UL-EU CERTIFICATE

Certificate No.	UL-EU-00912-CPR
Page	1/60
Date of Issue	2015-10-09
Revision	2020-11-27
Certificate Holder	Polyseam Ltd 15 St Andrews Road Huddersfield, West Yorkshire HD1 6SB, UK
Manufacturer	Polyseam Ltd 15 St Andrews Road Huddersfield, West Yorkshire HD1 6SB, UK
Certified Product Type	Fire Stop - Sealant
Product Trade Name	Protecta FR Acrylic
Trademark	N/A
Rating/Classification	See Appendix
Harmonised Technical Specifications	EAD 350454-00-1104, September 2017/ EAD 350141-00-1106, September 2017 / EN 13501-2
Supporting Documentation	ETA 18/0904, ETA 13/0879, EC – CERTIFICATE OF CONFORMITY - 0843 – CPR – 0139 and Classification Report No. 13CA21782 A Issue 2 / 4786594903 A Issue 2 / 4788077223 Issue 1 / 4788672831 Issue 1 / 4789129519 Issue 1/ 4789553848
Additional information	Additional test evidence is held on file
Expiry date	2025-10-08

UL EU

UKAS PRODUCT CERTIFICATION 4705

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shall remain valid through the Expiration date, unless a Standard identified on this Certificate is amended or withdrawn prior to that date or there is a non-compliance with the Agreement.

Appendix UL-EU CERTIFICATE

This certificate relates to the use of Protecta FR Acrylic for fire stopping where there are joints in or between walls & floors or service penetrations through floors and walls. The detailed scope is given in pages 3 to 58 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 18/0904 & ETA 13/0879
ii) EC – CERTIFICATE OF CONFORMITY - 0843 – CPD – 0139
iii) Inspection and surveillance of factory production control by UL
iv) Fire resistance test data in accordance with EN 1366-3 and 1366-4
v) Classification in accordance with EN 13501-2
vi) Durability and Serviceability as defined in EAD 350141-00-1106*

* Protecta FR Acrylic sealant has been tested in accordance with BS EN ISO 8339: 2005 and BS EN ISO 9046: 2004 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 Z_2 in EAD 350454-00-1104, September 2017 and EAD 350141-00-1106.

The movement capability of Protecta FR Acrylic joint seals is restricted to ≤ 7.5%

Protecta FR Acrylic is a sealant used to form a penetration seal around metallic pipes with and without combustible insulation, plastic pipes, combustible cable conduits, composite pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services. It is also used to form linear gap seals where gaps are present in wall and floor constructions and linear joint seals where wall and floor constructions abut.

Protecta FR Acrylic is supplied in liquid form contained within 310 & 380 ml cartridges and 300 to 600 ml foil packs. The sealant is gunned into the aperture in the separating element/elements and around the service or services, to a specified depth utilising a backing material.

Appendix UL-EU CERTIFICATE

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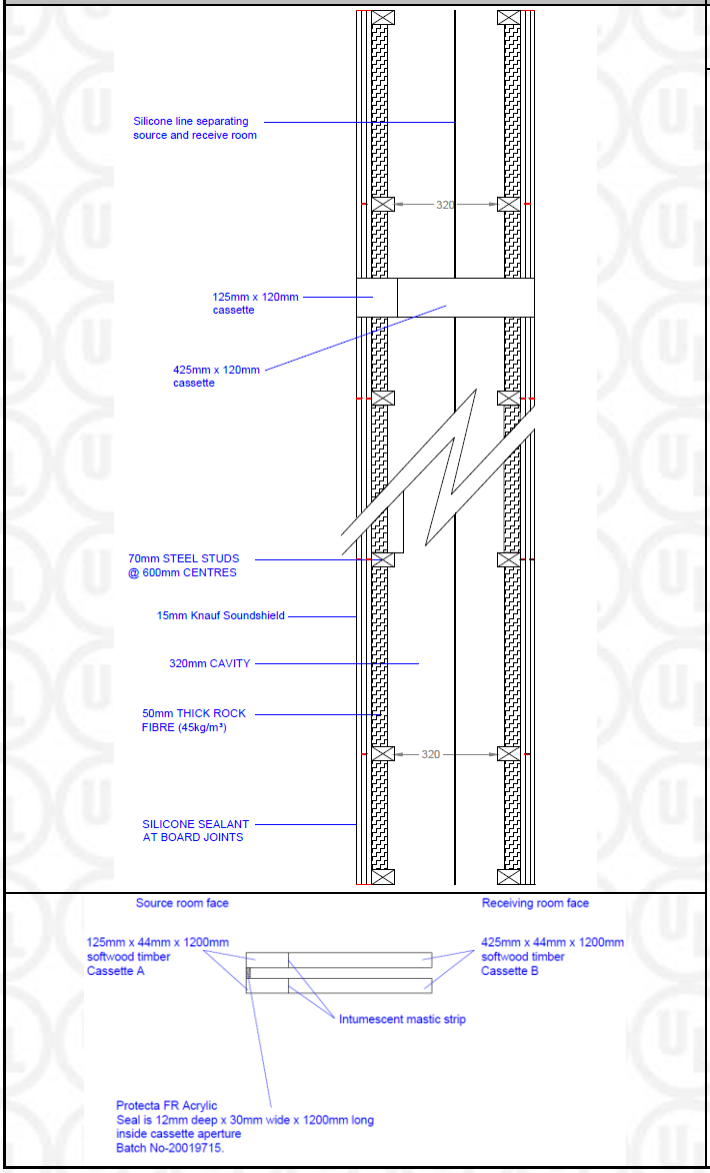
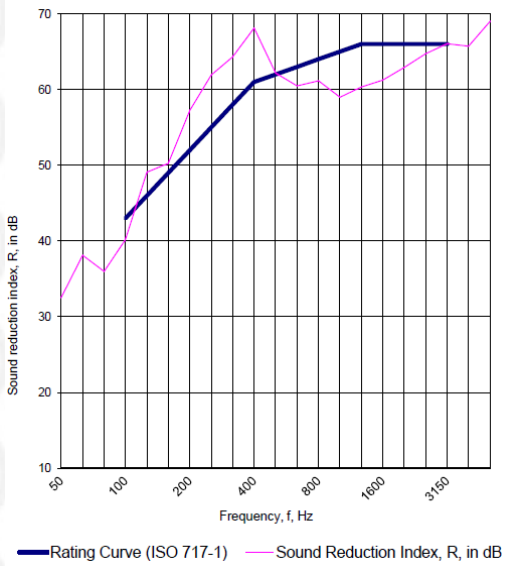
Date of Issue 2015-10-09

Product: Protecta FR Acrylic		
Product-type: Sealant	Intended use: Linear Joint, Gap Seal & Penetration Seal	
Assessment method	Essential characteristic	Product Performance
BWR 2 Safety in case of fire		
EN 13501-1	Reaction to fire	Class B-s1, d0
EN 13501-2	Resistance to fire	See pages 5 to 43
BWR 3 Hygiene, health and environment		
Declaration of manufacturer & EN 16516	Content, emission and/or release of dangerous substances	Use categories: IA1, S/W2 Declaration of manufacturer
EN 1026:2000	Air permeability (material property)	See page 59
EAD 350141-00-1106, Annex C & EN 12390-8	Water permeability (material property)	No performance determined
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 ISO 11600 & EAD 350141-00-1106, Clause 2.2.13	Adhesion	No performance determined
EAD 350141-00-1106, Clause 2.2.12	Durability	Z_2
EAD 350141-00-1106, Clause 2.2.13	Movement capacity	No performance determined
EAD 350141-00-1106, Clause 2.2.14	Cycling of perimeter seals for curtain walls	No performance determined
EAD 350141-00-1106, Clause 2.2.15	Compression set	No performance determined
EAD 350141-00-1106, Clause 2.2.16	Linear expansion on setting	No performance determined
BWR 5 Protection against noise		
EN 10140-1,2,4,5/ EN ISO 717-1	Airborne sound insulation	Rw(C;Ctr)= 62 (-1;-5) dB*
BWR 6 Energy economy and heat retention		
EN 12664, EN 12667, EN 12939, EN ISO 8990, EN ISO 6946, EN ISO 10456	Thermal properties	No performance determined
EN ISO 12572, EN 12086, EN ISO 10456	Water vapour permeability	No performance determined
*12 mm depth and only applicable to linear joint and gap seals		

Appendix UL-EU CERTIFICATE

Protecta FR Acrylic: Acoustic performance according to BS EN ISO 10140-2:2010

Configuration	$R_w(C; C_{tr})$
	62 (-1;-5) dB 37 (0; -2)



Appendix UL-EU CERTIFICATE

PROTECTA FR Acrylic: Single Sided Penetration Seals in Walls								
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Maximum Seal Size**	**Fire Resistance (mins.)**	
							E	**EI**
Masonry/ Concrete	150	Single electrical cables up to 21 mm Ø	25 (to either face of wall)	Protecta Mineral Fibre BIO	48	87 mm Ø	240	90
		Blank seals				300 x 300 mm	240	60
		Single electrical cables up to 21 mm Ø						
		Blank seals				35 x 35 mm / 36 mm Ø	240	120
		Single electrical cables up to 21 mm Ø						

Minimum separation between cables and the edge of the seal of 7 mm.

