

UL-EU CERTIFICATE

Certificate No. UL-EU-00911-CPR
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Date of Issue 2015-10-09
Revised 2020-08-11

Certificate Holder Polyseam Ltd
15 St Andrews Road
Huddersfield
West Yorkshire
HD1 6SB
United Kingdom

Manufacturer Polyseam Ltd
15 St Andrews Road
Huddersfield
West Yorkshire
HD1 6SB
United Kingdom

Certified Product Type Fire Stop – Mortar
Product Trade Name Protecta EX Mortar
Trademark N/A
Rating/Classification See Appendix

Harmonised Technical Specifications
Supporting Documentation

EAD 350454-00-1104, September 2017 / EN 13501-2
ETA 13/0672, EC – CERTIFICATE OF CONSTANCY OF
PERFORMANCE - 0843 – CPR – 0138, Classification
report No. 13CA21782 C/ 4786594904 A Issue 2 /
Classification report No. 4787998082 and Classification
report No. 4789231572

Additional information
Expiry date

Additional test evidence is held on file
2025-10-08



Authorized Certification Decision Maker
Chris Miles

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shall remain valid through the Expiration date, unless a Standard identified on this Certificate is amended or withdrawn prior to that date or there is a non-compliance with the Agreement.



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This certificate relates to the use of Protecta EX Mortar for fire stopping where there are service penetrations through floors and walls. The detailed scope is given in pages 3 to 43 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 certificated on the basis of:

- i) ETA 13/0672
- ii) EC – CERTIFICATE OF CONSTANCY OF PERFORMANCE - 0843 – CPR – 0138
- iii) Inspection and surveillance of factory production control by UL
- iv) Fire resistance test data in accordance with EN 1366-3: 2009
- v) Classification in accordance with EN 13501-2
- vi) Durability and Servicability as defined in ETAG 026-2, Clause 2.4.12*

Protecta EX Mortar has been tested in accordance with the requirements of ETAG 026-2, Clause 2.4.12 to demonstrate its suitability for use in internal conditions with humidity lower than 85 % RH, excluding temperatures below 0°C, without exposure to rain or UV. These conditions are designated Z₂ in ETAG 026-2.

Protecta EX Mortar is a gypsum based mortar material, used to reinstate the fire resistance performance of wall and floor constructions where they have been provided with apertures for the penetrations of multiple services.



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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 'A1'
EN 13501-2	Resistance to fire	See pages 4 to 41
BWR 3 Hygiene, health and environment		
EN 1026	Air permeability	See pages 42 & 43
EAD 350454-00-1104, Annex C	Water permeability	No performance determined
Declaration of manufacturer & EN 16516	Release of dangerous substances	Use categories: IA1, S/W2 Declaration of manufacturer
BWR 4 Safety in use		
EOTA TR 001:2003	Mechanical resistance and stability	Suitable for use in walls and floors in Zone Types I, II, III & IV*
EOTA TR 001:2003	Resistance to impact/movement	
EOTA TR 001:2003	Adhesion	
EAD 350454-00-1104, Clause 2.2.9	Durability	Z ₂
BWR 5 Protection against noise		
EN 10140-1,2,4,5/ EN ISO 717-1	Airborne sound insulation	Rw 48 (-1;-3) dB
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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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Fire Resistance (mins.)	
								E	EI
Masonry/ Concrete	150	2400 wide x 1200 high	None	No restriction	50	Stone Mineral Wool 150 kg/m ³	50	180	120
			Electrical cables up to 21 mm Ø, (single, bundled and on trays)					180	60
			Electrical cables up to 50 mm Ø, (single, bundled and on trays)					180	45
			Electrical cables up to 80 mm Ø, (single, bundled and on trays)					120	45
			Telecom cables up to 21 mm Ø (single or bundles up to 100 mm Ø)					180	90
			Steel cable trays & ladders					180	60
			Non-sheathed wires up to 17 mm Ø					180	45
			Non-sheathed wires up to 24 mm Ø					180	30
			Copper conduits up to 16 mm Ø					180	30
			Steel conduits up to 16 mm Ø					180	60
			PVC conduits up to 16 mm Ø					180	60
			Steel pipes 219 diameter/ 5-14.2 mm wall with CS insulation of 30 mm stone wool 80 kg/m ³					120	90
		Copper or steel pipe up to 54 mm diameter/ 1-14.2 mm wall*	180					120	
		75 mm Alupex composite pipes with 7.5 mm wall with LI or CI 600 mm long, 32 mm Elastomeric insulation minimum class B-s3,d0	60					60	
		80 x 80	Single electrical cables up to 21 mm Ø					240	60
70 x 70	Copper or steel pipes up to 12 mm diameter/ 0.9-5 mm wall*	240	240						
115 x 115	Copper or steel pipes up to 54 mm diameter/ 1-14.2 mm wall*	240	120						

* with LI or CI 1000 mm long, 20 mm stone wool 80 kg/m³

All conduit classifications are end configuration C/U, except PVC which is also C/C (U=Uncapped, C=Capped).

All copper and Alupex pipe classifications are pipe end configuration C/C, all steel pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

LS = Local Sustained

CS = Continuous Sustained

LI = Local Interrupted

CI = Continuous Interrupted



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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services – Mild or stainless steel pipes with LI or CI 1000 mm long/ 30 mm Stone wool insulation, 80 kg/m ³	Seal Position	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Fire Resistance (mins.)	
								E	EI
Masonry/ Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall*	No restriction	50	Stone Mineral Wool 150 kg/m ³	50	120	90
			50 mm diameter/1.7-14.2 mm wall*						
			60 mm diameter/1.9-14.2 mm wall*						
			75 mm diameter/2.2-14.2 mm wall*						
			90 mm diameter/2.5-14.2 mm wall*						
			100 mm diameter/2.7-14.2 mm wall*						
			115 mm diameter/3-14.2 mm wall*						
			140 mm diameter/3.5-14.2 mm wall*						
			165 mm diameter/ 3.9-14.2 mm wall*						
			180 mm diameter/ 4.2-14.2 mm wall*						
			200 mm diameter/ 4.6-14.2 mm wall*						
219 mm diameter/ 5.0-14.2 mm wall*									
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services – Mild or stainless steel pipes with LI or CI 1000 mm long/ 20 mm Stone wool insulation, 80 kg/m ³	Seal Position	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Fire Resistance (mins.)	
Masonry/ Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall	No restriction	50	Stone Mineral Wool 150 kg/m ³	50	180	120
		100 x100						240	240

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Fire Resistance (mins.)	
								E	EI
Masonry/Concrete	150	2400 wide x 1200 high	None	No restriction	100	None	-	240	240
			Electrical cables up to 21 mm Ø, (single, bundled and on trays)					240	60
			Electrical cables up to 80 mm Ø, (single, bundled and on trays)					120	120
			Telecom cables up to 21 mm Ø, in ties bundles up to 100 mm Ø					120	60
			Steel cable trays & ladders					180	30
			Non-sheathed wires up to 24 mm Ø					180	60
			Copper conduits up to 16 mm Ø					240	240
			Steel conduits up to 16 mm Ø						
			PVC conduits up to 16 mm Ø						
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipes insulated with CS 13-19 mm Elastomeric insulation minimum class B-s3,d0	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)		
Masonry/Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall*	No restriction	100	1 off 50 x 1.8mm Protecta FR Pipe Wrap, fitted central	240	60	
			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*						
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipes insulated with CS 13 mm Elastomeric insulation minimum class B-s3,d0	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)		
Masonry/Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall	No restriction	100	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	240	240	
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipes insulated with CS 9 mm Elastomeric insulation minimum class B-s3,d0	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)		
Masonry/Concrete	150	2400 wide x 1200 high	165 mm diameter/4.5-14.2 mm wall	No restriction	100	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	240	30	

* Typical pipe diameters shown, intermediate sizes are possible

All conduit classifications are end configuration C/U, except PVC which is also C/C (U=Uncapped, C=Capped).
 All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipes insulated with CS 13-25 mm Elastomeric insulation minimum class B-s3,d0	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)	
							E	EI
Masonry/ Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall*	No restriction	100	1 off 50 x 3.6mm Protecta FR Pipe Wrap, fitted central	180	60
			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*								
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)	
Masonry/ Concrete	150	2400 wide x 1200 high	315 mm diameter/9.2 mm wall	No restriction	100	1 off 75 x 18 mm Protecta FR Pipe Wrap, fitted central	E	EI
							120	120

All metal pipe classifications are pipe end configuration C/U, PVC-U pipe classifications are pipe end configuration C/C (U=Uncapped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.

