C/C, EI 60 C/C
15 mm diameter/0.7 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to both sides of the wall	15 mm phenolic insulation (CS)	E 120 C/C, EI 90 C/C
6-54 mm diameter/0.7-14.2 mm wall*		34-100 mm phenolic insulation (CS)	EI 60 C/C
55-159 mm diameter/0.7-14.2 mm wall*		100 mm phenolic insulation (CS)	EI 60 C/C
6-159 mm diameter/0.7-14.2 mm wall*		15 mm phenolic insulation (CS)	E 120 C/C, EI 30 C/C
6-159 mm diameter/0.7-14.2 mm wall*		16-99 mm phenolic insulation (CS)	E 60 C/C, EI 30 C/C
6-54 mm diameter/0.7-14.2 mm wall*	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	40 mm PU foam insulation (CS)	E 120 C/C, EI 60 C/C

*See below graph for interpolation pipe sizes



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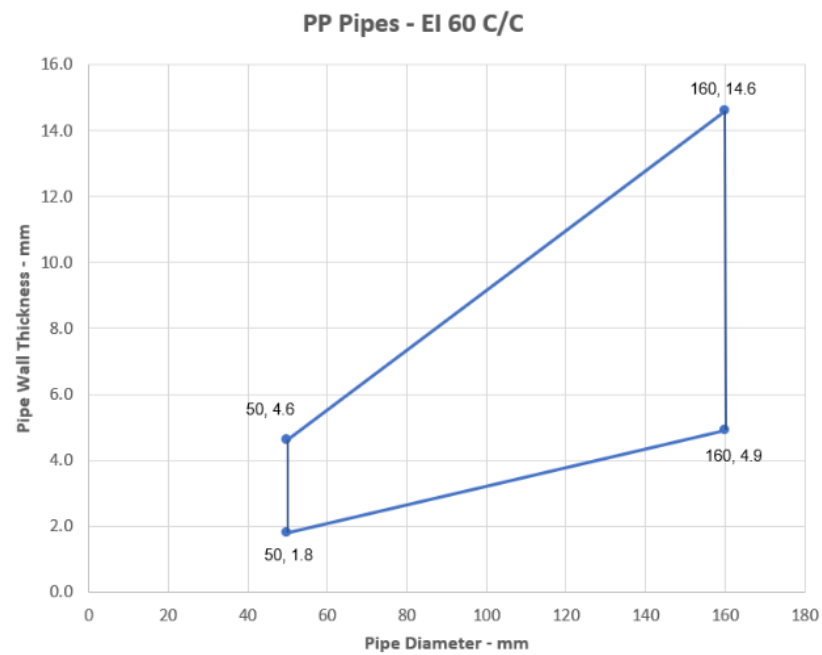
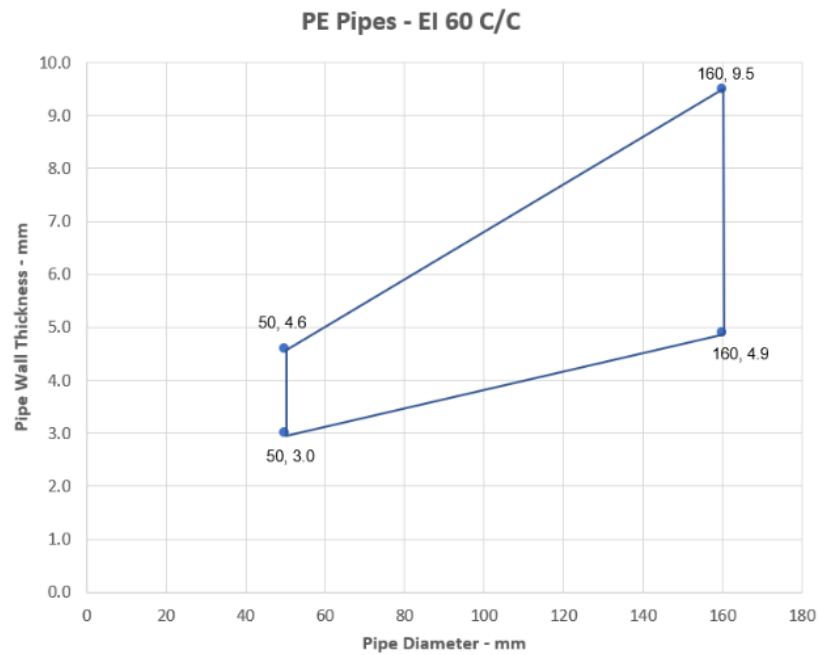
Services	Wrap	Insulation	Classification
Alupex pipe			
16 mm diameter/2.25 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	9-25 mm elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 120 C/C
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall			
32 mm 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			
25 mm diameter/2.5 mm wall		13 mm polyethylene foam with plastic sheaving	E 90 C/C, EI 60 C/C

Services	Outer diameter including insulation	Pipe wrap	Pipe insulation	Classification
PE pipe according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	9-50 mm Elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 60 C/C
	Maximum 178 mm diameter	50 x 10.8 mm Protecta FR Pipe Wrap fitted to both sides of the wall		
	Maximum 260 mm diameter	50 x 18.0 mm Protecta FR Pipe Wrap fitted to both sides of the wall		
PP pipe according to EN 1852-1: 2009				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm Protecta FR Pipe Wrap fitted to both sides of the wall	9-50 mm Elastomeric insulation minimum class B-s3, d0 or PE Foam insulation	EI 60 C/C
	Maximum 178 mm diameter	50 x 10.8 mm Protecta FR Pipe Wrap fitted to both sides of the wall		
	Maximum 260 mm diameter	50 x 18.0 mm Protecta FR Pipe Wrap fitted to both sides of the wall		

*See below graph for interpolation pipe sizes



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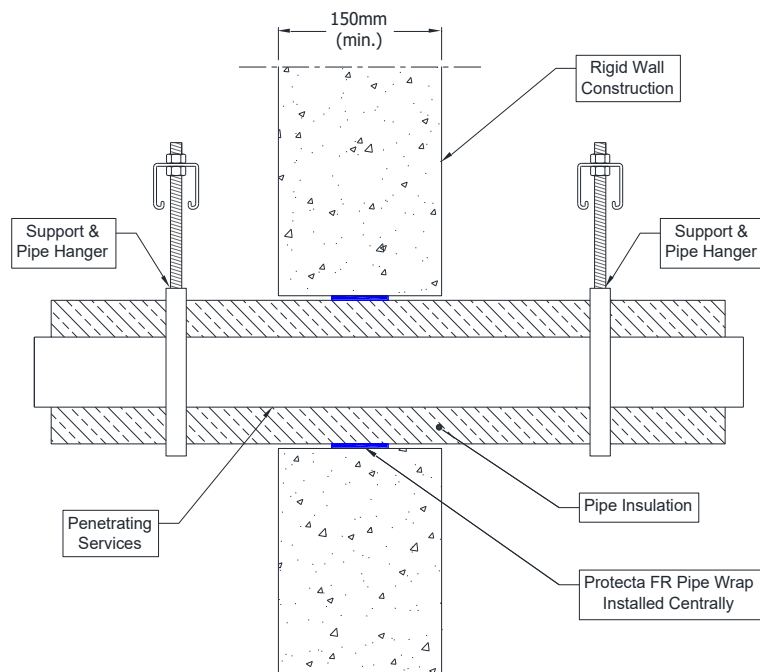


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Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes with Protecta FR Pipe Wraps fitted around the pipe insulation, cast or friction fitted within the wall. Minimum separation and maximum aperture according to C.1.3).