Appendix UL-EU CERTIFICATE

PROTECTA FR Acrylic: Double Sided Penetration Seals in Walls								
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Maximum Seal Size**	**Fire Resistance (mins.)**	
							E	**EI**
Masonry/ Concrete	150	Blank seals	15	Stone wool 35 kg/m^3	25	300 x 300 mm	240	240
		Electric cables up to 21 mm diameter, single or in a bundle.					240	120
		Electric cables 22-80 mm diameter, single or in a bundle.					120	60
		Blank seals	25	Protecta Mineral Fibre BIO	48		240	240
		Electric cables up to 80 mm diameter, single or in a bundle.					240	60
		Telecoms cables up to 21 mm diameter, single or in a bundle up to 100 mm diameter					240	240

Minimum separation between cables and the edge of the seal of 10 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Walls 15 mm deep Protecta FR Acrylic / 20 mm deep minimum 40 kg/m^3 stone wool backing						
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Seal Width Around Pipe (mm)**	**Insulation LI or CI**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	Copper or steel pipe up to 54 mm diameter/0.9-14.2 mm wall	8-9	1000 mm length 20 mm Stone wool insulation 80 kg/m3	240	180
		Copper or steel pipe up to 12 mm diameter/0.9-5 mm wall	8		240	240
		Alupex composite pipe 75 mm diameter/7.5 mm wall	30	25 mm Protecta Mineral Fibre BIO insulation, 600 mm long (min.)	120	120
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Seal Width Around Pipe (mm)**	**Insulation LI or CI**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	40 mm diameter/1.5-14.2 mm wall*	6-18	1000 mm length of 20 mm Stone wool insulation 80 kg/m^3	240	240
		40 mm diameter/1.5-14.2 mm wall*		1000 mm length of 30 mm Stone wool insulation 80 kg/m^3	180	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 diameter/ 5.0-14.2 mm wall*				

LI = Local Interrupted
CI = Continuous Interrupted

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

* Typical pipe diameters shown, intermediate sizes are possible.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Walls 25 mm deep Protecta FR Acrylic / 25 mm deep 40 kg/m^3 stone wool backing						
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Maximum Seal Size (mm)**	**Insulation LI or CI**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	Copper or steel pipe up to 54 mm diameter/0.9-14.2 mm wall	300 x 300	1000 mm length 20 mm Stone wool insulation 80 kg/m^3	240	60
		Alupex composite pipe 75 mm diameter/7.5 mm wall		25 mm Protecta Mineral Fibre BIO insulation, 600 mm long (min.)		
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Maximum Seal Size (mm)**	**Insulation LI or CI**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	40 mm diameter/1.5-14.2 mm wall*	300 x 300	1000 mm length of 20 mm Stone wool insulation 80 kg/m^3	240	60
		40 mm diameter/1.5-14.2 mm wall*		1000 mm length of 30 mm Stone wool insulation 80 kg/m^3		
		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*				

LI = Local Interrupted
CI = Continuous Interrupted

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

* Typical pipe diameters shown, intermediate sizes are possible.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Walls 25 mm deep Protecta FR Acrylic / 48 mm deep Protecta Mineral Fibre BIO backing - Maximum seal size 300 x 300 mm or 504 mm Ø						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Seal Width Around Pipe (mm)**	**Insulation CS**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	40 mm diameter/1.0-14.2 mm wall*	10	20 mm thick stone, mineral wool min. 80 kg/m^3	240	240
		40 mm diameter/1.0-14.2 mm wall*		30-80 mm thick stone, mineral wool min. 80 kg/m^3	180	180
		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*				

CS = Continuous Sustained

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

* Typical pipe diameters shown, intermediate sizes are possible.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 15 mm deep Protecta FR Acrylic / 20 or 30 mm deep minimum 40 kg/m^3 stone wool backing						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Maximum Seal Size (mm)**	**Insulation LI or CI**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	40 mm diameter/1.5-14.2 mm wall*	300 x 300	1000 mm length of 20 mm Stone wool insulation 80 kg/m^3	240	240
		40 mm diameter/1.5-14.2 mm wall*		1000 mm length of 30 mm Stone wool insulation 80 kg/m^3	240	120
		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*				

LI = Local Interrupted
CI = Continuous Interrupted

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

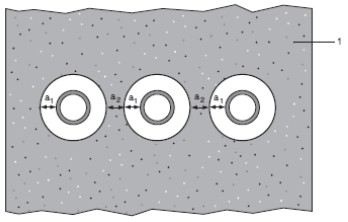
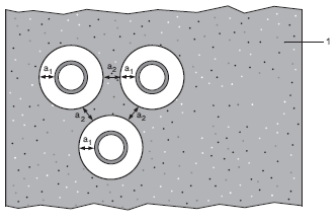
* Typical pipe diameters shown, intermediate sizes are possible.

** seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 15 mm deep Protecta FR Acrylic / 25 mm deep stone wool insulation minimum 35 kg/m^3 backing - Maximum seal size 300 x 300 mm or 504 mm Ø						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Insulation CS**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	40 mm diameter/1.0-14.2 mm wall*	10 mm	20 mm stone, mineral wool min. 80 kg/m^3	240	240
		40 mm diameter/1.0-14.2 mm wall*		30-80 mm thick stone, mineral wool min. 80 kg/m^3		
		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*				

CS = Continuous Sustained
All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

Configuration 1	**Configuration 2**
	

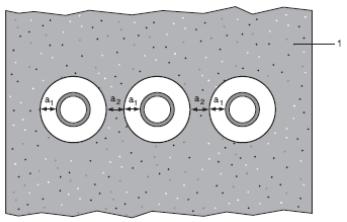
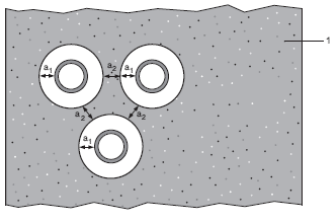
Key
1 Supporting construction
a_1 Pipe / edge of seal separation (annular space) = 10 mm
a_2 Separation between penetration seals = 30 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 25 mm deep Protecta FR Acrylic / 25 mm deep stone wool insulation minimum 35 kg/m^3 backing - Maximum seal size 300 x 300 mm or 300 mm Ø						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Insulation CS**	**Fire Resistance (mins.)**	
					E	**EI**
Masonry/ Concrete	150	22 mm diameter/2-11 mm wall	10 mm	13 mm thick Elastomeric insulation minimum class B-s3, d0	240	180
		22-114 mm diameter/2-14.2 mm wall		13-25 mm thick Elastomeric insulation minimum class B-s3, d0	120	90
		22-114 mm diameter/2-14.2 mm wall		25-50 mm thick Elastomeric insulation minimum class B-s3, d0	60	60

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

** seal applied to both sides of the wall

Configuration 1	**Configuration 2**
	

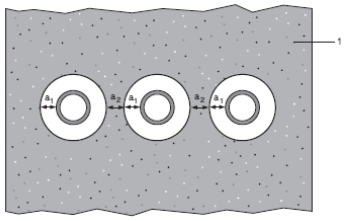
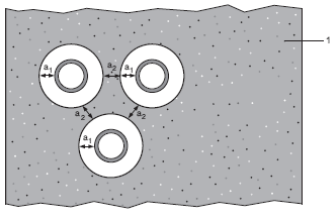
Key
1 Supporting construction
a_1 Pipe / edge of seal separation (annular space) = 10 mm
a_2 Separation between penetration seals = 30 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 25 mm deep Protecta FR Acrylic / 25 mm deep stone wool insulation minimum 35 kg/m³ backing - Maximum seal size 300 x 300 mm or 300 mm Ø							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Sealant Depth (mm)**	**Backing Material**	**Fire Resistance (mins.)**	
						E	**EI**
Masonry/ Concrete	150	PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1 6-32 mm Ø/1.0-2.4 mm wall	10 mm	25	25 mm stone wool insulation min. 35 kg/m³	240	240
		PP pipe according to EN 1451-1 or DIN 8077/8078 32 mm Ø/2.0-4.4 mm wall				180	180
		PP pipe according to EN 1451-1 or DIN 8077/8078 12-32 mm Ø/1.8-4.4 mm wall				240	240
		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 20-32 mm Ø /2.0 mm wall				240	240
		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 20-32 mm diameter/2.0-4.4 mm wall				120	120

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

** seal applied to both sides of the wall

Configuration 1	**Configuration 2**
	

Key
1 Supporting construction
a_1 Pipe / edge of seal separation (annular space) = 10 mm
a_2 Separation between penetration seals = 30 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls							
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material**	**Maximum Seal Size**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	75	None (blank)	12.5	Any material	150 x 150 mm^	60	60
		Electric cables up to 21 mm Ø, single		none		60	45
		Electric cables up to 21 mm Ø, in bundles up to 100 mm Ø				45	30
Mild or stainless steel pipe							
Drywall/ Masonry/ Concrete	75	4 mm diameter /0.7-2.0 mm wall	12.5	none	150 x 150 mm^	60	45
		5-22 mm diameter /0.7-11 mm wall*				60	30
Mild or stainless steel pipe with minimum 80 kg/m^3 density stone wool insulation Continuous Sustained (CS)							
Drywall/ Masonry/ Concrete	75	40 mm diameter /1-14.2 mm wall, 20 mm insulation	12.5	none	150 x 150 mm^	60	45
		40-324 mm diameter /1.0-14.2 mm wall, 30 mm insulation*					
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Drywall/ Masonry/ Concrete	75	6-32 mm Ø/1.0-1.8 mm wall, with bundle of cables up to 21 mm diameter*	12.5	none	150 x 150 mm^	60	45
PP pipe according to EN 1451-1							
Drywall/ Masonry/ Concrete	75	20 mm Ø/2.3 mm wall	12.5	none	150 x 150 mm^	45	45
		21-32 mm Ø/2.3-4.4 mm wall*				30	30
		21-32 mm Ø/2.3-4.4 mm wall, with bundle of cables up to 21 mm diameter*				45	30
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							
Drywall/ Masonry/ Concrete	75	20 mm Ø/2.0 mm wall	12.5	none	150 x 150 mm^	45	45
		21-32 mm Ø/2.0-3.0 mm wall*				30	30
		21-32 mm Ø/2.0-3.0 mm wall, with bundle of cables up to 21 mm* diameter				45	30

All metal or stainless steel pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).
All plastic pipe classifications are pipe end configuration U/C (U=Uncapped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.