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 CS = Continuous Sustained
 LI = Local Interrupted
 CI = Continuous Interrupted

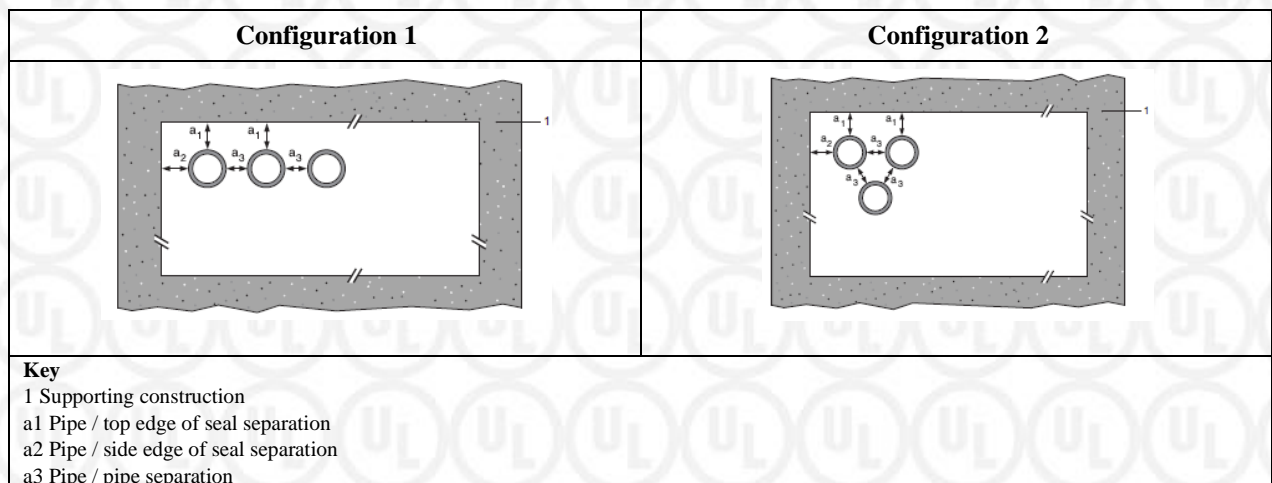


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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Services - PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Fire Resistance (mins.)	
							E	EI
Concrete	150	2400 x 1200	Diameter up to 32 mm, wall thickness 1.6 – 2.4 mm	No restriction	100	1 & 2	120	120
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Services - 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	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Fire Resistance (mins.)	
							E	EI
Concrete	150	2400 x 1200	Diameter up to 32 mm, wall thickness 1.8 – 3.0 mm	No restriction	100	1 & 2	120	120
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Services - PP pipes according to EN 1852-1: 2009	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Fire Resistance (mins.)	
							E	EI
Concrete	150	2400 x 1200	Diameter up to 32 mm, wall thickness 1.9 – 4.4 mm	No restriction	100	1 & 2	120	120

All pipe classifications are pipe end configuration U/C and C/C (U=Uncapped, C=Capped).
 Minimum separation between pipes of 30 mm (a^3) and from seal edges 30 mm (a^1 & a^2).
 Pipes to be supported at 220 and 450 mm from each face of the wall.



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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipes	Seal Position	Minimum Seal Depth (mm)	Insulation	Fire Resistance (mins.)	
							E	EI
Masonry/ Concrete	150	2400 wide x 1200 high	40 mm diameter/1.5-14.2 mm wall*	No restriction	100	20 mm Stone wool insulation 80 kg/m ³	240	240
			40 mm diameter/1.5-14.2 mm wall*					
			50 mm diameter/1.7-14.2 mm wall*					
			60 mm diameter/1.9-14.2 mm wall*					
			75 mm diameter/2.2-14.2 mm wall*					
			90 mm diameter/2.5-14.2 mm wall*			30 mm Stone wool insulation 80 kg/m ³	240	120
			100 mm diameter/2.7-14.2 mm wall*					
			115 mm diameter/3-14.2 mm wall*					
			140 mm diameter/3.5-14.2 mm wall*					
			165 mm diameter/ 3.9-14.2 mm wall*					
			180 mm diameter/ 4.2-14.2 mm wall*					
			200 mm diameter/ 4.6-14.2 mm wall*					
			219 mm diameter/ 5.0-14.2 mm wall*					

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

All pipe insulation shall be 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted)



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PROTECTA EX MORTAR: Service Penetration Seals in Walls								
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Fire Resistance (mins.)	
							E	EI
Masonry/ Concrete	150	2400 wide x 1200 high	Blank seals	Both sides	50	50 mm Stone wool 150 kg/m ³	240	240
			Electric cables up to 80 mm diameter, single or in a bundle.				240	60
			Steel cable trays and ladders up to 500 mm wide				60	60
			Telecoms cables up to 21 mm diameter, single or in a bundle up to 100 mm diameter				240	120
			Unsheathed wire up to 24 mm diameter					

Minimum separation between cables and the edge of the seal of 30 mm.

PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 wide x 1200 long	None (blank)	Flush with upper face of floor	50	50 mm Stone wool 150 kg/m ³	180	180
			Single* electrical cables up to 21 mm Ø				180	90
			Electrical cables up to 21 mm Ø (single, bundled and on trays)				180	60
			Electrical cables up to 80 mm Ø (single, bundled and on trays)				90	45
			Telecommunication cables up to 21 mm Ø (in tied bundles up to 100 mm Ø)				180	180
			Steel cable trays & ladders				90	60
			Non-sheathed wires up to 17 mm Ø				180	60
			Non-sheathed wires up to 24 mm Ø				180	30
			PVC conduits up to 16 mm Ø				180	180

* To be separated by at least 30 mm
 Minimum cable separation from seal edges 30 mm
 Conduit classification is end configuration C/U and C/C (U=Uncapped, C=Capped).



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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services – Copper or steel Pipes	Seal Position	Minimum Seal Depth (mm)	Backing Material	Insulation	Fire Resistance (mins.)	
								E	EI
Concrete	100	70 x 70	Up to 12 mm diameter/ 1-5 mm wall	Flush with upper face of floor	50	50 mm Stone wool 150 kg/m ³	20 mm Stone wool 80 kg/m ³	240	240
		115 x 115	Up to 54 mm diameter/ 1-14.2 mm wall					240	180
		2400 x 1200	Up to 54 mm diameter/ 1-14.2 mm wall					180	180
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services – Mild or Stainless Steel Pipes	Seal Position	Minimum Seal Depth (mm)	Backing Material	Insulation	Fire Resistance (mins.)	
Concrete	100	280 x 280	40 mm diameter/1-14.2 mm wall*	Flush with upper face of floor	50	50 mm Stone wool 150 kg/m ³	30 mm Stone wool 80 kg/m ³	240	240
			40 mm diameter/1-14.2 mm wall*					240	90
			50 mm diameter/1.2-14.2 mm wall*						
			60 mm diameter/1.4-14.2 mm wall*						
			75 mm diameter/1.7-14.2 mm wall*						
			90 mm diameter/2-14.2 mm wall*						
			100 mm diameter/2.2-14.2 mm wall*						
			115 mm diameter/2.5-14.2 mm wall*						
			140 mm diameter/3-14.2 mm wall*						
			165 mm diameter/3.5-14.2 mm wall*						
			180 mm diameter/3.8-14.2 mm wall*						
			200 mm diameter/4.2-14.2 mm wall*						
219 mm diameter/4.5-14.2 mm wall*									

* Typical pipe diameters shown, intermediate sizes are possible

All copper pipe classifications are pipe end configuration C/C, all steel pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

Minimum pipe separation from seal edges 30 mm.

All pipe insulation shall be 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted)



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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services – Mild or Stainless Steel Pipes	Seal Position	Minimum Seal Depth (mm)	Backing Material	Insulation	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	40 mm diameter/1-14.2 mm wall*	Flush with upper face of floor	50	50 mm Stone wool 150 kg/m ³	20 mm Stone wool 80 kg/m ³	180	180
			40 mm diameter/1-14.2 mm wall*				30 mm Stone wool 80 kg/m ³	180	90
			50 mm diameter/1.2-14.2 mm wall*						
			60 mm diameter/1.4-14.2 mm wall*						
			75 mm diameter/1.7-14.2 mm wall*						
			90 mm diameter/2-14.2 mm wall*						
			100 mm diameter/2.2-14.2 mm wall*						
			115 mm diameter/2.5-14.2 mm wall*						
			140 mm diameter/3-14.2 mm wall*						
			165 mm diameter/3.5-14.2 mm wall*						
			180 mm diameter/3.8-14.2 mm wall*						
			200 mm diameter/4.2-14.2 mm wall*						
219 mm diameter/4.5-14.2 mm wall*									

* Typical pipe diameters shown, intermediate sizes are possible
 All pipe classifications are pipe end configuration C//U (U=Uncapped, C=Capped).
 Minimum pipe separation from seal edges 30 mm.
 All pipe insulation shall be 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted)



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Substrate	Minimum Substrate Thickness (mm)	Max. Opening Size (mm)	Penetrating Services – Mild or Stainless Steel Pipes	Seal Position	Minimum Seal Depth (mm)	Backing Material	Insulation CS	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	40 mm diameter/1-14.2 mm wall	At any position within the depth of the floor	50	50 mm Stone wool 140 kg/m ³	20 mm Stone wool 80 kg/m ³ 30-80 mm thick stone, mineral wool min. 80 kg/m ³	180 240#	180 240#
			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*									
Substrate	Minimum Substrate Thickness (mm)	Max. Opening Size (mm)	Penetrating Services – PEX pipe in pipe systems	Seal Position	Minimum Seal Depth (mm)	Backing Material	Insulation CS	Fire Resistance (mins.)	
Concrete	100	2400 x 1200	15 mm diameter x 2.5 mm wall inner /25mm diameter outer	At any position within the depth of the floor	50	50 mm Stone wool 140 kg/m ³	None	180 240#	180 240#

* Typical pipe diameters shown, intermediate sizes are possible

#EI 240 in apertures up to a maximum of 550 x 1100 mm

All steel pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped). PEX pipes are pipe end configuration C/C
 Minimum pipe separation from seal edges 30 mm.
 CS = Continuous Sustained



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Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	None (blank)	Flush with upper face of floor	100	None	240	240
			Electrical cables up to 50 mm Ø (single, bundled and on trays)				180	60
			Electrical cables up to 80 mm Ø (single, bundled and on trays)				120	60
			Cables up to 21 mm Ø (in tied bundles up to 100 mm Ø)				180	120
			Steel cable trays & ladders				120	60
			Non-sheathed cables up to 17 mm Ø				180	90
			Non-sheathed cables up to 24 mm Ø				180	20
			PVC conduits up to 16 mm Ø				180	180

Minimum cable separation from seal edges 30 mm.
 Conduit classification is end configuration C/U and C/C (U=Uncapped, C=Capped).