Construction details:



Penetration seal with pipes

Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
40 mm diameter/1.5-14.2 mm wall	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	13 mm Elastomeric insulation minimum class B-s3,d0	EI 240 C/U
Up to 40 mm diameter/1-14.2 mm wall	1 off 50 x 1.8mm Protecta FR Pipe Wrap, fitted central		EI 120 U/U
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 1.8mm Protecta FR Pipe Wrap, fitted central	13 -19 mm Elastomeric insulation minimum class B-s3,d0	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*			

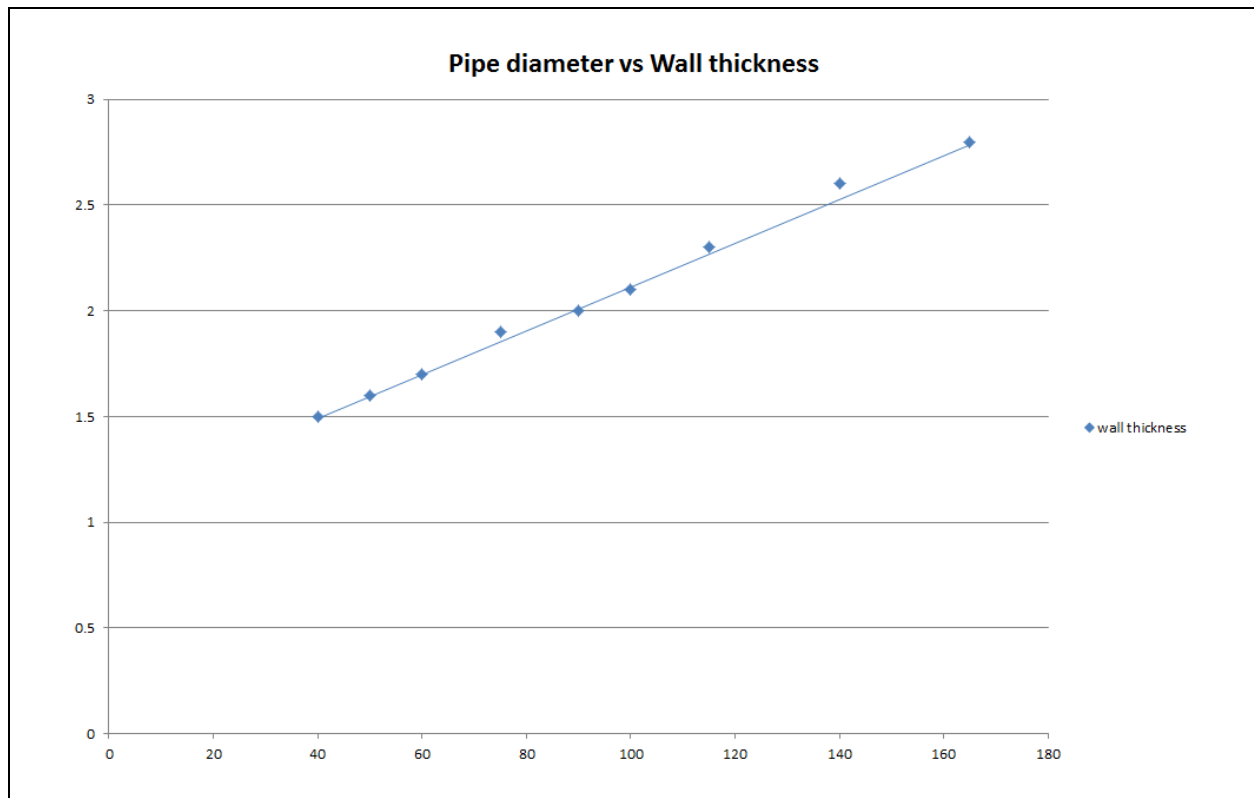
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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Services	Wrap	Insulation	Classification
Mild or stainless steel pipes			
40 mm diameter/1.5-14.2 mm wall*	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	13-25 mm Elastomeric insulation minimum class B- s3,d0	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*			

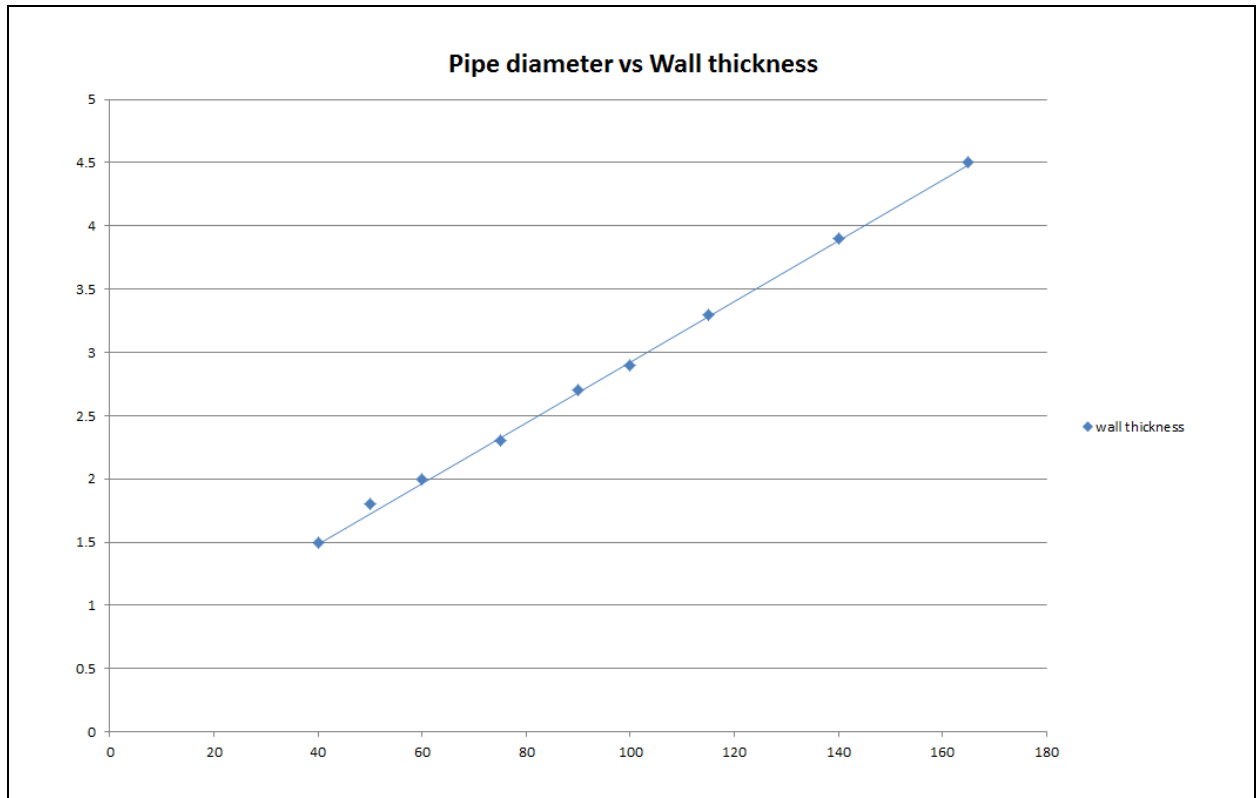
* Typical pipe diameters shown, see below graph for intermediate sizes