** seal applied to both sides of the wall

^ Or 344 mm diameter when incorporating a pipe of seal diameter -20 mm.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls								
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Maximum Seal Size**	**Fire Resistance (mins.)**	
							E	**EI**
Drywall/ Masonry/ Concrete	100	None (blank)	12.5	Stone wool 35-140 kg/m^3	20	300 x 300 mm*	120	120
		Cables up to 21 mm Ø, single or in bundles up to 50 mm Ø	12.5	Stone wool min. 33 kg/m^3	12.5		120	90
		Electrical cables up to 21 mm Ø, single or in bundles up to 100 mm Ø	25	Stone wool min. 40 kg/m^3	20		120	120
		Electrical cables up to 80 mm Ø, single or in bundles up to 100 mm Ø		Protecta Mineral Fibre BIO	25		120	60
		Single ‘E cable’ - 1 x 185 mm2 core HD603.3 electrical cable with PVC insulation, PVC sheath and 23-27 mm diameter	12.5	Stone wool min. 140 kg/m^3	20		120	60

* Or 30 mm wide x 3000 mm high for cables up to 21 mm Ø

** seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Walls 25 mm deep Protecta FR Acrylic							
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material**	**Maximum Annular Space (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Drywall/ Masonry/ Concrete	100	Maximum diameter 40 mm, wall thickness 1.0-1.9 mm for PVC pipes, fully or partially filled conduits with cables up to 21 mm diameter	25	none	30	120	120
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							
Drywall/ Masonry/ Concrete	100	Maximum diameter 40 mm, wall thickness 2.0-3.0 mm for PE pipes, fully or partially filled conduits with cables up to 21 mm diameter	25	none	30	90	90
PP pipe according to EN 1852-1: 2009							
Drywall/ Masonry/ Concrete	100	Maximum diameter 40 mm, wall thickness 1.8-2.2 mm for PP pipes, fully or partially filled conduits with cables up to 21 mm diameter	25	none	30	90	90

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

* seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 300 x 300 mm maximum seal size.							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	22 mm diameter/3-10 mm wall	25	Stone wool, 25 mm deep, 35 kg/m^3	None	120	120
		Maximum 165 mm diameter/ wall*^	12.5	Stone wool, 12.5 mm deep, 33 kg/m^3	9 mm Elastomeric insulation minimum class D-s3, d0	90	45
					13 -25 mm Elastomeric insulation minimum class D-s3, d0	60	60
		40 mm diameter/1-14.2 mm wall	12.5	Stone wool, 20 mm deep, 40 kg/m^3	13 -19 mm Elastomeric insulation minimum class B-s3, d0	120	120
		40 mm diameter/1-14.2 mm wall*	25	25 mm Protecta Mineral Fibre BIO		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*					

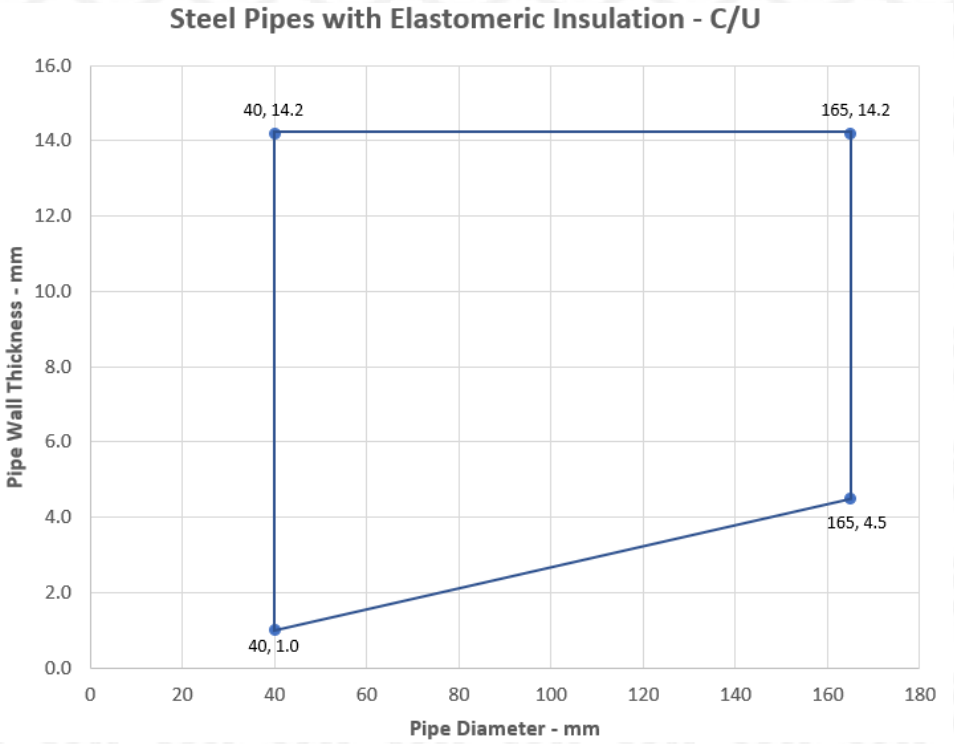
CS = Continuous Sustained

All pipe classifications are pipe end configuration C/C (C=Capped) except for those marked ^ which are C/U (U=Uncapped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.

** seal applied to both sides of the wall

Appendix UL-EU Certificate



Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Copper or steel Pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	12 mm diameter/1-6 mm wall	25 mm	25 mm Protecta Mineral Fibre BIO	9 mm Elastomeric insulation minimum class B-s3, d0	120	120
		12-54 mm diameter/1-14.2 mm wall*			9-13 mm Elastomeric insulation minimum class B-s3, d0	120	60
		12-54 mm diameter/1-14.2 mm wall*			13-25 mm Elastomeric insulation minimum class B-s3, d0	60	60
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Alupex Composite Pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	16 mm diameter/ wall*	12.5 mm	12.5 mm stone wool 33 kg/m3	9 mm Elastomeric insulation minimum class D-s3, d0	120	90
		Maximum 75 mm diameter/ wall*				60	45
					13-24 mm Elastomeric insulation minimum class D-s3, d0	90	60
					25 mm Elastomeric insulation minimum class D-s3, d0	90	90
		16 mm diameter/2.25 mm wall	25 mm	25 mm Protecta Mineral Fibre BIO	9 mm Elastomeric insulation minimum class B-s3, d0	120	120
		16 mm diameter/2.25 mm wall			9-25 mm Elastomeric insulation minimum class B-s3, d0	60	60
		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					

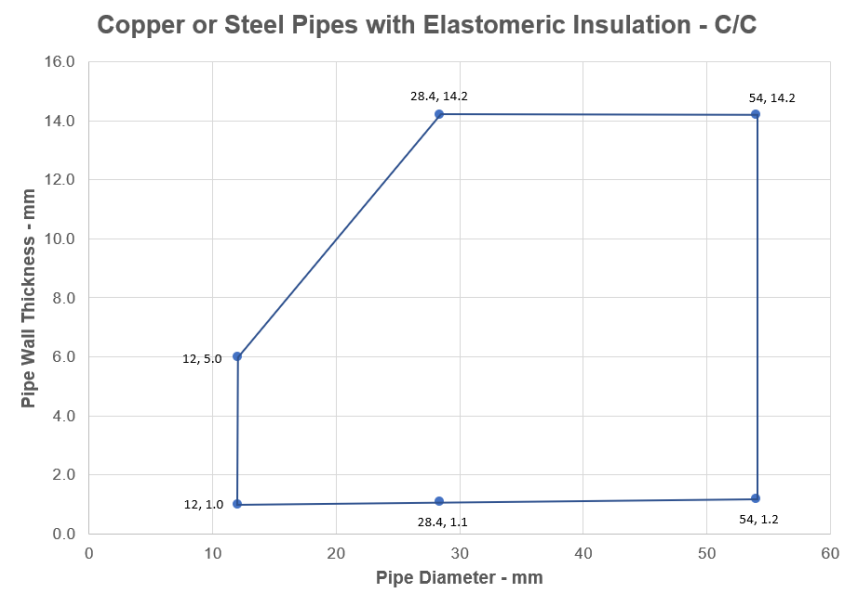
CS = Continuous Sustained

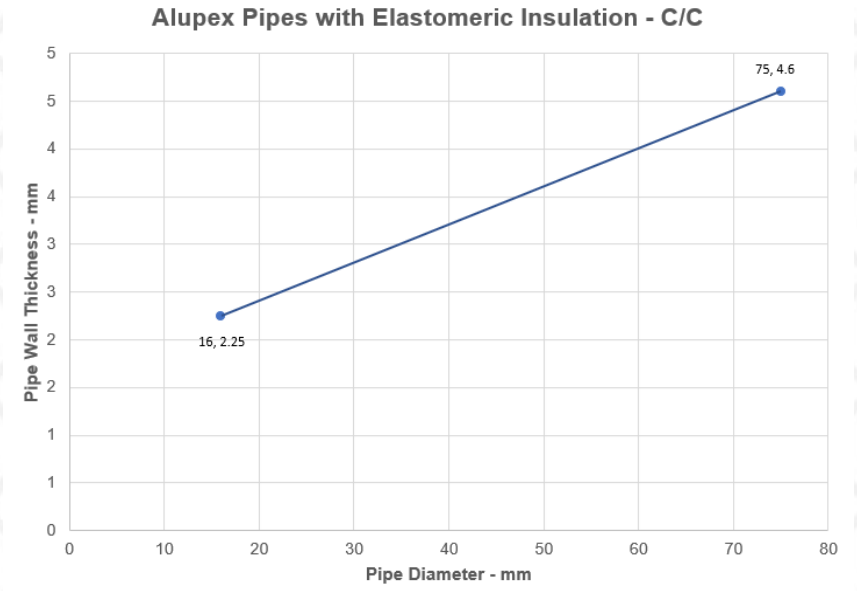
All pipe classifications are pipe end configuration C/C (C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.