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Substrate	Minimum Substrate Thickness (mm)	Services – Copper Pipes	Min. Seal Depth (mm)	Max. Seal Size (mm)	Wrap	Insulation	Fire Resistance (mins.)				
							E	EI			
Concrete	100	12 mm diameter/1 mm wall	100	1200 x 2400	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	240	240			
		12-54 mm diameter/1-1.2 mm wall				13-25 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	240	60			
Substrate	Minimum Substrate Thickness (mm)	Services – Alupex Pipes	Min. Seal Depth (mm)	Max. Seal Size (mm)	Wrap	Insulation	Fire Resistance (mins.)				
							E	EI			
Concrete	100	16 mm diameter/2.25 mm wall	100	1200 x 2400	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	240	240			
		16 mm diameter/2.25 mm wall				9-13 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	240	90			
		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 minimum class B-s3,d0 or foil faced Phenolic Foam insulation	180	90
		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											

All pipe classifications are pipe end configuration C/C (C=Capped).
 Minimum pipe separation is 30 mm from other services and 25 mm from seal edges.
 All pipe insulation shall be CS (Continuous Sustained).



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PROTECTA EX MORTAR: Service Penetration Seals in Floors							
Substrate	Minimum Substrate Thickness (mm)	Min. Seal Depth (mm)	Services	Max. Seal Size (mm)	Insulation	Fire Resistance (mins.)	
						E	EI
Concrete	100	100	Up to 16 mm diameter steel pipe 1.5-7 mm wall***	2400 x 1200	None	240	120
	150	150	Up to 63.5 mm diameter steel pipes 1.6-14.2 mm wall			180	90
	120	120	Up to 12 mm diameter Copper and steel pipes 0.7-1.5 mm wall***			240	180
	100	100	Up to 54 mm diameter Copper pipe 1.5-14.2 mm wall***			120	20
			75 mm Alupex composite pipe with 4.6 mm wall**			240	20
Substrate	Minimum Substrate Thickness (mm)	Min. Seal Depth (mm)	Services- Mild or Stainless Steel Pipes	Max. Seal Size (mm)	Insulation	Fire Resistance (mins.)	
						E	EI
Concrete	100	100	40 mm diameter/1.5-14.2 mm wall*	2400 x 1200	20 mm Stone wool 80 kg/m ³	240	240
			40 mm diameter/1.5-14.2 mm wall*		30 mm Stone wool 80 kg/m ³	240	120
			50 mm diameter/1.7-14.2 mm wall*				
			60 mm diameter/1.8-14.2 mm wall*				
			75 mm diameter/2.1-14.2 mm wall*				
			90 mm diameter/2.3-14.2 mm wall*				
			100 mm diameter/2.5-14.2 mm wall*				
			115 mm diameter/2.8-14.2 mm wall*				
			140 mm diameter/3.2-14.2 mm wall*				
			165 mm diameter/ 3.6-14.2 mm wall*				
			180 mm diameter/ 3.9-14.2 mm wall*				
			200 mm diameter/ 4.2-14.2 mm wall*				
219 mm diameter/ 4.5-14.2 mm wall*							

* Typical pipe diameters shown, intermediate sizes are possible.

All pipe classifications are pipe end configurations C/U (U=Uncapped, C=Capped) except those marked ** which are U/C, and those marked *** which are C/C

Minimum pipe separation is 30 mm from seal edges.

All pipe insulation shall be 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted).

Seals shall be flush with the top surface of the floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Services – Mild or Stainless Steel Pipe	Min. Seal Depth (mm)	Max. Seal Size (mm)	Wrap	Insulation	Fire Resistance (mins.)	
							E	EI
Concrete	100	40 mm diameter/1.5-14.2 mm wall	100	2400 x 1200	1 off 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	180	180
		40 mm diameter/1.5-14.2 mm wall*				13-19 mm Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	180	120
		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, intermediate sizes are possible.

All pipe classifications are pipe end configuration C/U (U= Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and 30 mm from seal edges.
 All pipe insulation shall be CS (Continuous Sustained).
 Seals shall be flush with the top surface of the floor.



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Substrate	Minimum Substrate Thickness (mm)	Max. Opening Size (mm)	Penetrating Services – Mild or Stainless Steel Pipes	Seal Position	Minimum Seal Depth (mm)	Protecta FR Wrap	Insulation CS	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	40 mm diameter/1-14.2 mm wall	At any position within the depth of the floor	100	50 x 3.6 mm (2 x 1.8 layer) at the soffit	25 mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	240	240
			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*									
Concrete	150	2400 x 1200	40 mm diameter/1-14.2 mm wall*	At any position within the depth of the floor	100	50 x 5.4 mm (3 x 1.8 layer) at the soffit	25-50 mm thick Elastomeric insulation minimum class B-s3,d0 or foil faced Phenolic Foam insulation	120	120
			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*									

* Typical pipe diameters shown, intermediate sizes are possible
 All steel pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and 30 mm from seal edges.
 CS = Continuous Sustained



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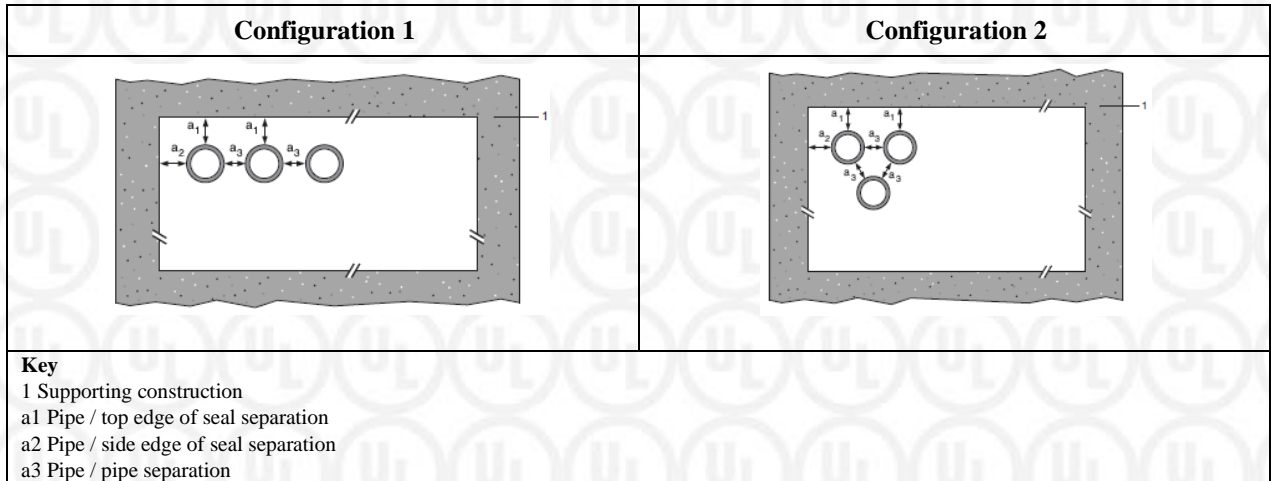
PROTECTA EX MORTAR: Service Penetration Seals in Floors							
Substrate	Minimum Substrate Thickness (mm)	Services - PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1	Min. Seal Depth (mm)	Max. Seal Size (mm)	Wrap	Fire Resistance (mins.)	
						E	EI
Concrete	100	Up to 40 mm diameter / 1.8-3.7 mm wall ~	100	2400 x 1200	50 x 1.8 mm	180	120
		Up to 110 mm diameter / 3.0-6.6 mm wall			50 x 3.6 mm	240	240
		Up to 125 mm diameter / 3.5-7.4 mm wall			50 x 7.2 mm	120	120
		Up to 160 mm diameter / 4.5 mm wall **			50 x 10.8 mm	240	240
		Up to 160 mm diameter / 4.5-9.5 mm wall **			50 x 10.8 mm	90	90
		Up to 110 mm diameter/ 2.7-6.6 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø telecom cables			50 x 3.6 mm	120	120
Substrate	Minimum Substrate Thickness (mm)	Services - PP pipes according to EN 1451-1	Min. Seal Depth (mm)	Max. Seal Size	Wrap	Fire Resistance (mins.)	
						E	EI
Concrete	100	Up to 40 mm diameter /1.8-4.4 mm wall	100	2400 x 1200	None	120	120
		Up to 40 mm diameter /1.8-5.5 mm wall ~			50 x 1.8 mm	120	120
		Up to 50 mm diameter /2.5-5.5 mm wall **			50 x 3.6 mm	240	240
		Up to 75 mm diameter /3.5-5.5 mm wall **			50 x 3.6 mm	240	240
		Up to 110 mm diameter /2.7-6.3 mm wall			50 x 3.6 mm	240	240
		Up to 125 mm diameter /3.4-11.4 mm wall			50 x 7.2 mm	240	240
		Up to 160 mm diameter /4.9-14.6 mm wall			50 x 10.8 mm	240	240
		Up to 110 mm diameter/ 3.4-6.3 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø telecom cables			50 x 3.6 mm	60	60
Substrate	Minimum Substrate Thickness (mm)	Services - PE pipes according to EN 1519-1, EN 12201-2 and EN 12666-1	Min. Seal Depth (mm)	Max. Seal Size	Wrap	Fire Resistance (mins.)	
						E	EI
Concrete	100	Up to 40 mm diameter / 2.0-4.4 mm wall	100	2400 x 1200 mm	None	120	120
		Up to 40 mm diameter / 2.4-3.7 mm wall ~			50 x 1.8 mm	240	240
		Up to 110 mm diameter / 3.4-10.0 mm wall			50 x 3.6 mm	120	120
		Up to 125 mm diameter / 3.9-11.4 mm wall			50 x 7.2 mm	240	240
		Up to 160 mm diameter / 4.9-14.6 mm wall			50 x 10.8 mm	120	120
		Up to 250 mm diameter / 7.8 mm wall **			75 x 12.6 mm	180	180
		Up to 110 mm diameter/ 2.7-10.0 mm wall, containing up to 90mm Ø bundle of up to 14 mm Ø telecom cables			50 x 3.6 mm	120	60