Solutions

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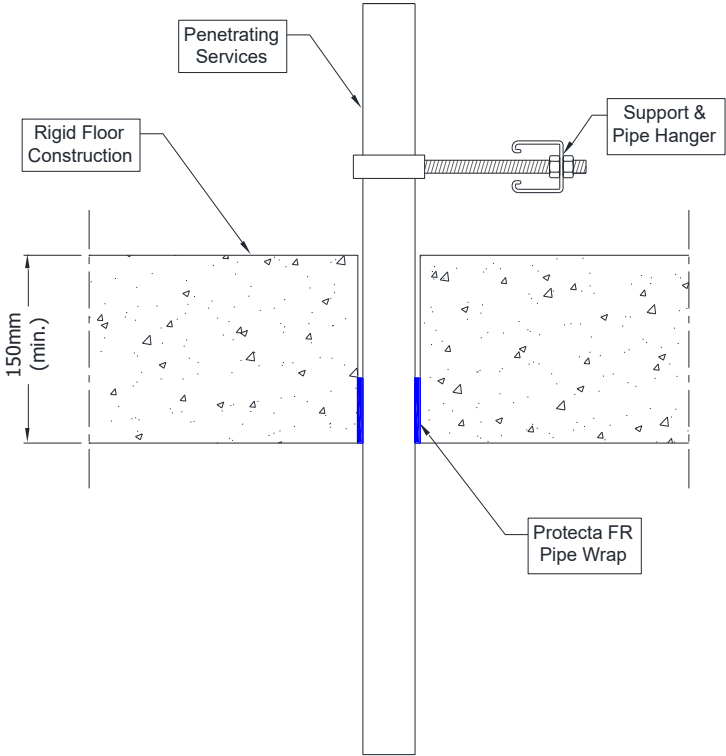
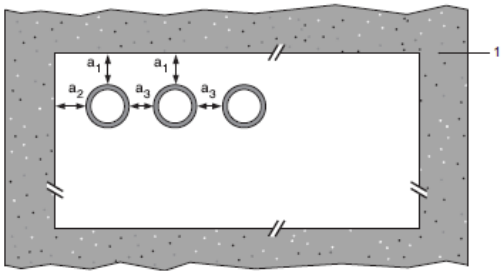
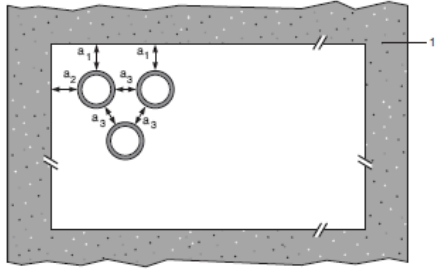
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Rigid floor constructions according to C.1.1) with floor thickness of minimum 150 mm

Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: Plastic pipes with Protecta FR Pipe Wraps fitted around the pipe, cast or friction fitted within the floor. Minimum separation and maximum aperture according to C.1.3).	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction a1 Pipe / top edge of seal separation a2 Pipe / side edge of seal separation a3 Pipe / pipe separation	



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Penetration seal with pipes

Services	Wrap	Maximum aperture	Classification
PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1			
Up to 40 mm diameter / 1.8-3.7 mm wall*	50 x 1.8 mm	As section C.1.3)	E 180 U/U, EI 120 U/U
Up to 80 mm diameter / 1.8-5.3 mm wall*	50 x 3.6 mm		EI 240 U/C
Up to 110 mm diameter / 2.4-6.6 mm wall*	50 x 3.6 mm		EI 240 U/C
Up to 125 mm diameter / 4.8-7.4 mm wall*	50 x 7.2 mm		EI 60 U/U
Up to 125 mm diameter / 2.6-7.4 mm wall*	50 x 7.2 mm		EI 120 U/C
Up to 160 mm diameter / 9.5 mm wall*	75 x 10.8 mm		E 120 U/U, EI 30 U/U
Up to 160 mm diameter / 3.2 mm wall	50 x 10.8 mm		EI 120 U/C
Up to 160 mm diameter / 3.3-4.4 mm wall	50 x 10.8 mm		EI 90 U/C
Up to 160 mm diameter / 4.5-9.5 mm wall*	50 x 10.8 mm		EI 120 U/C
Up to 160 mm diameter / 3.3-4.4 mm wall*	50 x 10.8 mm		EI 120 C/C
Up to 160 mm diameter / 4.5 mm wall	50 x 10.8 mm		EI 240 C/C
Up to 200 mm diameter / 4.9-11.9 mm wall*	75 x 10.8 mm		EI 120 C/C
Up to 315 mm diameter / 7.7-12.1 mm wall*	75 x 18.0 mm		EI 90 C/C
Up to 400 mm diameter / 15.3 mm wall*	75 x 28.8 mm		EI 60 C/C
Up to 110 mm diameter bundles containing pipes up to 20 mm diameter/ 1.0-1.5 mm wall, with or without up to 14 mm Ø cables (may be combined with PP and PE conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 2.4-6.6 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables*	50 x 3.6 mm		EI 120 U/C
PP pipes according to EN 1451-1			
Up to 40 mm diameter /1.8-5.5 mm wall*	50 x 1.8 mm	As section C.1.3)	EI 120 U/U
Up to 50 mm diameter /2.5-5.5 mm wall*	50 x 3.6 mm		EI 240 C/C
Up to 75 mm diameter /3.5-5.5 mm wall*	50 x 3.6 mm		EI 240 C/C
Up to 110 mm diameter /2.7-6.3 mm wall	50 x 3.6 mm		EI 240 U/C
Up to 125 mm diameter /11.4 mm wall*	50 x 7.2 mm		EI 240 U/U
Up to 125 mm diameter /3.4-11.4 mm wall	50 x 7.2 mm		EI 240 U/C
Up to 160 mm diameter /4.9-14.6 mm wall	50 x 10.8 mm		EI 240 U/C
Up to 200 mm diameter / 4.9-18.2 mm wall*	75 x 10.8 mm		EI 240 C/C
Up to 315 mm diameter / 7.7-28.6 mm wall*	75 x 18.0 mm		EI 60 C/C
Up to 400 mm diameter / 22.7 mm wall*	75 x 28.8 mm		EI 60 C/C
Up to 110 mm diameter bundles containing pipes up to 20 mm diameter/ 1.9 mm wall, with or without up to 14 mm Ø cables (may be combined with PVC and PE conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 3.4-6.3 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables	50 x 3.6 mm		EI 60 U/C