** seal applied to both sides of the wall

Appendix UL-EU Certificate





Appendix UL-EU Certificate

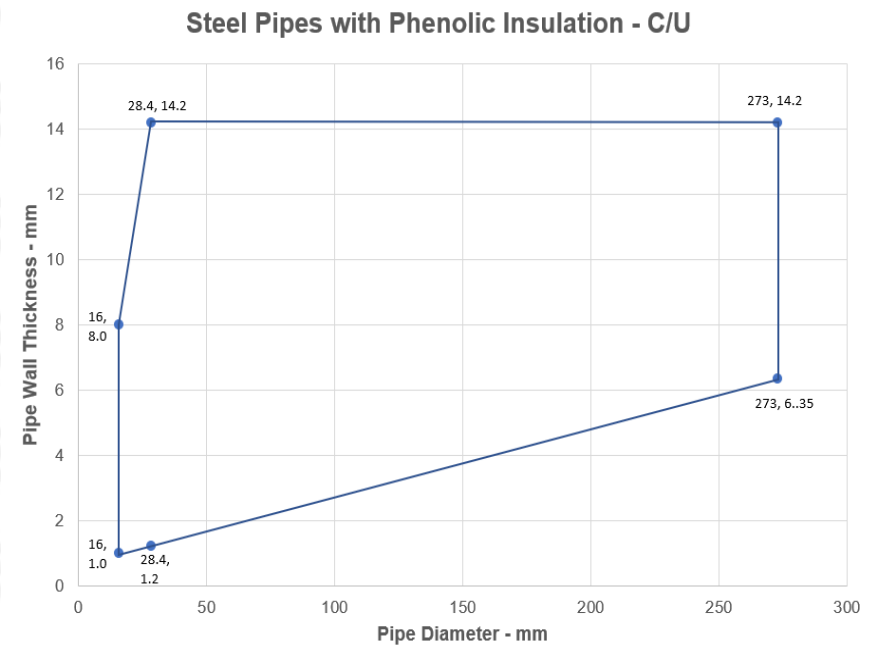
PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or stainless steel Pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	16 mm diameter/ wall*	25 mm	None	15 mm thick phenolic insulation	90	90
		Maximum 273 mm/ wall*			25 mm thick phenolic insulation	90	60
					26-100 mm thick phenolic insulation	60	60

CS = Continuous Sustained

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

* Typical pipe diameters shown, intermediate sizes are possible.

** seal applied to both sides of the wall



Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 12.5 mm deep Protecta FR Acrylic / 12.5 mm deep stone wool insulation minimum 35 kg/m³ backing - Maximum seal size 300 x 300 mm or 504 mm Ø						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Insulation CS**	**Fire Resistance (mins.)**	
					E	**EI**
Drywall/ Masonry/ Concrete	100	40 mm diameter/1.0-14.2 mm wall*	10 mm	20 mm Stone wool insulation min. 80 kg/m³	120	90
		40 mm diameter/1.0-14.2 mm wall*		30-80 mm thick stone, mineral wool min. 80 kg/m³		
		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)**	**Services – PEX pipe in pipe system (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Insulation**	**Fire Resistance (mins.)**	
					E	**EI**
Drywall/ Masonry/ Concrete	100	15 mm diameter x 2.5 mm wall inner /25mm diameter outer	10 mm	None	120	120
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Alupex pipe in pipe system (fitted centrally)**	**Seal Width Around Pipe (a1)**	**Insulation**	**Fire Resistance (mins.)**	
					E	**EI**
Drywall/ Masonry/ Concrete	100	16-20 mm diameter/ 2.0 mm wall	10 mm	None	120	120
		16-75 mm diameter/2.25-4.6 mm		20-50 mm thick glass wool or stone, mineral wool min. 75 kg/m³		

CS = Continuous Sustained

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped) Except PEX and Alupex pipes which are C/C.

* Typical pipe diameters shown, intermediate sizes are possible.

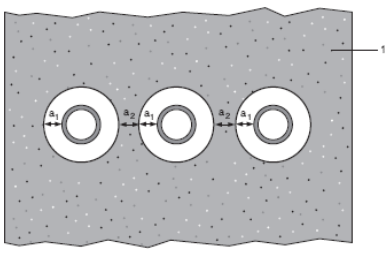
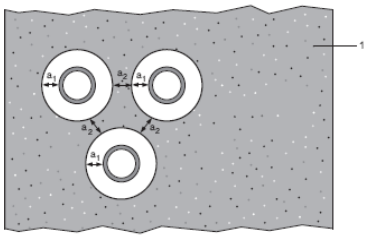
** seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls 12.5 mm deep Protecta FR Acrylic / 12.5 mm deep stone wool insulation minimum 35 kg/m^3 backing - Maximum seal size 300 x 300 mm or 504 mm Ø						
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe**	**Seal Width Around Pipe (a1)**	**Insulation CS**	**Fire Resistance (mins.)**	
					E	**EI**
Drywall/ Masonry/ Concrete	100	4 mm diameter/1.0-2.0 mm wall	10 mm	None	90	90
		5-30 mm diameter/1.0-14.2 mm wall*				
		30 mm diameter/2.0-14.2 mm wall#			120	120
Substrate	**Minimum Substrate Thickness (mm)**	**Copper or Steel pipe**	**Seal Width Around Pipe (a1)**	**Insulation**	**Fire Resistance (mins.)**	
					E	**EI**
Drywall/ Masonry/ Concrete	100	6-12 mm diameter/0.7-6.0 mm wall*	10 mm	None	90	60
		13-22 mm diameter/0.7-11 mm wall*			90	30
		12-54 mm diameter/0.9-14.2 mm wall*		20-80 mm thick stone, mineral wool min. 80 kg/m3	120	60

CS = Continuous Sustained
All pipe classifications are pipe end configuration C/C, except for those marked "#" which are C/U (U=Uncapped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

Configuration 1	**Configuration 2**
	

Key
1 Supporting construction
a_1 Pipe / edge of seal separation (annular space) = 10 mm
a_2 Separation between penetration seals = 30 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Walls Maximum seal size 300 x 300 mm							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe) (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	16 mm diameter/2.25 mm wall	12.5 mm	12.5 mm Stone wool 40 kg/m^3	20 mm Stone wool 80 kg/m^3, 500 mm length from both sides of the seal	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					

LI = Local Interrupted
CI = Continuous Interrupted

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

* seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls Maximum seal size 300 x 300 mm / min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	Copper or steel pipe up to 54 mm diameter/1-14.2 mm wall	12.5 mm	20 mm Stone wool 40 kg/m^3	500 mm length of 20 mm Stone wool 80 kg/m^3	120	120
		Alupex composite pipe 75 mm diameter/7.5 mm wall		20 mm Stone wool 140 kg/m^3	600 mm length of 25 mm Protecta Mineral Fibre BIO	60	60
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	100	40 mm diameter/1-14.2 mm wall	12.5	20mm Stone wool 40 kg/m^3	500 mm length of 20 mm stone wool 80 kg/m^3	120	120
		40 mm diameter/1-14.2 mm wall*			500 mm length of 30 mm stone wool 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*					

All pipe classifications are pipe end configuration C/U (U=Uncapped, C=Capped).
LI = Local Interrupted
CI = Continuous Interrupted

* Typical pipe diameters shown, intermediate sizes are possible.

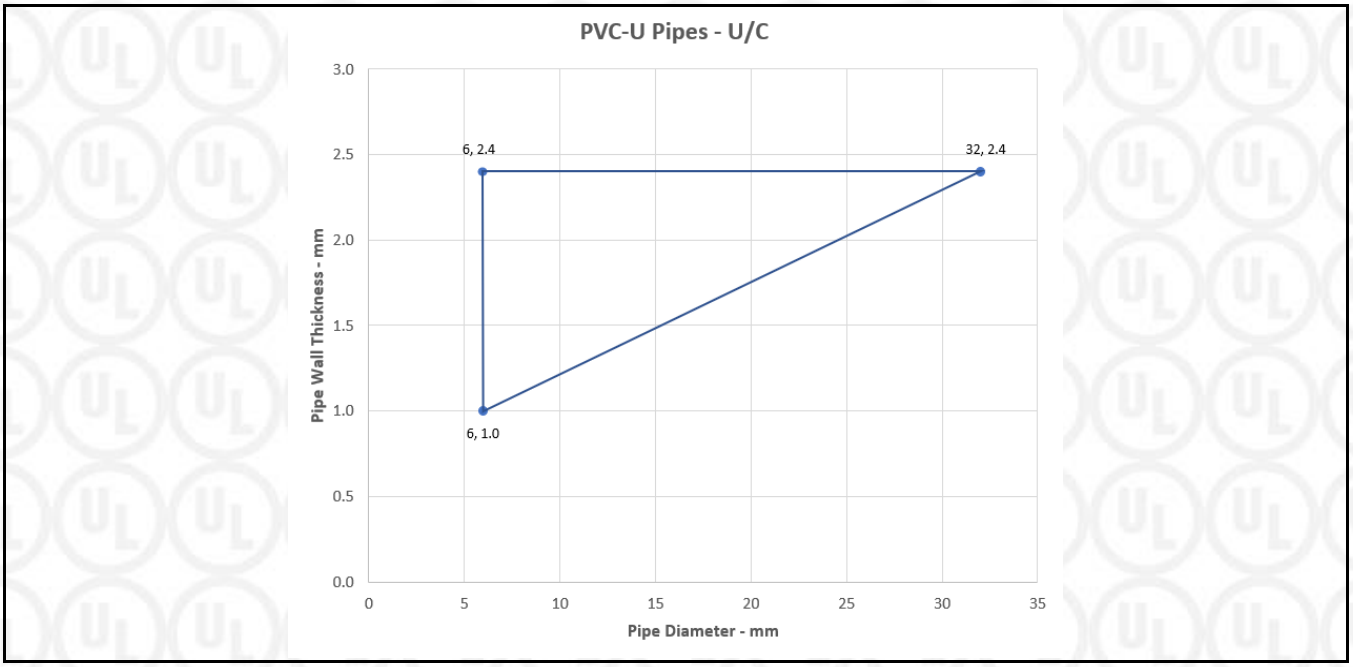
** seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls
25 mm deep Protecta FR Acrylic