All pipe classifications are pipe end configurations U/C, with the exception of those marked ‘**’ which are C/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and from seal edges.
 Seals may be at any position within the floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	160 mm diameter / 9.5 mm wall	100	1 & 2	50 x 1.8 mm	90	90
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PEX pipe in pipe systems according to ISO 15875	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	Maximum 54 mm diameter/0.4 mm wall thickness (outer pipe), 28 mm diameter/4.0 mm wall thickness (inner pipe)	100	1 & 2	50 x 3.6 mm	120**	120
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Rehau Raupiano Plus PP-DD according to DIN 4102	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	40-50 mm diameter/1.8-2.7 mm wall thickness*	100	1 & 2	50 x 3.6 mm	120~	120
			75-110 mm diameter/2.7 mm wall thickness*			50 x 3.6 mm	120	120
			125 mm diameter/3.1 mm wall thickness			50 x 7.2 mm	240	120
			160 mm diameter/3.9 mm wall thickness			50 x 10.8 mm	120	120
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Polo-Kal NG Poloplast PP-MV according to DIN 4102	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	32-110 mm diameter/3.4 mm wall thickness	100	1 & 2	50 x 3.6 mm	180	180
			125 mm diameter/3.9 mm wall thickness			50 x 7.2 mm	240	240
			160 mm diameter/4.3 mm wall thickness			50 x 10.8 mm	240	240
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Aquatherm Green SDR9 MF PP-RP according to ISO 21003	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	2400 x 1200	32 mm diameter/3.6 mm wall thickness	100	1 & 2	50 x 1.8 mm	240**	240
			40-50 mm diameter/5.6-12.3 mm wall thickness*			50 x 3.6 mm	240**	240
			63-110 mm diameter/12.3 mm wall thickness*			50 x 3.6 mm	240**	240

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations U/C, with the exception of those marked ‘**’ which are C/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).

Minimum pipe separation is 30 mm from other services and from seal edges.

Seals may be at any position within the floor.



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Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Wavin SiTech + PP-M B according to EN 13501-1	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	32-50 mm diameter/1.8-3.4 mm wall thickness*	At any position within the depth of the floor	100	1 & 2	50 x 3.6 mm	120~	120
			75-110 mm diameter/3.4 mm wall thickness*				50 x 3.6 mm	120	120
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Gilbert Silent PP according to DIN 4102	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	32-50 mm diameter/1.8-3.4 mm wall thickness*	At any position within the depth of the floor	100	1 & 2	50 x 3.6 mm	120~	120
			75-110 mm diameter/3.4 mm wall thickness*				50 x 3.6 mm	120	120
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - BluePower Multilayer pipes according to EN 1451-1	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	32-50 mm diameter/1.8-3.4 mm wall thickness*	At any position within the depth of the floor	100	1 & 2	50 x 3.6 mm	240~	240
			75 mm diameter/2.5-3.4 mm wall thickness to 110mm diameter/3.4 mm wall thickness*				50 x 3.6 mm	120	120
			125 mm diameter/3.9 mm wall thickness*				50 x 7.2 mm	240	120
			160 mm diameter/4.9 mm wall thickness*				50 x 10.8 mm	240	240
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - Uponor Decibel pipes according to EN 14366	Seal Position	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
								E	EI
Concrete	100	2400 x 1200	32-50 mm diameter/2.0-3.8 mm wall thickness*	At any position within the depth of the floor	100	1 & 2	50 x 3.6 mm	120~	120
			75 mm diameter/2.8-3.8 mm wall thickness to 110mm diameter/3.8 mm wall thickness*				50 x 3.6 mm	120	120

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations U/C, with the exception of those marked ‘**’ which are C/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).

Minimum pipe separation is 30 mm from other services and from seal edges.

Seals may be at any position within the floor.



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Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PVC-U pipes according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	150	2400 x 1200	Diameter 41 mm, wall thickness 1.8-3.7 mm to diameter 125 mm, wall thickness 4.8-7.4 mm*	150	1 & 2	50 x 7.2 mm	60~	60
			125 mm diameter / 7.4 mm wall			50 x 7.2 mm	120~	120
			Diameter 126 mm, wall thickness 4.8-7.4 mm to diameter 160 mm, wall thickness 9.5 mm*		1	75 x 10.8 mm	120~	30
			160 mm diameter / 9.5 mm wall			75 x 7.2 mm	120~	30
	160 mm diameter / 4.5-9.5 mm wall thickness		1 & 2	50 x 10.8 mm	120**	120		
	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	120	120		
	200 mm diameter / 4.9-11.9 mm wall thickness			75 x 10.8 mm	240	240		
	Diameter 201 mm, wall thickness 4.9-11.9 mm to diameter 315 mm, wall thickness 7.7 mm*			75 x 18 mm	120	120		
	315 mm diameter / 7.7 mm wall thickness	1	75 x 18 mm	120	120			
	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	90	90			
	315 mm diameter / 12.1 mm wall thickness		75 x 18 mm	90	90			
	Diameter 315 mm, wall thickness 7.7-12.1 mm to diameter 400 mm, wall thickness 15.3 mm*		75 x 28.8 mm	60	60			
	400mm diameter / 15.3 mm wall thickness	1 & 2	75 x 28.8 mm	60	60			

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations C/C, with the exception of those marked ‘**’ which are U/C and also C/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).

Minimum pipe separation is 30 mm from other services and from seal edges.

Seals may be at any position within the floor.



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Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PP pipes according to EN 1451-1	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)		
							E	EI	
Concrete	150	2400 x 1200	Diameter 41 mm, wall thickness 1.8-5.5 mm to diameter 160 mm, wall thickness 4.9-14.6 mm*	150	1 & 2	75 x 10.8 mm	120**	120	
			160 mm diameter / 14.6 mm wall			75 x 7.2 mm	240~	240	
	120		Diameter 161 mm, wall thickness 4.9-14.6 mm to diameter 200 mm, wall thickness 4.9-18.2 mm*	120	N/A	75 x 10.8 mm	240	240	
	150		Diameter 201 mm, wall thickness 4.9-18.2 mm to diameter 315 mm, wall thickness 7.7 mm*	150	N/A	75 x 18 mm	180	180	
			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	60	60	
			315 mm diameter / 7.7 mm wall			75 x 18 mm	180	180	
			315 mm diameter / 7.7-28.6 mm wall			75 x 18 mm	60	60	
			Diameter 315 mm, wall thickness 7.7-28.6 mm to diameter 400 mm, wall thickness 22.7 mm*			1	75 x 28.8 mm	60	60
			400mm diameter / 22.7 mm wall thickness			1 & 2	75 x 28.8 mm	60	60
	Substrate		Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	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	Minimum Seal Depth (mm)	Permitted configuration for seal separation	Wrap	Fire Resistance (mins.)
Concrete	150	2400 x 1200	Diameter 126 mm, wall thickness 3.9-11.4 mm to diameter 160 mm, wall thickness 14.6 mm*	150	N/A	75 x 18 mm	240~	120	
			160 mm diameter / 14.6 mm wall			75 x 7.2 mm	240~	120	
			Diameter 161 mm, wall thickness 4.9 - 14.6 mm to diameter 200 mm, wall thickness 6.2-18.2 mm*			1 & 2	75 x 10.8 mm	120	120
	120		200 mm diameter / 6.2-18.2 mm wall thickness	120	N/A	75 x 10.8 mm	240	240	
	150		Diameter 161 mm, wall thickness 4.9-14.6 mm to diameter 315 mm, wall thickness 9.7-18.7 mm*	150	N/A	75 x 18 mm	60	60	

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations C/C, with the exception of those marked ‘**’ which are U/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).

Minimum pipe separation is 30 mm from other services and from seal edges.

Seals may be at any position within the floor.