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



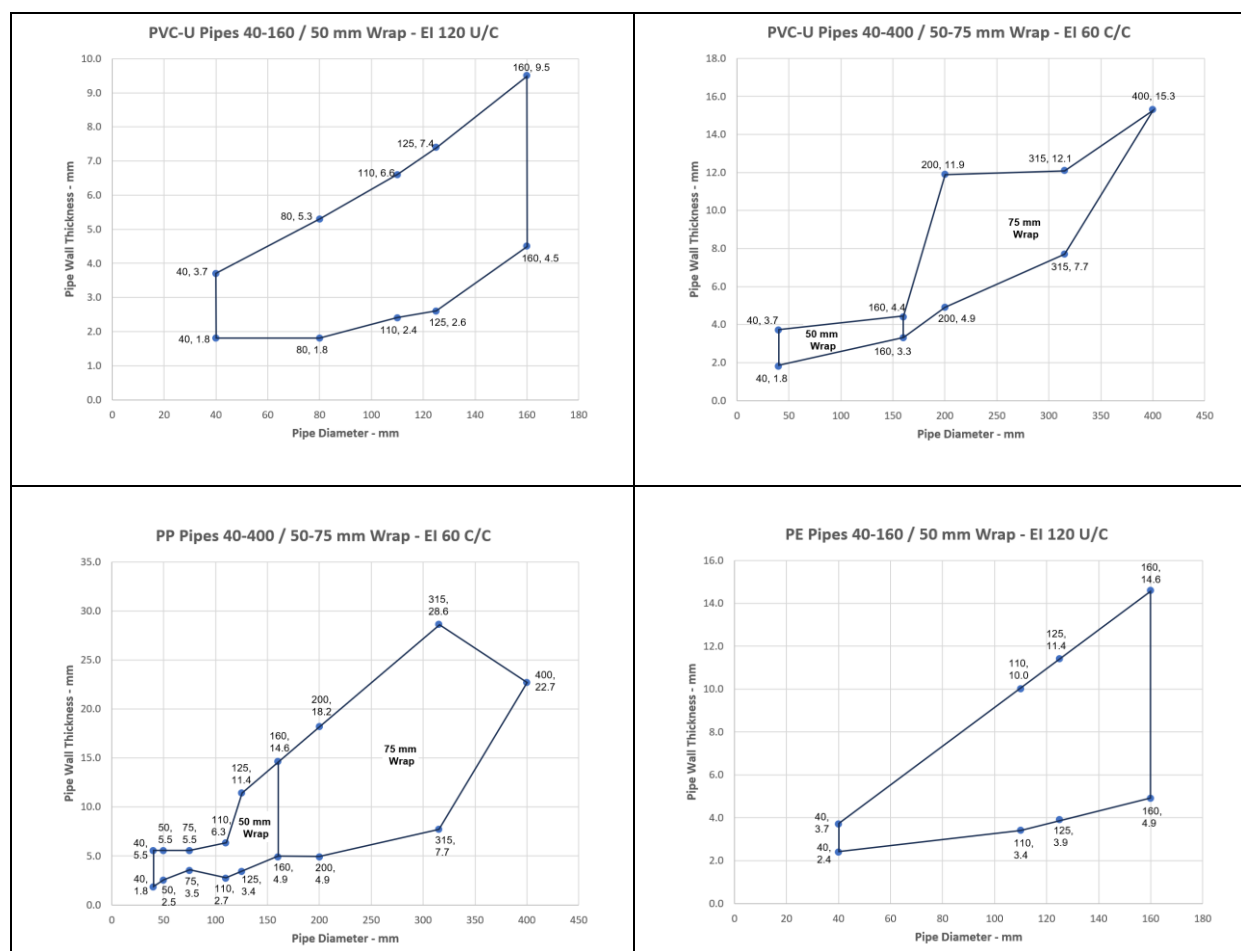
Solutions

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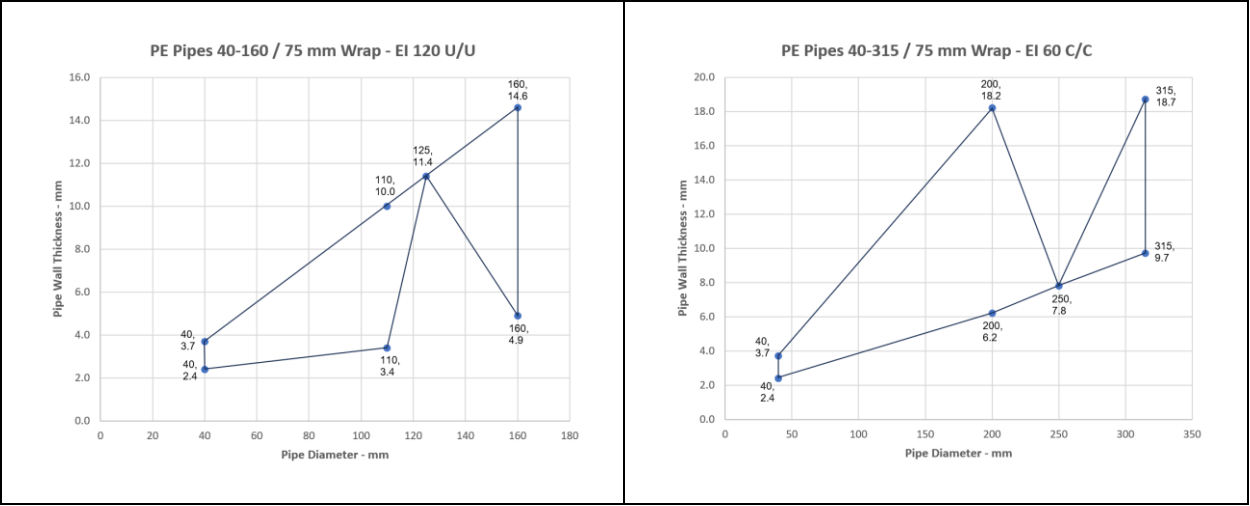
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Services	Wrap	Maximum aperture	Classification
PE pipes according to EN 1519-1, EN 12201-2 and EN 12666-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1			
Up to 40 mm diameter / 2.4-3.7 mm wall*	50 x 1.8 mm	As section C.1.3)	EI 240 U/U
Up to 110 mm diameter / 3.4-10.0 mm wall*	50 x 3.6 mm		EI 120 U/C
Up to 110 mm diameter / 3.4-10.0 mm wall*	75 x 5.4 mm		EI 240 U/U
Up to 125 mm diameter / 3.9-11.4 mm wall*	50 x 7.2 mm		EI 240 U/C
Up to 125 mm diameter / 11.4 mm wall*	50 x 7.2 mm		EI 240 U/U
Up to 160 mm diameter / 4.9-14.6 mm wall*	50 x 10.8 mm		EI 120 U/C
Up to 160 mm diameter / 4.9-14.6 mm wall*	75 x 7.2 mm		EI 120 U/U
Up to 200 mm diameter / 6.2-18.2 mm wall*	75 x 10.8 mm		EI 120 C/C
Up to 250 mm diameter / 7.8 mm wall*	75 x 12.6 mm		EI 180 C/C
Up to 315 mm diameter / 9.7-18.7 mm wall*	75 x 18.0 mm		EI 60 C/C
Up to 110 mm diameter bundles containing pipes up to 32 mm diameter/ 2.0-2.3 mm wall, with or without up to 14 mm Ø cables (may be combined with PVC and PP conduits)	50 x 3.6 mm		E 90 U/U, EI 60 U/U
Up to 110 mm diameter/ 2.7-10.0 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø cables	50 x 3.6 mm		E 120 U/C, EI 60 U/C

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

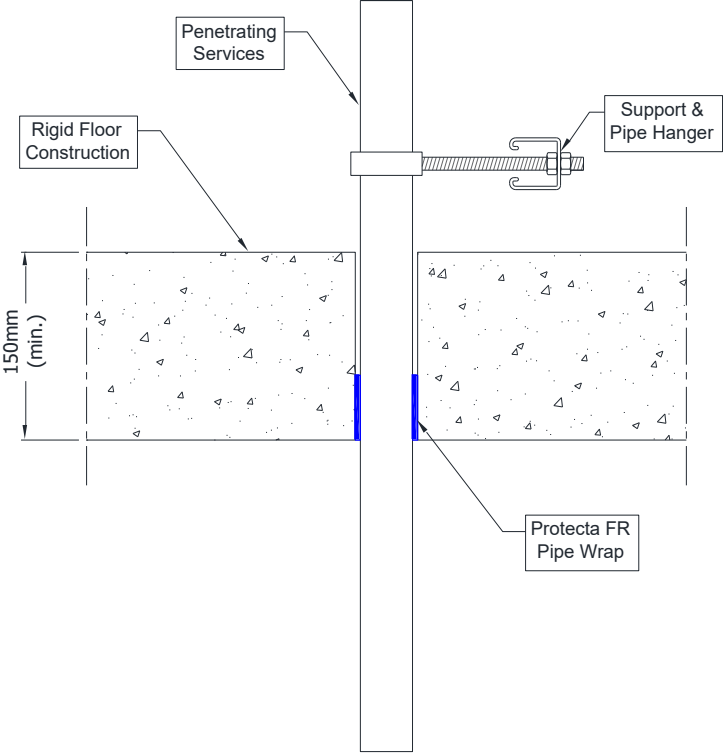
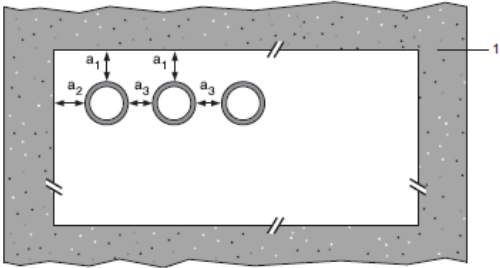
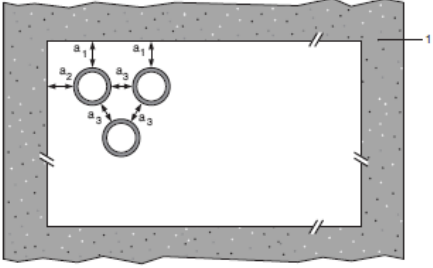