Substrate	Minimum Substrate Thickness (mm)	Services (fitted centrally)	Sealant Depth (mm)	Backing Material	Maximum Annular Space (mm)	Fire Resistance (mins.)	
						E	EI
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Drywall/ Masonry/ Concrete	100	6-32 mm Ø/1.0-2.4 mm wall*	25	None	10	120	120
					30	120	90
		6-32 mm Ø/1.0-1.6 mm wall#				120	120
PP pipe according to EN 1451-1 or DIN 8077/8078							
Drywall/ Masonry/ Concrete	100	20 mm Ø/2.2 mm wall	25	none	30	120	120
		20 mm Ø/2.2-4.4 mm wall				60	60
		20-32 mm Ø/1.8-4.4 mm wall#					
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							
Drywall/ Masonry/ Concrete	100	20 mm Ø/2.0 mm wall	25	none	30	120	120
		20-32 mm Ø/2.0-3.0 mm wall#				90	90
Uponor Wirsbo PEX pipe in pipe system according to ISO 15875							
Drywall/ Masonry/ Concrete	100	Diameter up to 54 mm/0.4 mm wall thickness (outer pipe), 28 mm diameter/4.0 mm wall thickness (inner pipe)#	25	none	30	60	45

All pipe classifications are pipe end configuration U/C, except for those marked "#" which are C/C (U=Uncapped, C=Capped).
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall



Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Walls Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation**	**Fire Resistance (mins.)**	
						E	**EI**
Drywall/ Masonry/ Concrete	120	Mild or stainless steel pipe, 30 -324 mm diameter /1.6-14.2 mm wall#	15	15 mm Stone wool 35 kg/m^3	None	120	120
		Copper or steel pipe, 12 -54 mm diameter /0.9-14.2 mm wall		15 mm Stone wool 33 kg/m^3	None	120	120
		Alupex composite pipe 16-75 mm diameter/2.0-4.6 mm wall		15 mm Stone wool 35 kg/m^3	None	120	30

All pipe classifications are pipe end configuration C/C, except for those marked "#" which are C/U (U=Uncapped, C=Capped).

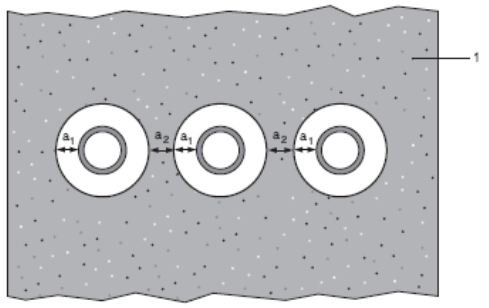
* seal applied to both sides of the wall

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Walls Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	None (blank)	25	25 mm Stone wool 33 kg/m^3	None	120	120
		Cables up to 14 mm Ø, single or in bundles up to 100 mm Ø			None	90	90
		Cables up to 21 mm Ø, single or in bundles up to 100 mm Ø			None	90	30
		Cables up to 50 mm Ø, single or in bundles up to 100 mm Ø			None		
		Telecom cables up to 14 mm Ø, single or in bundles up to 100 mm Ø			None	90	60

* seal applied to both sides of the wall

Configuration 1



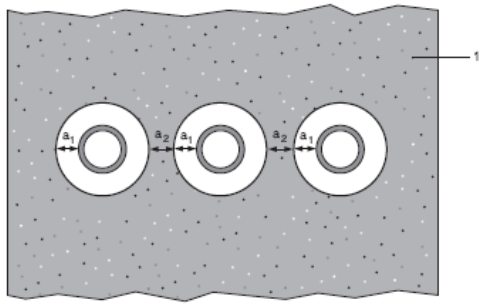
Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = 10 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Walls with Protecta FR Service Coat FR-1. Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	None (blank)	25	25 mm Stone wool 33 kg/m^3	Protecta Service Coat FR-1, 260-micron DFT extending 150 mm from both sides of the seal	120	120
		Cables up to 21 mm Ø, single				90	90
		Cables up to 50 mm Ø, single or in bundles up to 100 mm Ø				90	60

* seal applied to both sides of the wall

Configuration 1



Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = 10 mm
a2 Separation between penetration seals = 0 mm

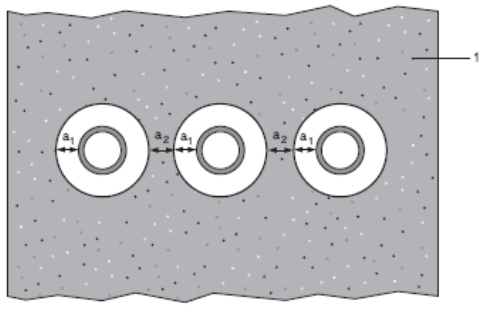
Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 273 mm diameter /6.35-14.2 mm wall*	25	25mm Stone wool 33 kg/m^3	25 mm glass wool or stone, mineral wool min. 75 kg/m^3, 500 mm length from both sides of the seal	90	60
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Copper or steel Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 54 mm diameter /1.2-14.2 mm wall*	25	25mm Stone wool 33 kg/m^3	20 mm glass wool or stone, mineral wool min. 75 kg/m^3, 500 mm length from both sides of the seal	90	60
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Alupex Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 75 mm diameter/wall 2.25-4.6 mm wall*	25	25mm Stone wool 33 kg/m^3	25 mm glass wool or stone, mineral wool min. 75 kg/m^3, 500 mm length from both sides of the seal	90	90

All pipe classifications are pipe end configuration C/C (C=Capped).
LI = Local Interrupted
CI = Continuous Interrupted

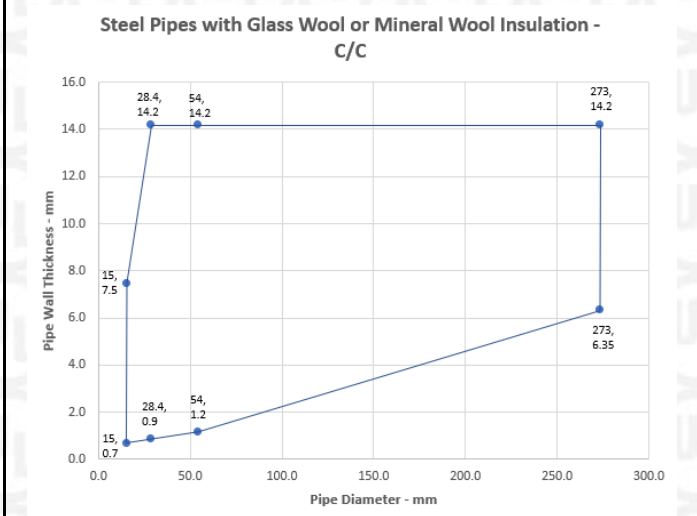
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

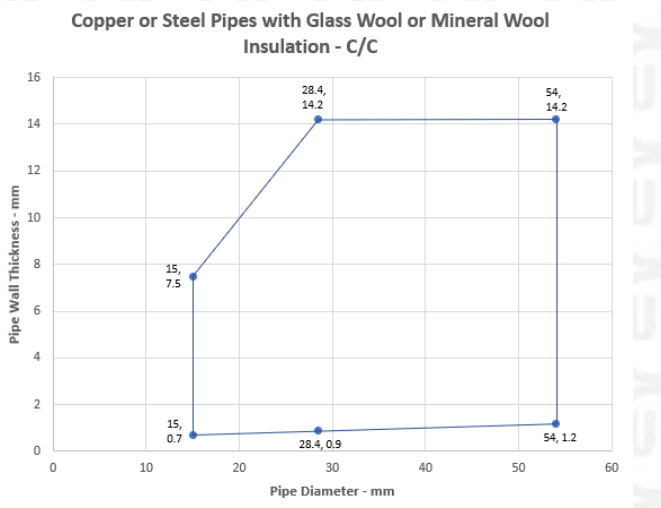
Configuration 1

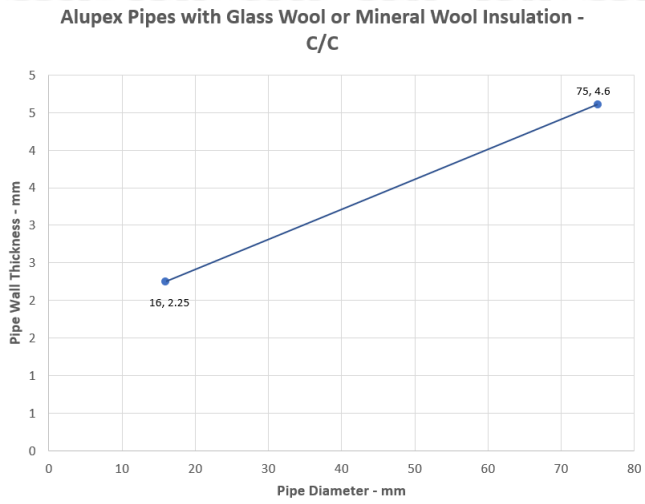


Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = 10 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate







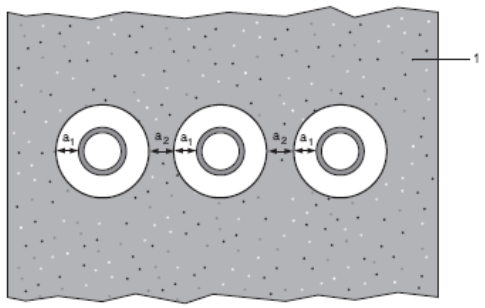
Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 114 mm diameter /1.5-14.2 mm wall*#	25	25mm Stone wool 33 kg/m^3	9-25 mm Elastomeric insulation minimum class D-s3, d0	30	30
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Copper or steel Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 12 mm diameter /0.7-6 mm wall*	25	25mm Stone wool 33 kg/m^3	9 mm Elastomeric insulation minimum class D-s3, d0	90	60
		Maximum 54 mm diameter /1.2-14.2 mm wall*				60	30
		Maximum 54 mm diameter /1.2-14.2 mm wall*			10-25 mm Elastomeric insulation minimum class D-s3, d0	30	20
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Alupex Pipe**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	100	Maximum 16 mm diameter/wall 2.25 mm wall*	25	25mm Stone wool 33 kg/m^3	9 mm Elastomeric insulation minimum class D-s3, d0	90	90
		Maximum 75 mm diameter/wall 4.6 mm wall*				60	45
		Maximum 75 mm diameter/wall 4.6 mm wall*			10-25 mm Elastomeric insulation minimum class D-s3, d0	45	45