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Substrate	Minimum Substrate Thickness (mm)	Services – Alupex Pipes	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Insulation	Fire Resistance (mins.)	
							E	EI
Concrete	100	16 mm diameter/2.25 mm wall	50	135 x 135	50 mm Stone wool 150 kg/m ³	500 mm long, minimum 20 mm Stone wool minimum 80 kg/m ³	240	240
		16 mm diameter/2.25 mm wall					240	180
		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		180			180	
		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								

All pipe classifications are pipe end configuration C/C (C=Capped).
 Minimum pipe separation is 10 mm from seal edges.
 All pipe insulation shall be CI (Continuous Interrupted) or LI (Local Interrupted).
 Seals may be at any position to either side of the floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Services – Copper or steel pipes	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Insulation	Fire Resistance (mins.)	
							E	EI
Concrete	100	12 -54 mm diameter/0.7-14.2 mm wall*	50	2400 x 1200	50 mm Stone wool 150 kg/m ³	Minimum 20-80 mm Stone wool insulation minimum 80 kg/m ³	180	120
		6 mm diameter/0.7-3 mm wall*					180	120
		7-15 mm diameter/0.7-7.5 mm wall*				180	30	
		16-54mm diameter/1.2-14.2mm wall*				180	180	
Concrete	100	4-16 mm diameter/1.0-8.0 mm wall*	50	2400 x 1200	50 mm Stone wool 150 kg/m ³	None	180**	180
		17-324 mm diameter/6.35-14.2 mm wall*					180**	20
Concrete	100	16-20 mm diameter/2.0 mm wall	50	2400 x 1200	50 mm Stone wool 150 kg/m ³	None	180	180
		75mm diameter/4.6mm wall					180	30
		16 mm diameter/2.25 mm wall				Minimum 20 mm glass- or stone wool insulation minimum 75 kg/m ³	180	180
		16-75 mm diameter/2.25-4.6 wall*					Minimum 25-50 mm glass- or stone wool insulation minimum 75 kg/m ³	120

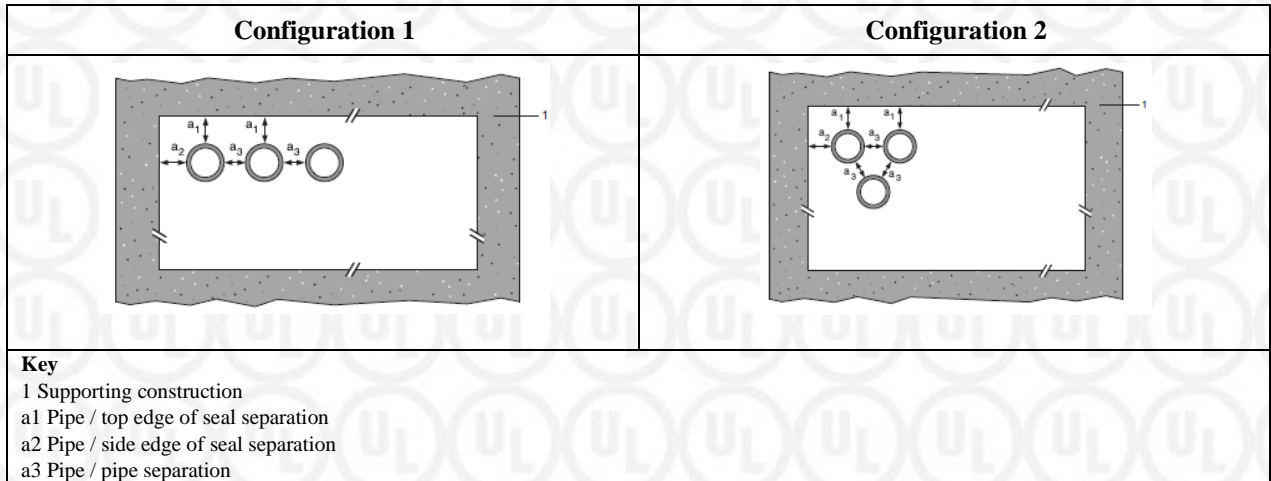
* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configuration C/C (C=Capped), with the exception of those marked ‘**’ which are C/U.
 Minimum pipe separation is 30 mm from seal edges.
 All pipe insulation shall be CS (Continuous Sustained).
 Seals may be at any position to either side of the floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Services	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Wrap	Fire Resistance (mins.)	
							E	EI
Concrete	100	40 mm diameter /3 mm wall PP pipe according to EN 1451-1	50	2400 x 1200	50 mm Stone wool 150 kg/m ³	None	120	120
		40 mm diameter /4 mm wall 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						
		110 mm diameter /4.3 mm wall 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				50 x 1.8 mm	60	60

All pipe classifications are pipe end configuration C/C (C=Capped).
 Minimum pipe separation is 30 mm from other services, 30 mm from seal edges.
 Seals shall be flush with the top surface of the floor.



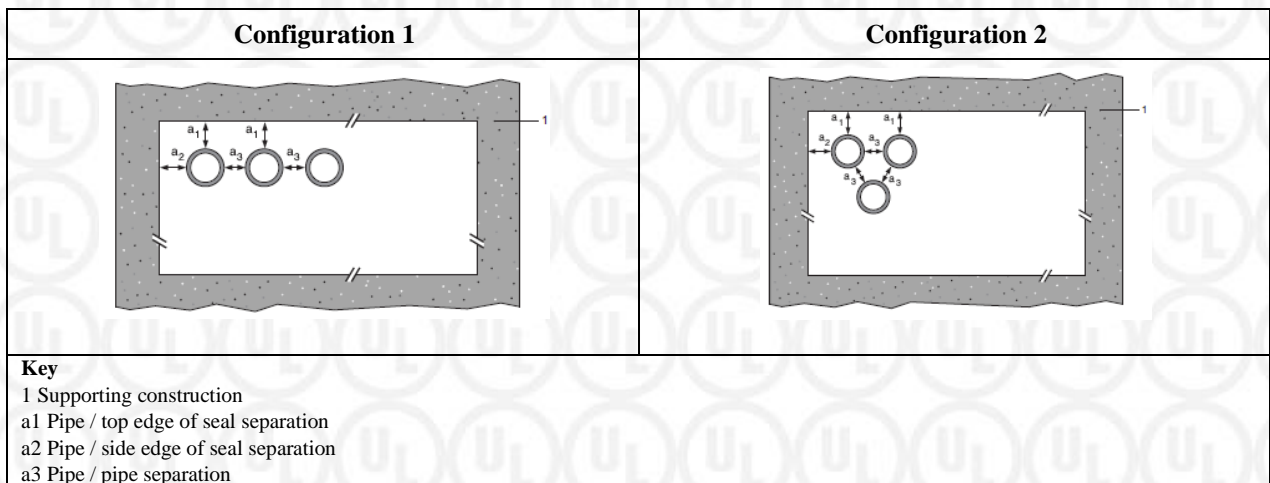
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PROTECTA EX MORTAR: Service Penetration Seals in Floors								
Substrate	Minimum Substrate Thickness (mm)	Services - PVC-U pipe according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Permitted configuration for seal separation	Fire Resistance (mins.)	
							E	EI
Concrete	100	Diameter 16 mm, wall thickness 1.6 – 3.4 mm, to diameter 40 mm, wall thickness 1.9-3.0 mm*	50	2400 x 1200	50 mm Stone wool 150 kg/m ³	1 & 2 between all specified pipes	120	120

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations U/C (U=Uncapped, C=Capped).
 Minimum separation between pipes of 30 mm (a3) and from seal edges 30 mm (a1 & a2).
 Seals may be flush with either surface of the floor.
 Pipe support required 450 mm above floor.



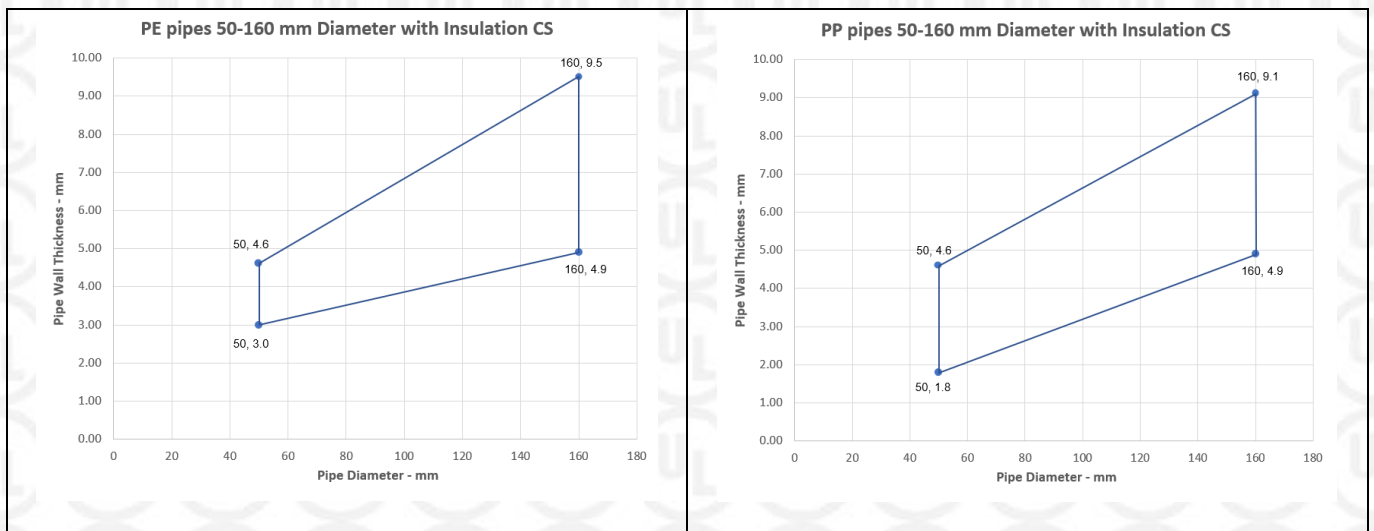
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PROTECTA EX MORTAR: Service Penetration Seals in Floors									
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PE pipes according to EN 1519-1, EN 12201-2 and EN 12006-1, ABS according to EN 1455-1 and pipes made from SAN+PVC according to EN 1565-1	Outer diameter including insulation	Minimum Seal Depth (mm)	Wrap	Insulation CS	Fire Resistance (mins.)	
								E	EI
Concrete	120	2400 x 1200	Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	120	50 x 3.6 mm	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	240	240
				Maximum 178 mm diameter					
				Maximum 260 mm diameter					
Concrete	120	2400 x 1200	Maximum 160 mm diameter pipe*	Maximum 68 mm diameter	120	50 x 3.6 mm	9-50 mm Elastomeric insulation minimum class B-s3,d0 or foil faced phenolic foam insulation	240	180
				Maximum 178 mm diameter					
				Maximum 260 mm diameter					