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Appendix UL-EU CERTIFICATE UL-EU-00915-EN

Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: Plastic pipes with Protecta FR Pipe Wraps fitted around the pipe, cast or friction fitted within the floor. Minimum separation and maximum aperture according to C.1.3).	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction - a1 Pipe / top edge of seal separation - a2 Pipe / side edge of seal separation - a3 Pipe / pipe separation	



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Services	Wrap (soffit side)	Permitted configuration for seal separation	Classification
PEX pipe in pipe systems according to ISO 15875			
Maximum 54 mm diameter/0.4 mm wall thickness (outer pipe), 28 mm diameter/4.0 mm wall thickness (inner pipe)	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 C/C
Maximum 25 mm diameter/0.6 mm wall thickness (outer pipe), 15 mm diameter/2.5 mm wall thickness (inner pipe), single, or in bundles maximum 50 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
Rehau Raupiano Plus PP-DD according to DIN 4102			
40-50 mm diameter/1.8-2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/2.7 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.1 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	E 240 U/C, EI 120 U/C
160 mm diameter/3.9 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 120 U/C
Polo-Kal NG Poloplast PP-MV according to DIN 4102			
32-50 mm diameter/2.0 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
51-110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 180 U/C
125 mm diameter/3.9 mm wall thickness	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	EI 240 U/C
160 mm diameter/4.3 mm wall thickness	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Aquatherm Green SDR9 MF PP-RP according to ISO 21003			
32 mm diameter/3.6 mm wall thickness	50 x 1.8 mm (1 x 1.8 layer)	1 & 2	EI 240 C/C
40-50 mm diameter/5.6-12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
63-110 mm diameter/12.3 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 C/C
Wavin SiTech + PP-M B according to EN 13501-1			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
Geberit Silent PP according to DIN 4102			
32-50 mm diameter/1.8-3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter/3.4 mm wall thickness*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.9 mm wall thickness *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 120 U/C
160 mm diameter/4.9 mm wall thickness*	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C

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



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Services	Wrap (soffit side)	Permitted configuration for seal separation	Classification
BluePower Multilayer pipes according to EN 1451-1			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
125 mm diameter/3.9 mm wall thickness*	50 x 7.2 mm (4 x 1.8 layers)	1 & 2	EI 120 U/C
160 mm diameter/4.9 mm wall thickness*	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Uponor Decibel pipes according to EN 14366			
32-50 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/U
75-110 mm diameter*	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
Wavin AS+ pipes according to EN 12056 and DIN 1986-100			
32-50 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/U, EI 60 U/U, EI 240 U/C
75-110 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 120 U/C, EI 60 U/C, EI 240 C/C
125-200 mm diameter *	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 C/C
Huliot Ultra Silent pipe according to EN 1451-1 and DIN 1986-100			
32-50 mm diameter/1.8 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 60 U/U
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	E 240 U/C, EI 180 U/C
200 mm diameter/6.2 mm wall thickness	75 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 C/C
Valsir PP3 pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/2.7 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C
Valsir Blackfire pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C

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



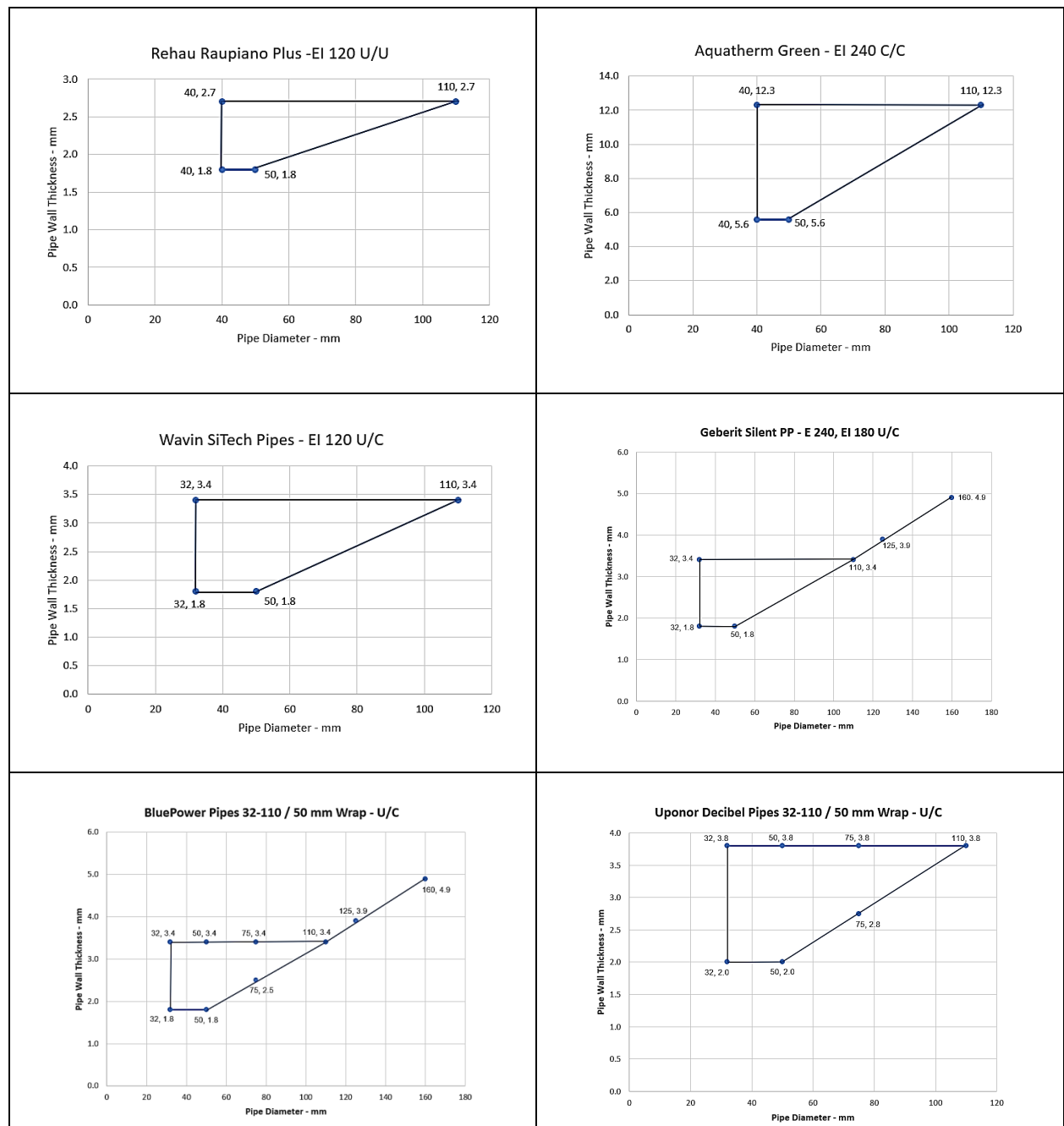
Solutions

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Appendix UL-EU CERTIFICATE UL-EU-00915-EN

Services	Wrap (soffit side)	Permitted configuration for seal separation	Classification
Valsir Triplus pipe according to EN 1451-1			
32-50 mm diameter/1.8 mm wall thickness *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	E 240 U/U, EI 120 U/C
75-90 mm diameter *	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 120 U/C
110 mm diameter/3.4 mm wall thickness	50 x 3.6 mm (2 x 1.8 layers)	1 & 2	EI 240 U/C
125-160 mm diameter *	50 x 10.8 mm (6 x 1.8 layers)	1 & 2	EI 240 U/C