All pipe classifications are pipe end configuration C/C, except for those marked "#" which are C/U (U=Uncapped, C=Capped).
LI = Local Interrupted
CI = Continuous Interrupted

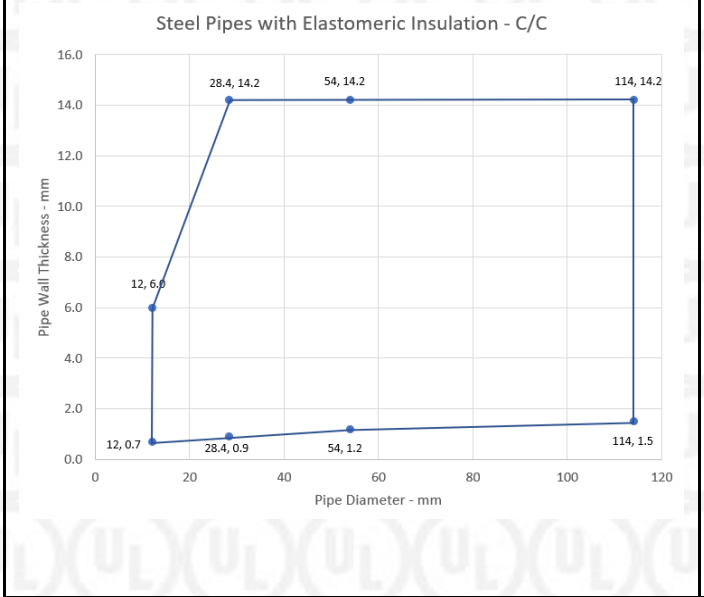
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

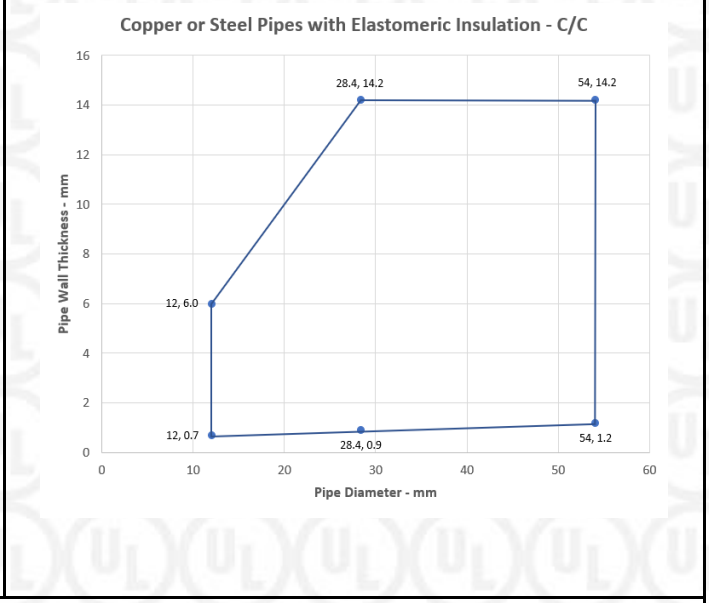
Configuration 1

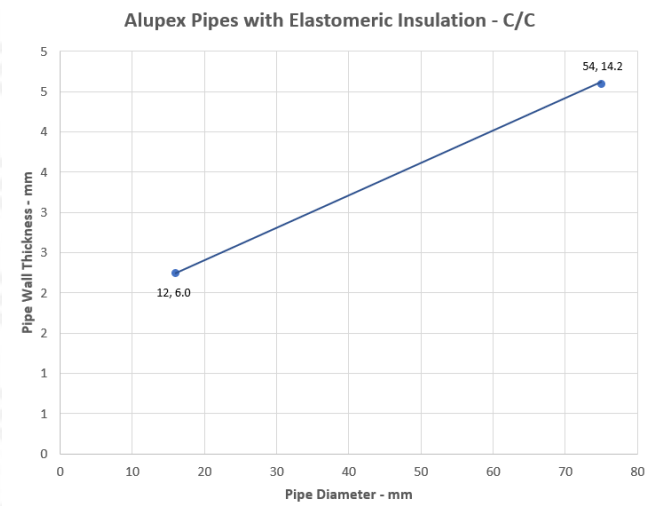


Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = Min. 10 mm & Max 30 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate







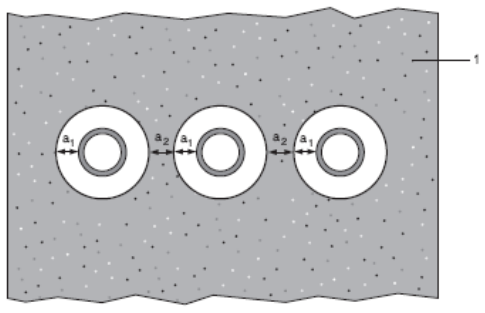
Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Walls Min. 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Solid wood/ cross-laminated Timber	100	Maximum 32 mm diameter/1.0-2.4 mm wall*	25	25mm Stone wool 33 kg/m^3	None	90	90
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							
Solid wood/ cross-laminated Timber	100	Maximum 32 mm diameter/2.0-3.0 mm wall*	25	25mm Stone wool 33 kg/m^3	None	90	90
PP pipe according to EN 1451-1 or DIN 8077/8078							
Solid wood/ cross-laminated Timber	100	Maximum 32 mm diameter/1.8-4.4 mm wall*	25	25mm Stone wool 33 kg/m^3	None	90	90
PEX pipe in pipe system							
Solid wood/ cross-laminated Timber	100	25 mm diameter outer /15 mm diameter x 2.5 mm wall inner#	25	25mm Stone wool 33 kg/m^3	None	90	90

All pipe classifications are pipe end configuration U/C, except for those marked "#" which are C/C (U=Uncapped, C=Capped).

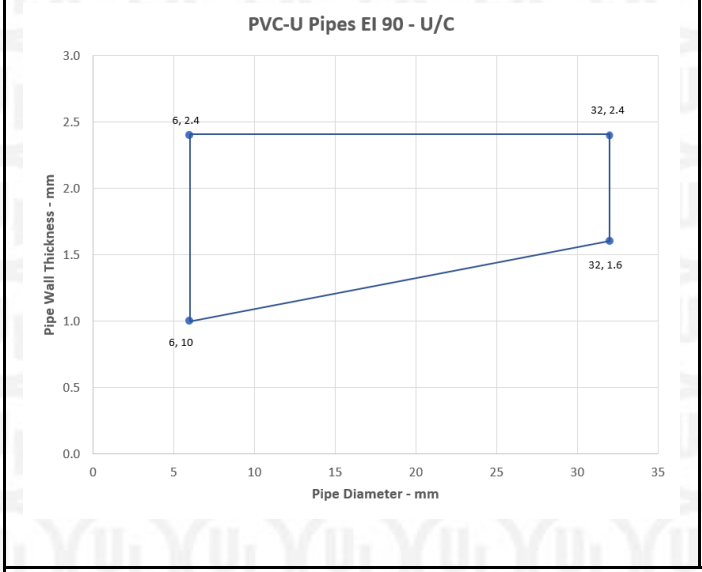
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

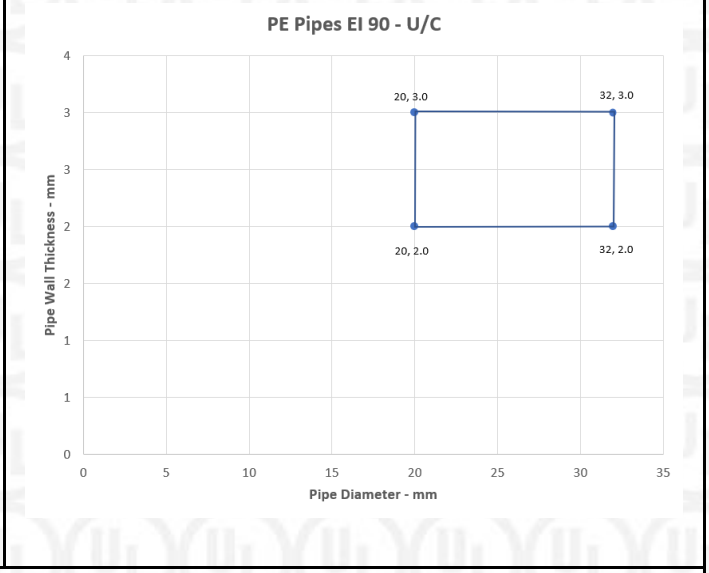
Configuration 1

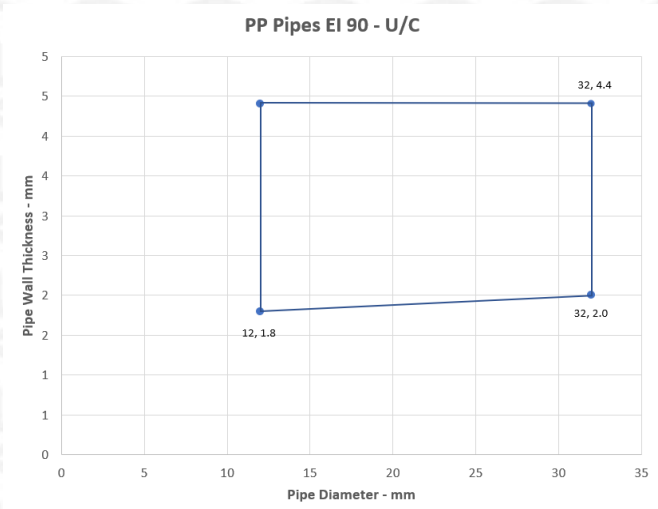


Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = Min. 10 mm & Max 30 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate







Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally*)**	**Sealant Depth (mm)**	**Backing Material**	**Aperture Ø (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	Single electrical cables up to 21 mm Ø	25	Protecta Mineral Fibre BIO 25 mm deep	82 Ø or max. 100 x 1000	120	60

* for circular seals or min. 30 mm from the edges of rectilinear apertures

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors Installed to top side of floor / 10 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material**	**Aperture (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	Blanks Seals	15	20 mm Stone wool 35 kg/m^3	300 x 300	90	60
			25	25 mm Stone wool 35 kg/m^3		120	120
				48 mm Mineral Fibre BIO		240	240
		Electric cables up to 21 mm diameter, single.				120	90
		23-27 mm diameter, 1 mm × 185 mm2 core, PVC sheath and insulation electrical cable, single				240	240

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors 25 mm deep Protecta FR Acrylic / 48 mm deep stone wool insulation 33 kg/m^3 backing - Maximum seal size 300 x 300 mm or 300 mm Ø							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Minimum Annular Space (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
Mild or stainless steel pipe							
Concrete	150	4 -16 mm diameter /1.0-8.0 mm wall#	25	48 mm stone wool	10	120	120
		17 -324 mm diameter /1.0-14.2 mm wall#				120	0
Copper or steel pipe							
Concrete	150	6 mm diameter /0.7-3.0 mm wall	25	48 mm stone wool	10	120	120
		6 -15 mm diameter /0.7-7.5 mm wall				120	60
		16 - 54 mm diameter /0.7-14.2mm wall				120	0
Copper or steel pipe with 80 kg/m^3 density stone wool insulation Continuous Sustained (CS)							
Concrete	150	12 mm diameter/0.9-6 mm wall, 20-80 mm insulation	25	48 mm stone wool	10	240	240
		13-54 mm diameter/0.9-14.2 mm wall, 20-80 mm insulation*				240	180
Alupex Pipe							
Concrete	150	16 -20 mm diameter/2.0 mm wall	25	48 mm stone wool	10	120	120
		21-75 mm diameter/2.0-4.6 mm wall				120	90
		16-75 mm diameter/2.25-4.6 mm wall with 20-50 mm thick glass wool or stone, mineral wool min. 75 kg/m^3 insulation Continuous Sustained (CS)				180	120

All pipe classifications are pipe end configuration C/C, except for those marked "#" which are C/U (C=Capped, C=Capped).

* Typical pipe diameters shown, intermediate sizes are possible.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors 25 mm deep Protecta FR Acrylic / 25 mm deep stone wool insulation 33 kg/m^3 backing - Maximum seal size 300 x 300 mm or 300 mm Ø							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Minimum Annular Space (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Concrete	150	Up to 50 mm Ø/1.6-3.7 mm wall	25	25 mm stone wool	10	240	240
		Up to 40 mm Ø/1.6-3.7 mm wall, with bundle of cables up to 21 mm diameter					
PP pipe according to EN 1451-1							
Concrete	150	12 mm Ø/1.2 mm wall	25	25 mm stone wool	10	240	240
		13-75 mm Ø/1.2-6.8 mm wall*				90	90
		Up to 40 mm Ø/1.2-1.8 mm wall, with bundle of cables up to 21 mm diameter				180	180
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							
Concrete	150	20-40 mm Ø/2.0-2.4 mm wall*	25	25 mm stone wool	10	240	240
		Up to 40 mm Ø/2.0-2.4 mm wall, with bundle of cables up to 21 mm diameter				180	180

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

* Typical pipe diameters shown, intermediate sizes are possible.

** seal fitted to both faces of the floor

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Floors Min. 7 mm seal width around service							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material**	**Aperture (mm)**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	Blank seals	15	25 mm Stone wool 35 kg/m^3	300 x 300	240	240
		Electric cables up to 21 mm diameter, single or in a bundle.				120	120
		Electric cables 22-50 mm diameter, single or in a bundle.				120	90
		Electric cables 51-80 mm diameter, single or in a bundle.				120	60

* seal fitted to both faces of the floor

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Copper or Steel Pipe**	**Max. Seal Size**	**Sealant / Backing Depth***	**Insulation LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	Up to 54 mm diameter/0.9-14.2 mm wall	10 mm width around pipe	15 mm / 20 mm	Min. 1000 mm of 20 mm Stone wool insulation 80 kg/m^3	240	180
		Up to 12 mm diameter/0.9-5 mm wall				240	240
		Up to 54 mm diameter/0.9-14.2 mm wall	Up to 100 x 1000 mm	25 mm / 20 mm		120	120
		Up to 54 mm diameter/0.9-14.2 mm wall	300 x 300 mm	15 mm / 20 mm		90	60
		Up to 12 mm diameter/0.9-5 mm wall					
		Up to 54 mm diameter/0.9-14.2 mm wall		25 mm / 20 mm		120	120

LI = Local Interrupted
CI = Continuous Interrupted

* backed with 40 kg/m^3 stone wool insulation or Protecta Mineral Fibre BIO.

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

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Max. Seal Size**	**Sealant/ Backing** Depth**	**Insulation min. 1000 mm LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	40 mm diameter/1-14.2 mm wall	10 mm width around pipe	15 mm / 20 mm	20 mm Stone wool insulation 80 kg/m^3	240	240
		40 mm diameter/1-14.2 mm wall			30 mm Stone wool insulation 80 kg/m^3	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*					
		40 mm diameter/1-14.2 mm wall	Up to 100 x 1000 mm	25 mm / 20 mm	20mm Stone wool 80 kg/m^3	120	90
		50 mm diameter/1.2-14.2 mm wall*			30 mm Stone wool 80 kg/m^3		
		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*					

LI = Local Interrupted
CI = Continuous Interrupted

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

* Typical pipe diameters, intermediate sizes are possible.
****** backed with 40 kg/m^3 stone wool insulation or Protecta Mineral Fibre BIO.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Max. Seal Size**	**Sealant / Backing** Depth**	**Insulation min 1000 mm LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	40 mm diameter/1-14.2 mm wall	300 x 300 mm	15 mm / 20 mm	20 mm Stone wool insulation 80 kg/m^3	90	60
		40 mm diameter/1-14.2 mm wall			30 mm Stone wool insulation 80 kg/m^3		
		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*					
		40 mm diameter/1-14.2 mm wall		25 mm / 20 mm	20mm Stone wool 80 kg/m^3	120	90
		50 mm diameter/1.2-14.2 mm wall*			30 mm Stone wool 80 kg/m^3		
		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*					

LI = Local Interrupted
CI = Continuous Interrupted

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

* Typical pipe diameters, intermediate sizes are possible.
**backed with 40 kg/m^3 stone wool insulation or Protecta Mineral Fibre BIO.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors
25 mm deep Protecta FR Acrylic / 48 mm deep Protecta Mineral Fibre BIO backing - Maximum seal size 300 x 300 mm or 504 mm Ø

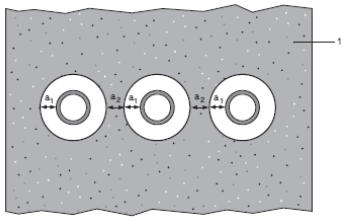
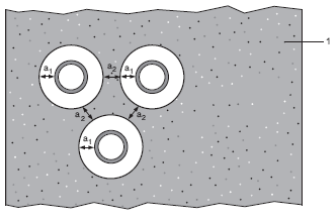
Substrate	Minimum Substrate Thickness (mm)	Services – Mild or Stainless Steel Pipe (fitted centrally)	Seal Width Around Pipe (a1)	Insulation CS	Fire Resistance (mins.)	
					E	EI
Masonry/ Concrete	150	40 mm diameter/1.0-14.2 mm wall*	10 mm	20 mm thick stone, mineral wool min. 80 kg/m3	240	240
		40 mm diameter/1.0-14.2 mm wall*		30-80 mm thick stone, mineral wool min. 80 kg/m^3		
		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)	Services – PEX pipe in pipe system (fitted centrally)	Seal Width Around Pipe (a1)	Insulation	Fire Resistance (mins.)	
					E	EI
Concrete	150	15 mm diameter x 2.5 mm wall inner /25mm diameter outer	10 mm	None	90	90

CS = Continuous Sustained

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

* Typical pipe diameters shown, intermediate sizes are possible.

Configuration 1	Configuration 2
	

Key

1 Supporting construction

a_1 Pipe / edge of seal separation (annular space) = 10 mm

a_2 Separation between penetration seals = 30 mm

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Single Sided Penetration Seals in Floors Maximum seal size 300 x 300 mm							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe (fitted centrally)**	**Sealant Depth (mm)**	**Backing**	**Insulation CI**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	16 mm diameter/2.25 mm wall	25	48 mm Protecta Mineral Fibre BIO	20 mm Stone wool 80 kg/m^3, 500 mm length from both sides of the seal	240	240
		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					

CI = Continuous Interrupted

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

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Floors								
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Max. Seal Size**	**Seal Depth (mm)**	**Backing**	**Insulation**	**Fire Resistance (mins.)**	
							E	**EI**
Concrete	150	Copper or steel pipe 54 mm diameter/2-14.2 mm wall	300 x 300 mm	25	25 mm deep 140 kg/m^3 Stone wool	None	120	20
		Mild steel pipe 16 mm diameter/1.5-7.5 mm wall					240	240
		Mild steel pipe maximum 63 mm diameter/1.5-14.2 mm wall		15	25 mm deep 35 kg/m^3 Stone wool		240	30
		Mild steel pipe 16 mm diameter/1.5-7.5 mm wall	Up to 100 x 1000 mm	25	25 mm deep Protecta Mineral Fibre BIO		120	120

* Seal to both faces of floor

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

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors 25 mm deep Protecta FR Acrylic							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Max. Seal Size**	**Backing**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	40 mm diameter/1-14.2 mm wall	300 x 300 mm	20 mm Stone wool 40 kg/m^3	13 -19 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	180	180
		40 mm diameter/1-14.2 mm wall*		25 mm Protecta Mineral Fibre BIO		60	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*					

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

* Typical pipe diameters, intermediate sizes are possible.