* See below graphs for intermediate pipe sizes

All pipe classifications are pipe end configurations C/C (U=Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and from seal edges.
 Seals may be at any position within the floor.
 CS = Continuous Sustained



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PROTECTA EX MORTAR: Service Penetration Seals in Floors									
Substrate	Minimum Substrate Thickness (mm)	Max. Opening Size (mm)	Services - Mild or Stainless Steel Pipes	Seal Position	Minimum Seal Depth (mm)	Protecta FR Wrap	Insulation CS	Fire Resistance (mins.)	
								E	EI
Concrete	150	2400 x 1200	12 mm diameter/ 1.0 mm wall	At any position within the depth of the floor	150	50 x 1.8 mm (1 x 1.8 layer) at the soffit	9 mm thick PE foam insulation	180	180
			Maximum 76 mm diameter/ 1.5 - 14.2 mm wall*			50 x 3.6 mm (2 x 1.8 layer) at the soffit			

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and 30 mm from seal edges.
 CS = Continuous Sustained

PROTECTA EX MORTAR: Service Penetration Seals in Floors									
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PVC-U pipes according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1	Minimum Seal Depth (mm)	Protecta FR Wrap	Permitted configuration for seal separation	Fire Resistance (mins.)		
							E	EI	
Concrete	150	2400 x 1200	Up to 40 mm diameter/1.8-3.7 mm wall*	150	50 x 1.8 mm	1 & 2	120	120	
			Up to 125 mm diameter / 4.8-7.4 mm wall*		50 x 7.2 mm		60	60	
			Up to 160 mm diameter/9.5 mm wall*		75 x 7.2 mm		120	30	
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - PP pipes according to EN 1451-1	Minimum Seal Depth (mm)	Protecta FR Wrap	Permitted configuration for seal separation	Fire Resistance (mins.)		
Concrete	150	2400 x 1200	Up to 40 mm diameter/1.8-5.5 mm wall*	150	50 x 1.8 mm	1 & 2	120	120	
			Up to 125 mm diameter / 11.4 mm wall*		50 x 7.2 mm		240	240	
			Up to 160 mm diameter/14.6 mm wall*		75 x 7.2 mm		240	240	
Substrate	Minimum Substrate Thickness (mm)	Max. Seal Size (mm)	Services - 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	Minimum Seal Depth (mm)	Protecta FR Wrap	Permitted configuration for seal separation	Fire Resistance (mins.)		
Concrete	150	2400 x 1200	Up to 40 mm diameter/2.4-3.7 mm wall*	150	50 x 1.8 mm	1 & 2	240	240	
			Up to 110 mm diameter/3.4-10 mm wall*		75 x 5.4 mm		240	240	
			Up to 125 mm diameter/11.4 mm wall*		50 x 7.2 mm		240	240	
			Up to 160 mm diameter/4.9-14.6 mm wall*		75 x 7.2 mm		120	120	

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations U/U (U=Uncapped, C=Capped).
 Minimum pipe separation is 30 mm from other services and from seal edges.
 Seals may be at any position within the floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Floors

Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Fire Resistance (mins.)	
							E	EI
Concrete	150	2400 x 1200	Blank seals	Either face of floor	150	None	240	240
			Electric cables up to 21 mm diameter, single or in a bundle.				240	120
			Steel cable trays and ladders up to 500 mm wide				240	90
			Electric cables 22-50 mm diameter, single or in a bundle.				90	60
			Electric cables 51-80 mm diameter, single or in a bundle.				120	120
			Unsheathed wire up to 24 mm diameter					

Minimum separation between cables and the edge of the seal of 30 mm.
 Support to cable trays at 450 mm above floor.



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PROTECTA EX MORTAR: Service Penetration Seals in Walls									
Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services	Seal Position	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Fire Resistance (mins.)	
								E	EI
Drywall/ Masonry/ Concrete	100	2400 wide x 1200 high	None	Both sides of the wall	25	Stone wool 150 kg/m ³	50	120	120
			Single electrical cables up to 21 mm Ø (min.100 separation from other services)					120	90
			Electrical cables up to 80 mm Ø (single, bundle and on trays)					120	60
			Steel cable trays & ladders						
			Steel conduits up to 16 mm Ø					120	45
			Copper conduits up to 16 mm Ø						
			Non-sheathed wires up to 24 mm Ø						
			PVC conduits up to 16 mm Ø					120	120

Penetration Seal: Cables fitted at any position within the aperture (min. separation 25 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.

All conduit classifications are end configuration C/U, except PVC which is also C/C (U=Uncapped, C=Capped).



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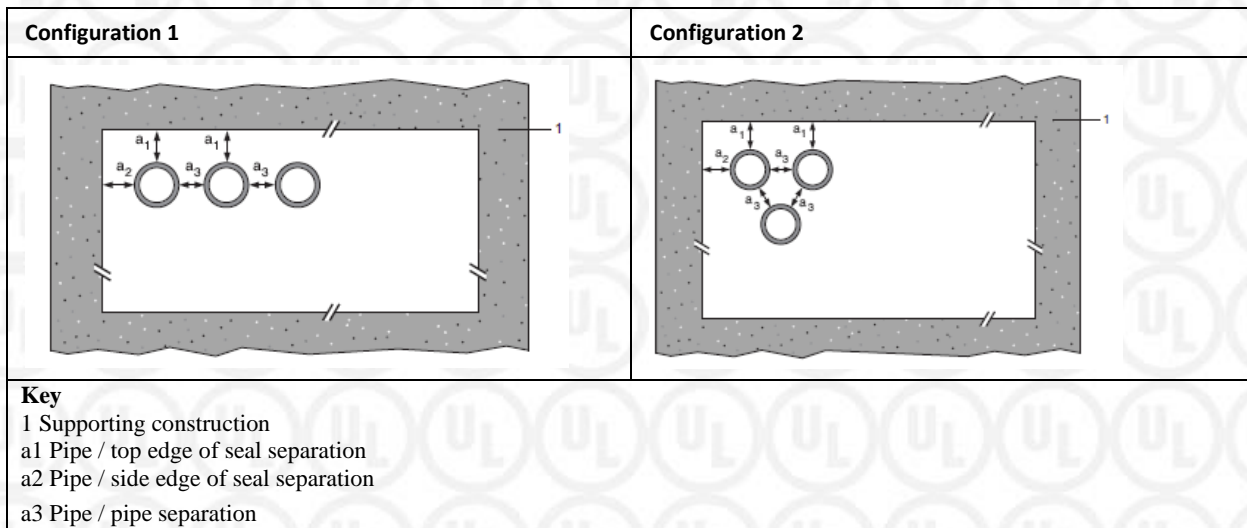
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Protecta EX Mortar: Service Penetration Seals comprising 25 mm deep Protecta EX Mortar to both faces backed with 50 mm mineral fibre board, installed within flexible or rigid wall							
Substrate	Minimum Substrate Thickness (mm)	Penetrating Services - Mild or stainless steel pipe	Wrap	Wrap Position	Insulation CS	Fire Resistance (mins.)	
						E	EI
Gypsum board, Masonry/Concrete	100	40 mm diameter/1-14.2 mm wall	2 off 50 x 1.8 mm	One fitted flush to each face of seal	13 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	120	120
		40 mm diameter/1-14.2 mm wall*	2 off 50 x 3.6 mm			120	60
		50 mm diameter/1.3-14.2 mm wall*				120	60
		60 mm diameter/1.6-14.2 mm wall*				120	60
		75 mm diameter/2-14.2 mm wall*				120	60
		90 mm diameter/2.4-14.2 mm wall*				120	60
		100 mm diameter/2.7-14.2 mm wall*				120	60
		115 mm diameter/3.1-14.2 mm wall*				120	60
		140 mm diameter/3.8-14.2 mm wall*				120	60
165 mm diameter/ 4.5-14.2 mm wall*	120	60					

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

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.