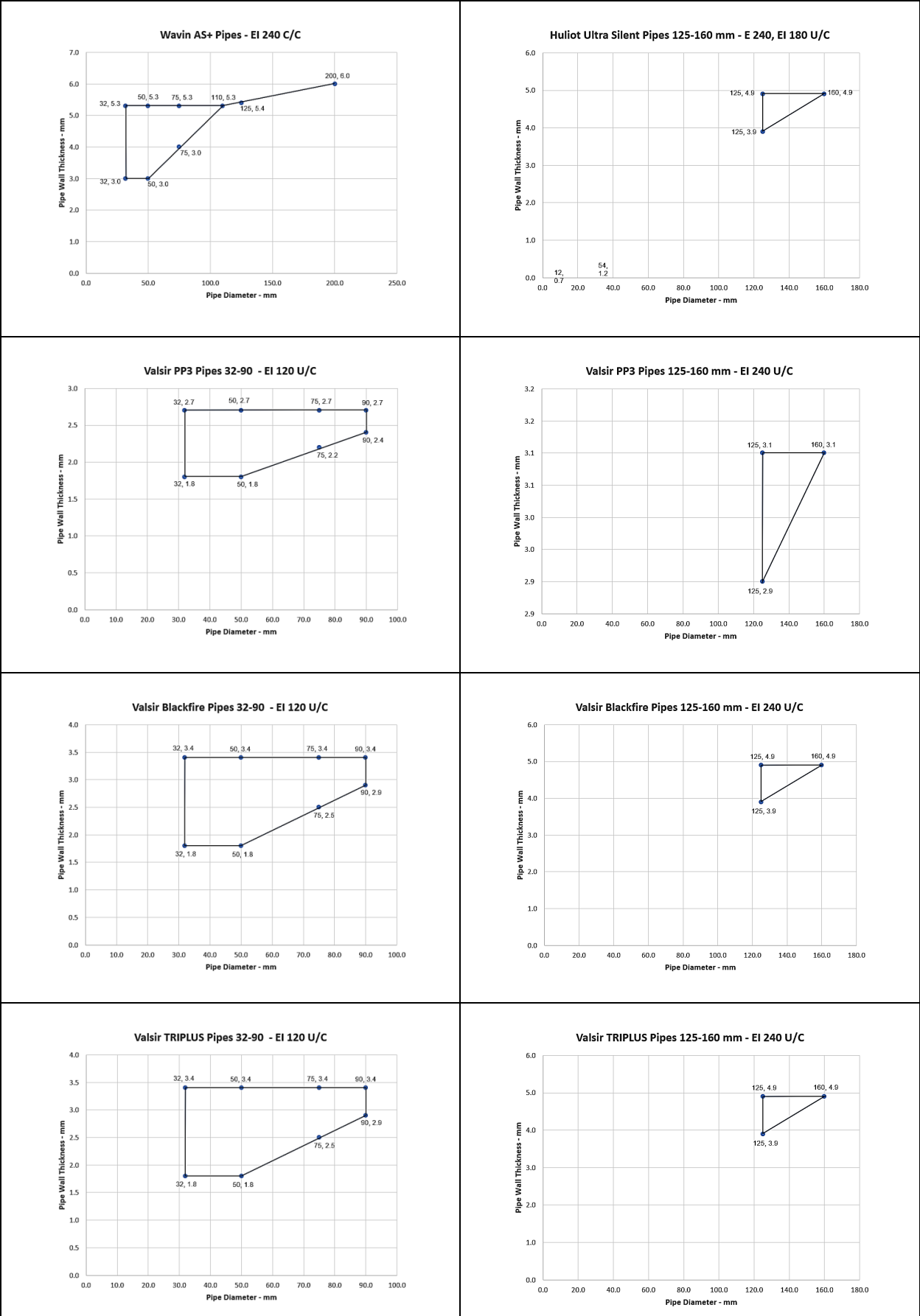
* Typical pipe diameters shown, see below graph for intermediate sizes



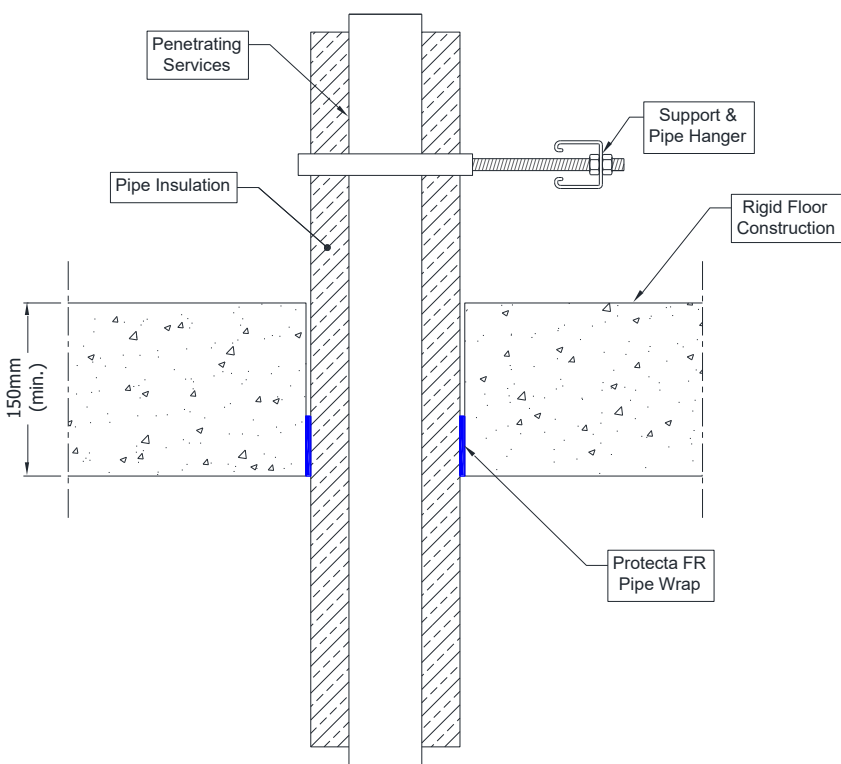
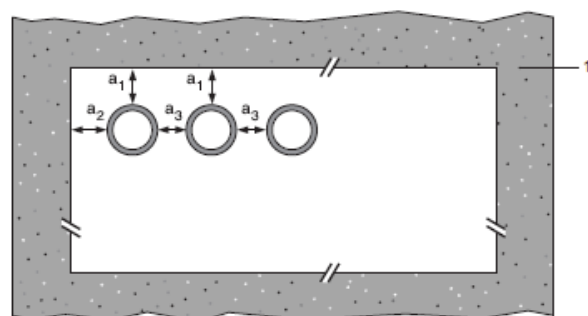
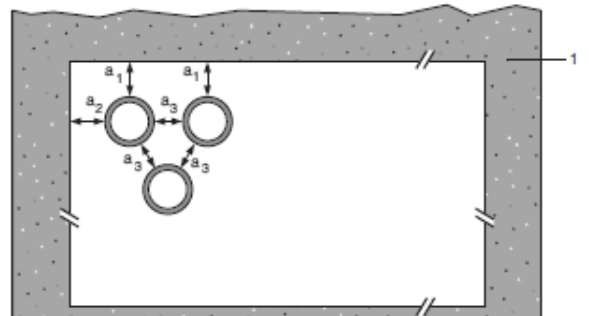
Solutions

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Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes with Protecta FR Pipe Wraps fitted around the pipe insulation, cast or friction fitted within the floor. Minimum separation and maximum aperture according to C.1.3).	
Construction details: 	
Configuration 1: 	Configuration 2: 
Key 1 Supporting construction - a1 Pipe / top edge of seal separation - a2 Pipe / side edge of seal separation - a3 Pipe / pipe separation	