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PROTECTA EX MORTAR: Service Penetration Seals in Walls								
Substrate	Minimum Substrate Thickness (mm)	Penetrating Services	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Insulation	Fire Resistance (mins.)	
							E	EI
Drywall/ Masonry/ Concrete	100	Up to 54 mm diameter copper or steel pipes 1-14.2 mm wall**	25	2400 x 1200	50 mm Stone wool 150 kg/m ³	500 mm long, minimum 20 mm Stone wool minimum 80 kg/m ³	120	120
		75 mm diameter Alupex composite pipe with 7.5 mm wall~				600 mm long, minimum 25 mm Protecta Mineral Fibre BIO#	60	60
Substrate	Minimum Substrate Thickness (mm)	Services – Mild or Stainless Steel Pipe	Min. Seal Depth (mm)	Max. Seal Size (mm)	Backing	Insulation	Fire Resistance (mins.)	
							E	EI
Drywall/ Masonry/ Concrete	100	40 mm diameter /1-14.2 mm wall	25	2400 x 1200	50 mm Stone wool 150 kg/m ³	500 mm long, minimum 20 mm Stone wool minimum 80 kg/m ³	120	120
		40 mm diameter /1-14.2 mm wall*				500 mm long, minimum 30 mm Stone wool minimum 80 kg/m ³	120	90
		50 mm diameter /1.2-14.2 mm wall*						
		60 mm diameter /1.4-14.2 mm wall*						
		75 mm diameter /1.7-14.2 mm wall*						
		90 mm diameter /2-14.2 mm wall*						
		100 mm diameter /2.2-14.2 mm wall*						
		115 mm diameter /2.5-14.2 mm wall*						
		140 mm diameter /3-14.2 mm wall*						
		165 mm diameter /3.5-14.2 mm wall*						
		180 mm diameter /3.8-14.2 mm wall*						
		200 mm diameter /4.2-14.2 mm wall*						
219 mm diameter /4.5-14.2 mm wall*								

Penetration Seal: 500 mm (min.)* LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic (and composite) pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and from other services), 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. Maximum seal size 2400 mm wide x 1200 mm high

* Typical pipe diameters shown, intermediate sizes are possible

All pipe classifications are pipe end configurations C/U, with the exception of those marked ‘**’ which are C/C, and those marked ‘~’ which are U/U, C/U, U/C and C/C (U=Uncapped, C=Capped).

‘#’ Minimum 600 mm long insulation required for Alupex pipe



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Protecta EX Mortar: Service Penetration Seals comprising 25 mm deep Protecta EX Mortar to both faces backed with 50 mm mineral fibre board, installed within flexible or rigid wall							
Substrate	Minimum Substrate Thickness (mm)	Penetrating Services - Alupex Pipes	Wrap	Wrap Position	Insulation	Fire Resistance (mins.)	
						E	EI
Gypsum board, Masonry/Concrete	100	16 mm diameter/2.25 mm wall	2 off 50 x 3.6 mm	One fitted flush to each face of seal	Minimum 20 mm stone wool, minimum 80 kg/m ³	120	120
		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							

Penetration Seal: 500 mm (min.)* LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic (and composite) pipes fitted at any position within the aperture (min. separation 30 mm from seal edges and from other services), 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 150 kg/m³. Maximum seal size 2400 mm wide x 1200 mm high

All pipe classifications are pipe end configuration C/C (C=Capped).



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Protecta EX Mortar: Service Penetration Seals comprising 25 mm deep Protecta EX Mortar to both faces backed with 50 mm mineral fibre board, installed within flexible or rigid wall							
Substrate	Minimum Substrate Thickness (mm)	Penetrating Services - Copper pipes	Wrap	Wrap Position	Insulation	Fire Resistance (mins.)	
						E	EI
Gypsum board, Masonry/Concrete	100	12-54 mm diameter/1-1.2 mm wall	2 off 50 x 3.6 mm	Fitted to each face of seal	9-25 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	120	120
Substrate	Minimum Substrate Thickness (mm)	Penetrating Services - Alupex Pipes	Wrap	Wrap Position	Insulation	Fire Resistance (mins.)	
						E	EI
Gypsum board, Masonry/Concrete	100	16 mm diameter/2.25 mm wall	2 off 50 x 3.6 mm	Fitted to each face of seal	9-25 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	120	120
		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							

Penetration Seal: CS (Continuous Sustained) insulated metallic and composite pipes fitted at any position within the aperture (min. separation 25 mm from seal edges), with min. 25 mm Protecta EX Mortar to both sides of the wall, backed with min. 25 mm stone wool min. 150 kg/m³*. Protecta FR Pipe wraps are required to be fitted to both faces of the seal. Maximum seal size 2400 mm wide x 1200 mm long.

All pipe classifications are pipe end configuration C/C (C=Capped).



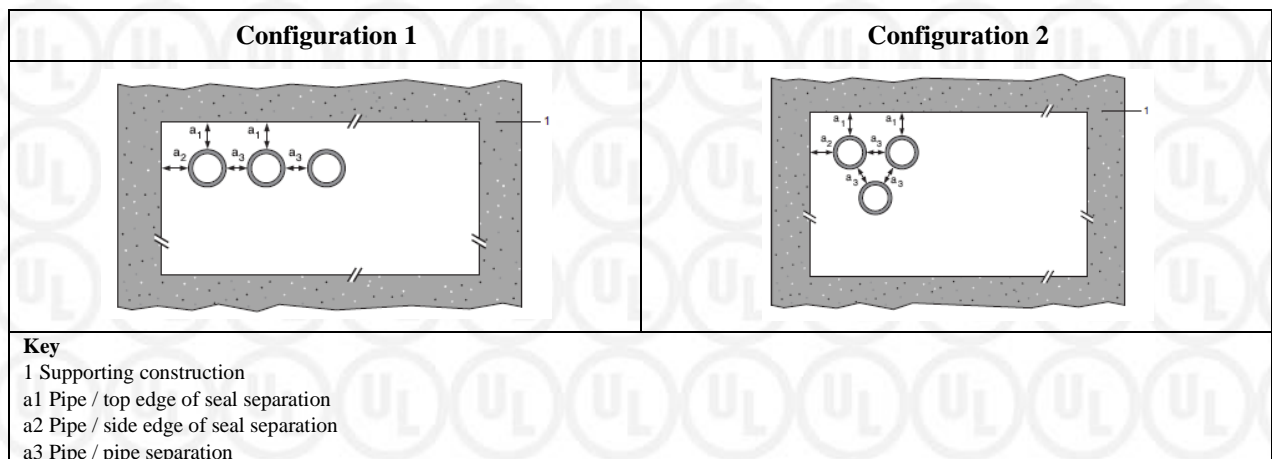
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PROTECTA EX MORTAR: Service Penetration Seals Comprising 25 mm deep Protecta EX Mortar to both faces backed with 50 mm stone wool board 140 kg/m ³								
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - PVC-U pipe according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Seal Position	Min. Seal Depth (mm)	Backing	Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
							E	EI
Gypsum board, Masonry/Concrete	100	Diameter up to 32 mm, wall thickness 1.6 – 2.4 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	1 & 2 between specified pipes	120	120
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - 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	Seal Position	Min. Seal Depth (mm)	Backing	Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
							E	EI
Gypsum board, Masonry/Concrete	100	Diameter up to 32 mm, wall thickness 1.8 – 3.0 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	1 & 2 between specified pipes	E	EI
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - PP pipe according to EN 1852-1: 2009	Seal Position	Min. Seal Depth (mm)	Backing	Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
							E	EI
Gypsum board, Masonry/Concrete	100	Diameter up to 32 mm, wall thickness 1.9 – 4.4 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	1 & 2 between specified pipes	120	120

Penetration Seal: Combustible pipes sealed with Protecta EX Mortar, to both sides of the wall, backed with stone wool board min. 140 kg/m³. Minimum separation between pipes of 30 mm (a₃) and from seal edges 30 mm (a₁ & a₂). Maximum seal size 2400 mm wide x 1200 mm high.

All pipe configurations are uncapped /capped (U/C) (U=Uncapped, C=Capped).



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PROTECTA EX MORTAR: Service Penetration Seals Comprising 25 mm deep Protecta EX Mortar to both faces backed with 50 mm stone wool board 140 kg/m ³									
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - PVC-U pipe according to EN 1329-1, EN 1452-2 and EN 1453-1, PVC-C according to EN 1566-1	Seal Position	Min. Seal Depth (mm)	Backing	Wrap	Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
								E	EI
Gypsum board, Masonry/Concrete	100	Diameter up to 40 mm, wall thickness 3.0-4.3 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	50 x 1.8 mm	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+ PVC and PP pipes in any combination	120	60
		Diameter up to 110 mm, wall thickness 2.7-6.6 mm				50 x 3.6 mm		120	90
		Diameter up to 125 mm, wall thickness 3.7- 7.4 mm				50 x 5.4 mm		120	120
		Diameter up to 160 mm, wall thickness 3.2-9.5 mm				50 x 7.2 mm		60	60
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - 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	Seal Position	Min. Seal Depth (mm)	Backing	Protecta FR Wrap	Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
Gypsum board, Masonry/Concrete	100	Diameter up to 40 mm, wall thickness 3.2-3.7 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	50 x 1.8 mm	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+ PVC and PP pipes in any combination	120	120
		Diameter up to 110 mm, wall thickness 4.2-10 mm				50 x 3.6 mm		60	60
		Diameter up to 125 mm, wall thickness 12 mm				50 x 5.4 mm		120	120
		Diameter up to 160 mm, wall thickness 4.9-12.0 mm				50 x 7.2 mm		90	90
		Diameter up to 160 mm, wall thickness 12.0 mm							
Substrate	Minimum Wall Thickness (mm)	Penetrating Services - PP pipe according to EN 1852-1: 2009	Seal Position	Min. Seal Depth (mm)	Backing		Permitted Configuration for Seal Separation	Fire Resistance (mins.)	
Gypsum board, Masonry/Concrete	100	Diameter up to 40 mm, wall thickness 4.0 – 5.5 mm	Both Sides	25	50 mm Stone wool 140 kg/m ³	50 x 1.8 mm	1 & 2 between PVC-U/PVC-C, PE/ABS/SAN+ PVC and PP pipes in any combination	120	120
		Diameter up to 110 mm, wall thickness 6.6 mm				50 x 3.6 mm		120	90
		Diameter up to 125 mm, wall thickness 17.1 mm				50 x 5.4 mm		120	120
		Diameter up to 160 mm, wall thickness 4.0 - 21.9 mm				50 x 7.2 mm		120	120
		Diameter up to 160 mm, wall thickness 21.9 mm							60