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Penetration seal with pipes

Services	Wrap	Insulation	Classification
Copper and steel pipes			
12 mm diameter/≥1 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	9 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/C
12-54 mm diameter/≥1 mm wall		19 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 180 C/C, EI 120 C/C
12-54 mm diameter/1 mm wall		9-18 & 20-25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 180 C/C, EI 60 C/C
12-54 mm diameter/1 mm wall		25 mm foil faced Phenolic Foam insulation	E 180 C/C, EI 120 C/C
12-159 mm diameter/≥1 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	100 mm Phenolic Foam insulation	EI 45 C/C
12-54 mm diameter/1 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	40 mm PU Foam insulation	E 120 C/C, EI 60 C/C
Mild or stainless steel pipes			
≤40 mm diameter/1.5-14.2 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	13 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 180 C/U
≤165 mm diameter/2.8-14.2 mm wall*		13 -19 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 180 C/U, EI 120 C/U
≤40 mm diameter/1-14.2 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	25 mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/U
≤324 mm diameter/1-14.2 mm wall*		25mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 240 C/U EI 120 C/U
≤324 mm diameter/1-14.2 mm wall*	50 x 5.4 mm Protecta FR Pipe Wrap fitted to the soffit	25-50mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 120 C/U
≤12 mm diameter/1.0 mm wall	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	9 mm thick PE foam insulation	EI 180 C/U
≤76 mm diameter/1.5-14.2 mm wall*	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	9-30mm thick PE foam insulation	E 180 C/U EI 60 C/U

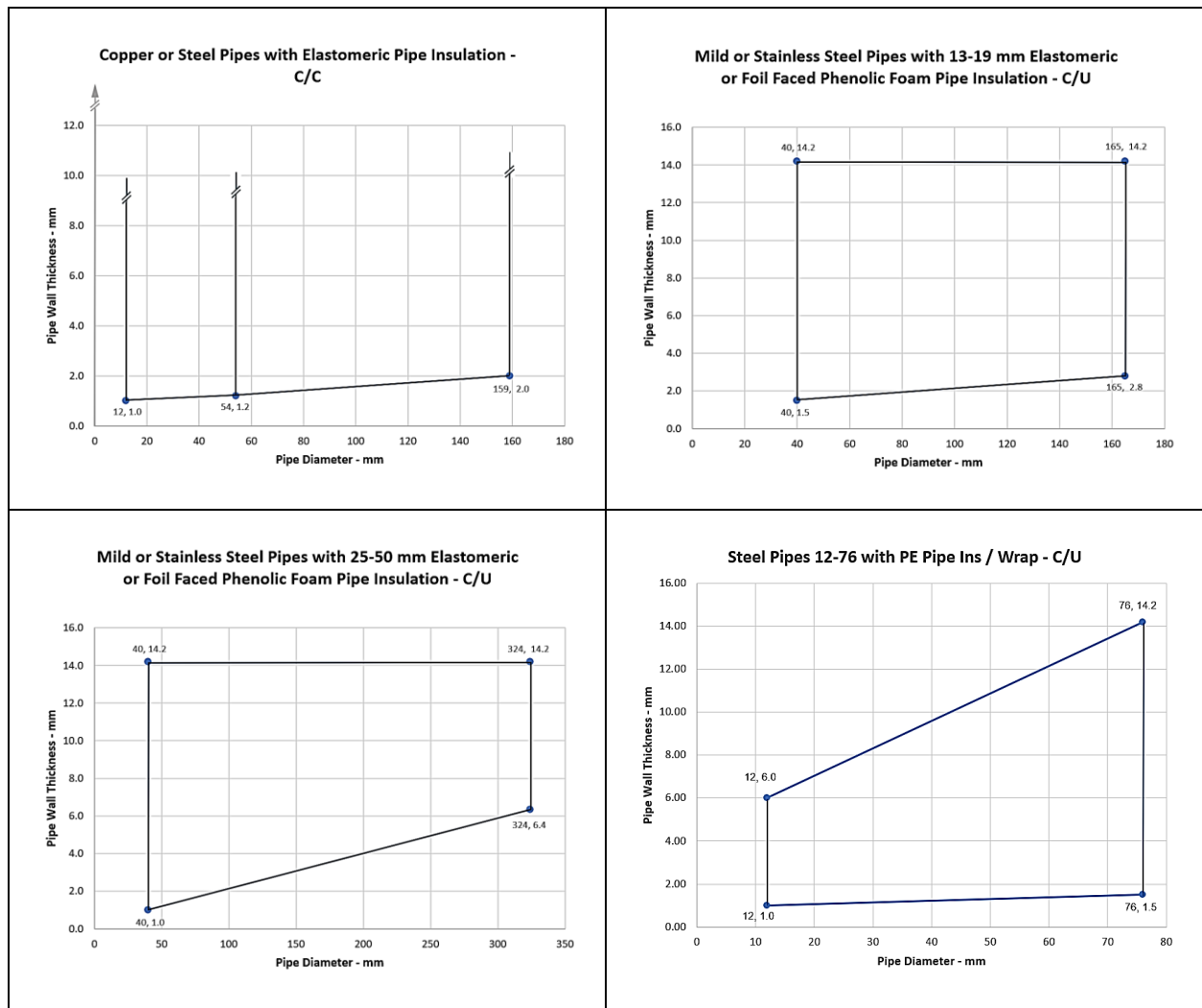
* Typical pipe diameters shown, see below graph for intermediate sizes



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Services	Wrap	Insulation	Classification
Alupex pipes			
16 mm diameter/2.25 mm wall	50 x 3.6 mm Protecta FR Pipe Wrap fitted to the soffit	9 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 240 C/C
16 mm diameter/2.25 mm wall		9-13 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	E 240 C/C, EI 180 C/C
20 mm diameter/2.25 mm wall			
25 mm diameter/2.5 mm wall			
16 mm diameter/2.25 mm wall		9-24 mm Elastomeric insulation minimum class B-s3,d0	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		9-24 mm foil faced Phenolic Foam insulation	E 180 C/C, EI 90 C/C
63 mm diameter/4.5 mm wall			
75 mm diameter/4.7 mm wall			
16 mm diameter/2.25 mm wall			
20 mm diameter/2.5 mm wall			
26 mm diameter/3 mm wall		25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	EI 180 C/C
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		25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	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			
Alupex pipe inside a PP conduit e.g. LK Pal Universal pipes with additional PE insulated conduit, PiP Extra			
Outer PP conduit up to 42 mm diameter/2.0-2.5 mm wall with inner alupex pipe up to 32 mm diameter/2.0-3.0 mm wall*	50 x 1.8 mm Protecta FR Pipe Wrap fitted to the soffit	10 mm PE foam insulation	E 240 C/C, EI 120 C/C

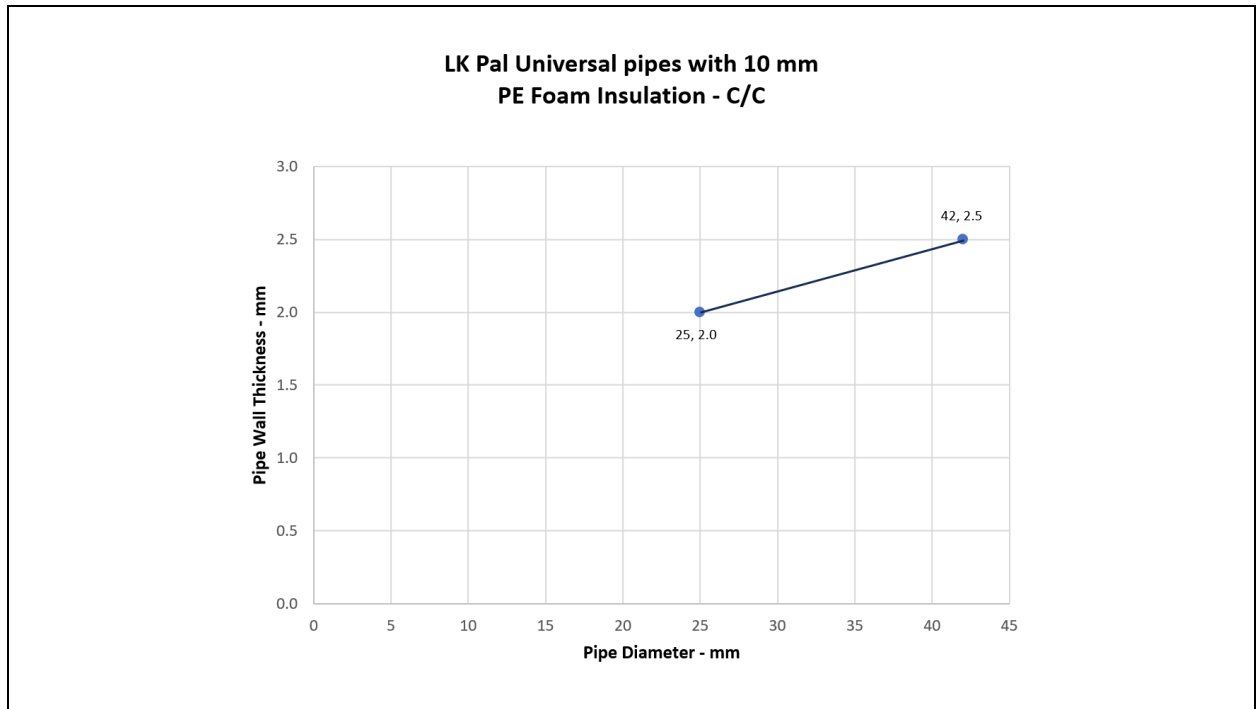
* Typical pipe diameters shown, see below graph for intermediate sizes



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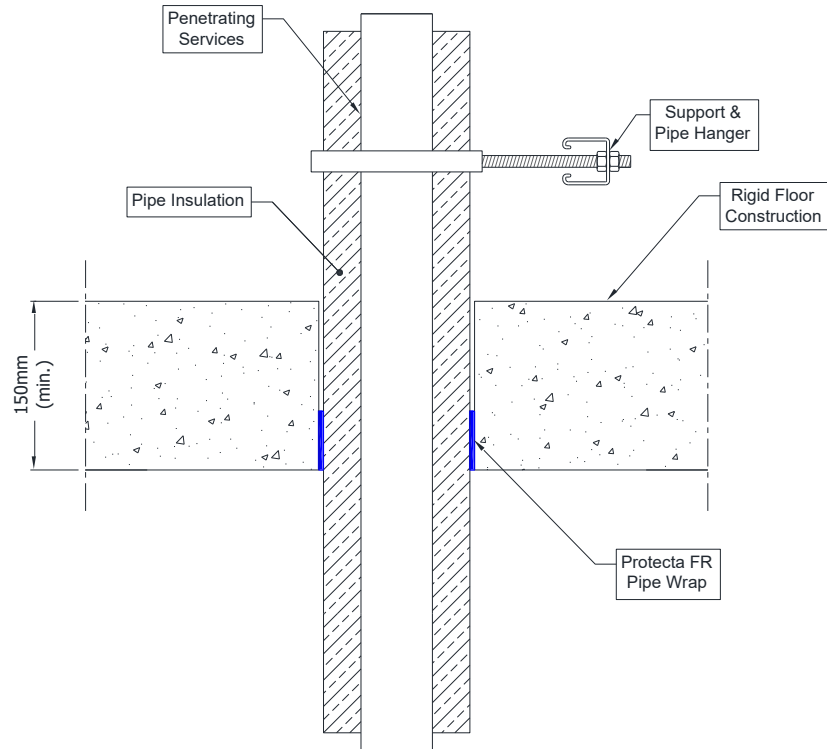


Appendix UL-EU CERTIFICATE UL-EU-00915-EN

Pipe penetration seal with Protecta FR Pipe Wrap

Penetration Seal: CS (Continuous Sustained) insulated plastic pipes with Protecta FR Pipe Wraps fitted around the pipe insulation, cast or friction fitted within the floor. Minimum separation and maximum aperture according to C.1.3).

Construction details:



Penetration seal with pipes

Services	Outer diameter including insulation	Pipe wrap (soffit side)	Pipe insulation	Classification
PE pipes according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	EI 240 C/C
	Maximum 178 mm diameter	75 x 10.8 mm (6 x 1.8 layers)		
	Maximum 260 mm diameter	75 x 18.0 mm (10 x 1.8 layers)		EI 120 C/C
PP pipes according to EN 1852-1: 2009				
Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	50 x 3.6 mm (2 x 1.8 layers)	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	E 240 C/C, EI 180 C/C
	Maximum 178 mm diameter	75 x 10.8 mm (6 x 1.8 layers)		EI 240 C/C
	Maximum 260 mm diameter	75 x 18.0 mm (10 x 1.8 layers)		EI 120 C/C

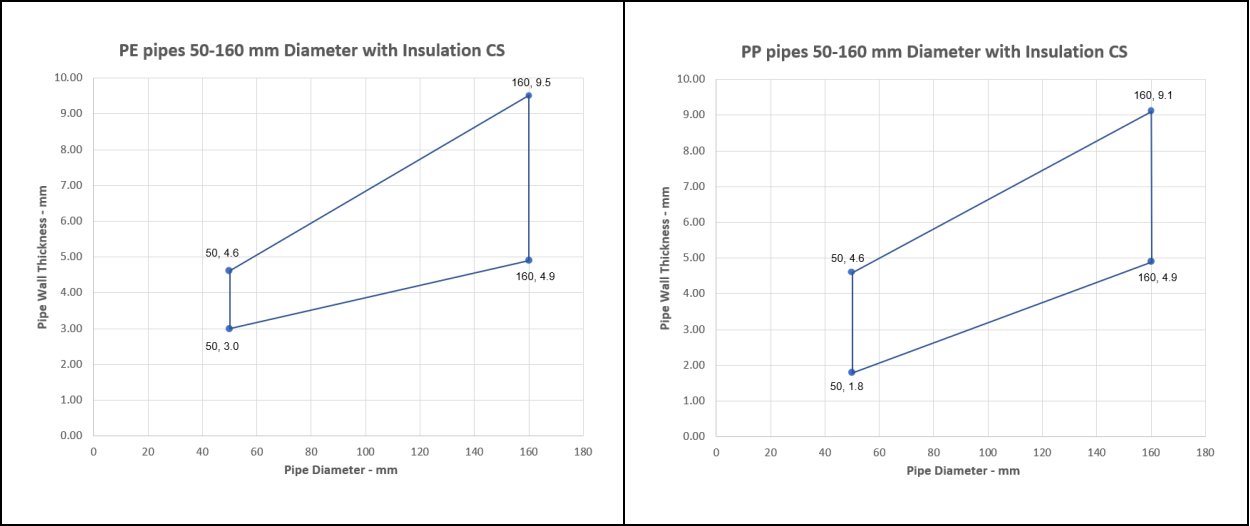
*See below graph for interpolation pipe sizes



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The UL-EU Marks, displayed below represent the enhanced and alternate version of the product marking. Either Mark can be used. These Marks shall appear on certified products only. Minimum size is not specified, as long as the Mark is legible. The following is suggested.



*Note: E12345 is an example of the UL file number.

The minimum height of the registered trademark symbol ® shall be 1 mm. When the overall diameter of the UL-EU Mark is less than 9.5 mm, the trademark symbol may be omitted if it is not legible to the naked eye.

The UL-EU Mark may appear on a label, nameplate, or may be cast, stamped or molded into the product. When appearing on a label or nameplate, the Manufacturer's name or trademark along with a model number and UL File number are also required on that same label or nameplate. If cast, stamped or molded, the Manufacturer's name or trademark and model number shall also appear elsewhere on the product.

All content shall be in accordance with the details provided on this UL-EU Certificate.

PROCUREMENT

The Production site may reproduce the Mark or obtain it from a UL authorized supplier. The list of UL authorized suppliers can be found on UL's online directory at www.ul.com.



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