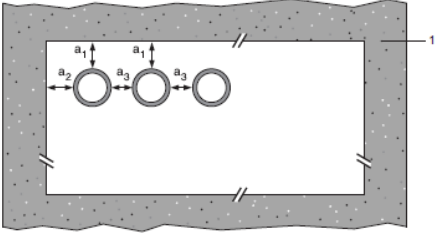
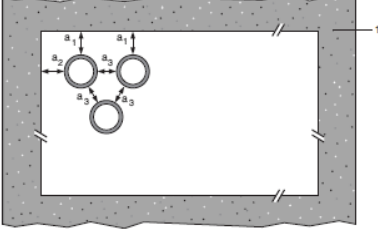
Penetration Seal: Combustible pipes sealed with Protecta FR Wrap, installed into Protecta EX Mortar seals. Minimum separation between penetration seals and seal edges of 30 mm. Maximum seal size 2400 mm wide x 1200 mm high.

All pipe configurations are uncapped /capped (U/C) (U=Uncapped, C=Capped).



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Configuration 1	Configuration 2
	
<p>Key 1 Supporting construction a1 Pipe / top edge of seal separation a2 Pipe / side edge of seal separation a3 Pipe / pipe separation</p>	



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PROTECTA EX MORTAR: Service Penetration Seals in Walls

Substrate	Minimum Substrate Thickness (mm)	Maximum Opening Size (mm)	Penetrating Services - Mild or stainless steel pipe insulated with CS 13-32 mm Elastomeric insulation minimum class B-s3,d0 or PE Foam insulation	Seal Position	Minimum Seal Depth (mm)	Additional component	Fire Resistance (mins.)	
							E	EI
Drywall/ Masonry/ Concrete	100	2400 wide x 1200 high	40 mm diameter/1-14.2 mm wall*	No restriction but 50 mm seals must be back to back	100 (50 mm applied from both sides of wall)	2 off 50 x 3.6 mm Protecta FR Pipe Wrap, one fitted flush to each face of seal	120	60
			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*								

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.

* Typical pipe diameters shown, intermediate sizes are possible

LS = Local Sustained
 CS = Continuous Sustained
 LI = Local Interrupted
 CI = Continuous Interrupted

All pipe configurations are capped/uncapped (C/U)

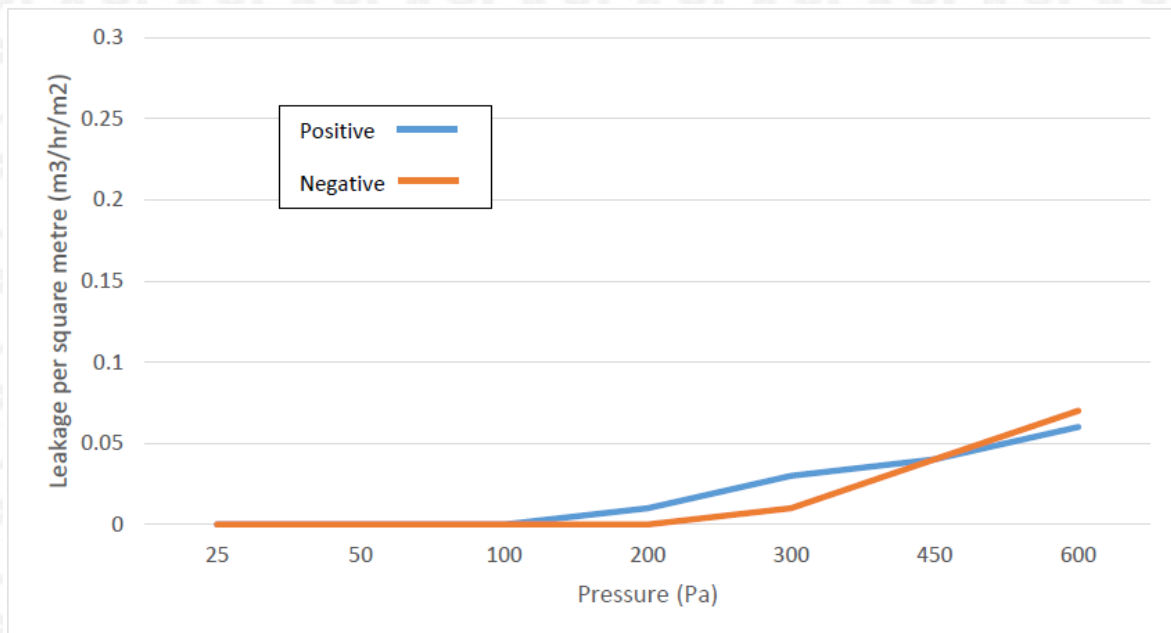


Appendix UL-EU CERTIFICATE

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Protecta EX Mortar: Air permeability performance according to BS EN 1026: 2016

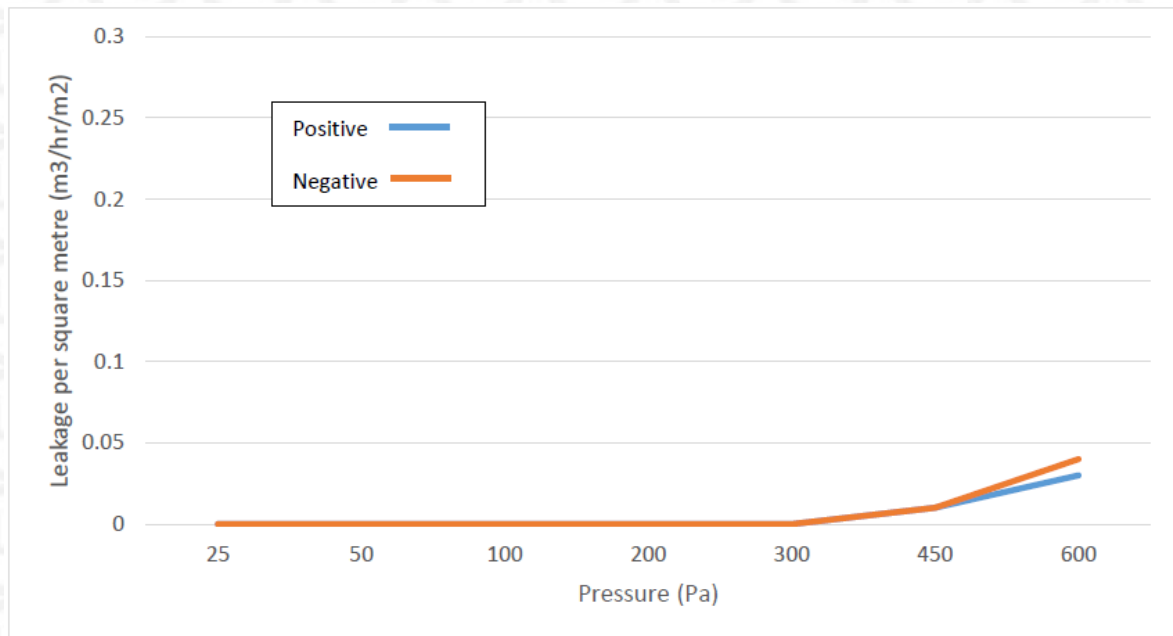
Product tested	1200 mm high x 600 mm wide x 50 mm deep Protecta EX Mortar		
	Summary of testing procedure		Result
	Pressure (Pa)	Leakage (m ³ /h)	Leakage (m ³ /m ² /h)
Results under negative chamber pressure	25	0.00	0.00
	50	0.00	0.00
	100	0.00	0.00
	200	0.00	0.00
	300	0.01	0.01
	450	0.03	0.04
	600	0.05	0.07
Results under positive chamber pressure	25	0.00	0.00
	50	0.00	0.00
	100	0.00	0.00
	200	0.01	0.01
	300	0.02	0.03
	450	0.03	0.04
	600	0.04	0.06



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Product tested	600 mm high x 600 mm wide x 100 mm deep Protecta EX Mortar inc. 110 mm plastic pipe with 2no layers 50 mm x 1.8 mm Protecta FR Wrap cast to one face in centre of seal		
Summary of testing procedure		Result	
	Pressure (Pa)	Leakage (m ³ /h)	Leakage (m ³ /m ² /h)
Results under negative chamber pressure	25	0.00	0.00
	50	0.00	0.00
	100	0.00	0.00
	200	0.00	0.00
	300	0.00	0.00
	450	0.01	0.01
	600	0.03	0.04
Results under positive chamber pressure	25	0.00	0.00
	50	0.00	0.00
	100	0.00	0.00
	200	0.00	0.00
	300	0.00	0.00
	450	0.01	0.01
	600	0.02	0.03



Appendix UL-EU Certificate

Certification Mark	UL-EU mark
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The UL-EU Mark, as displayed below, shall appear on certified products only. Minimum size is not specified, as long as the Mark is legible. The following is suggested.



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 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.