** seal to both faces of floor

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors 25 mm deep Protecta FR Acrylic							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Copper Pipe or Steel**	**Max. Seal Size**	**Backing**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	12 mm diameter/1-6 mm wall	300 x 300 mm	25 mm Protecta Mineral Fibre BIO	9 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	240	180
		12-54 mm diameter/1-14.2 mm wall*			9-13 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	180	120
		12-54 mm diameter/1-14.2 mm wall*			13-25 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	90	60
Substrate	**Minimum Substrate Thickness (mm)**	**Alupex Composite Pipe**	**Max. Seal Size**	**Backing**	**Insulation CS**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	16 mm diameter/2.25 mm wall	300 x 300 mm	25 mm Protecta Mineral Fibre BIO	9 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	180	180
		16 mm diameter/2.25 mm wall			9-13 mm Elastomeric insulation minimum class B-s3, d0 or phenolic foam insulation	120	60
		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 phenolic foam insulation	60	60
		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					

CS = Continuous Sustained
All pipe classifications are pipe end configuration C/C (C=Capped).
* Typical pipe diameters, intermediate sizes are possible.
** Seal to both faces of floor

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors 15 mm deep Protecta FR Acrylic							
Substrate	**Minimum Substrate Thickness (mm)**	**Services – Mild or Stainless Steel Pipe (fitted centrally)**	**Max. Seal Size**	**Backing**	**Insulation Min. 1000 mm LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
Concrete	150	40 mm diameter/1-14.2 mm wall	300 x 300 mm or 100 x 1000 mm	20 deep 40 kg/m^3 stone wool insulation	20 mm Stone wool 80 kg/m^3	240	240
		40 mm diameter/1-14.2 mm wall*			30 mm Stone wool 80 kg/m^3	240	120
		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*					

LI = Local Interrupted)
CI = Continuous Interrupted

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

* Typical pipe diameters, intermediate sizes are possible.

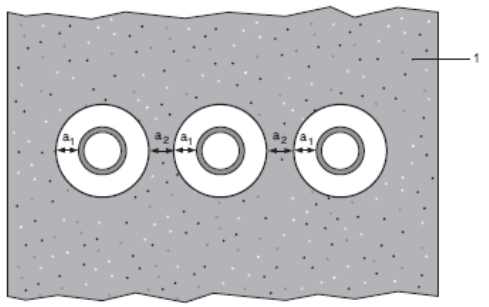
** seal to both faces of floor

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided* Penetration Seals in Floors with Protecta FR Service Coat FR-1. Min. 10 mm seal width around service Maximum seal size 220 mm Ø							
Substrate	**Minimum Substrate Thickness (mm)**	**Services (fitted centrally)**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum)**	**Fire Resistance (mins.)**	
						E	**EI**
Solid wood/ cross-laminated Timber	150	None (blank)	25	25 mm Stone wool 33 kg/m^3	None	120	120
		Cables up to 14 mm Ø, single or in bundles up to 100 mm Ø			Protecta Service Coat FR-1, 260-micron DFT extending 150 mm from top side of the seal		
		Cables up to 21 mm Ø, single or in bundles up to 100 mm Ø				120	90
		Cables up to 50 mm Ø, single or in bundles up to 100 mm Ø					
		Telecom cables up to 14 mm Ø, single or in bundles up to 100 mm Ø					

* seal applied to both sides of the floor

Configuration 1



Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = 10 mm
a2 Separation between penetration seals = 0 mm

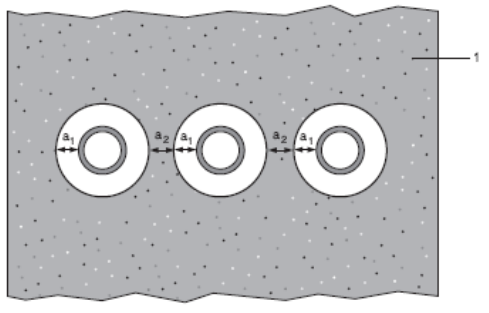
Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors Min. 10 mm seal width around service								
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Maximum Aperture**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
							E	**EI**
Mild or stainless steel pipe								
Solid wood/ cross-laminated Timber	150	Maximum 273 mm diameter /6.35-14.2 mm wall*	Ø 293 mm	25	25mm Stone wool 33 kg/m^3	25 mm glass wool or stone, mineral wool min. 75 kg/m^3, 500 mm length from both sides of the seal	120	60
Copper or steel Pipe								
Solid wood/ cross-laminated Timber	150	Maximum 15 mm diameter /0.7-7.5 mm wall*	Ø 220 mm	25	25mm Stone wool 33 kg/m^3	20 mm glass wool or stone, mineral wool min. 75 kg/m^3, 500 mm length from both sides of the seal	120	120
		Maximum 54 mm diameter /1.2-14.2 mm wall*					120	90
Alupex Pipe								
Solid wood/ cross-laminated Timber	150	Maximum 16 mm diameter/ 2.25 mm wall*	Ø 220 mm	25	25mm Stone wool 33 kg/m^3	20 mm glass wool or stone, mineral wool min. 75 kg/m3, 500 mm length from both sides of the seal	120	120
		Maximum 75 mm diameter/ 4.6 mm wall*				25 mm glass wool or stone, mineral wool min. 75 kg/m3, 500 mm length from both sides of the seal	120	90

All pipe classifications are pipe end configuration C/C (C=Capped).
LI = Local Interrupted
CI = Continuous Interrupted

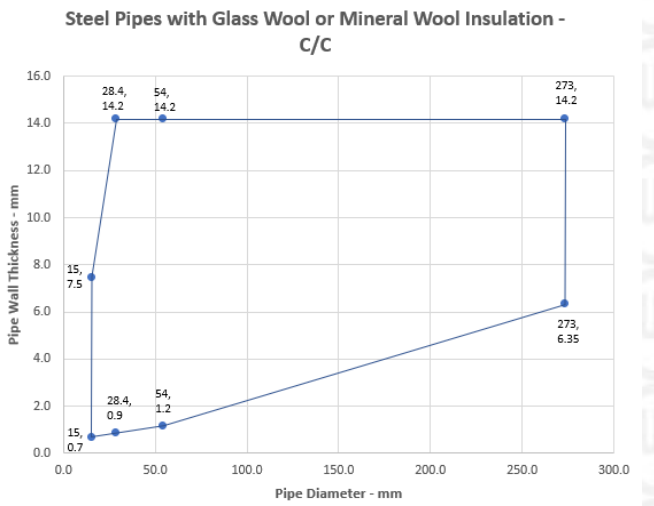
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

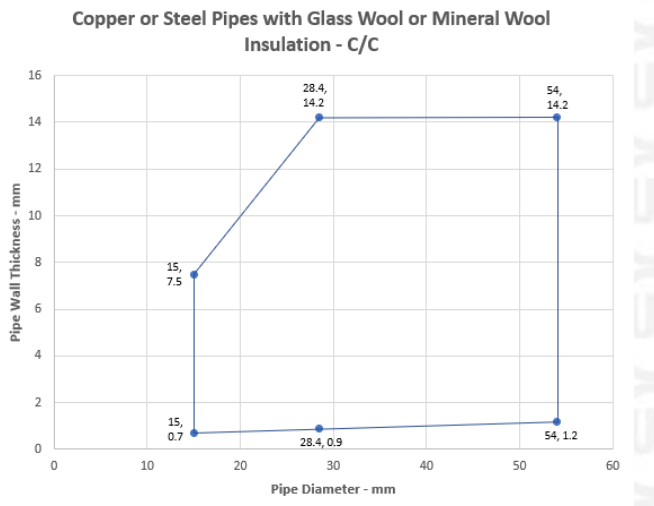
Configuration 1

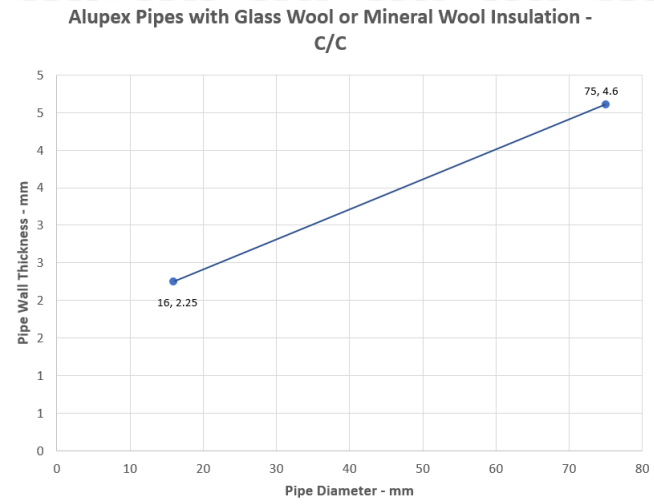


Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = 10 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate







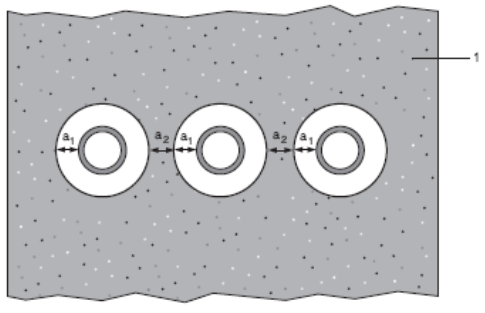
Appendix UL-EU Certificate

PROTECTA FR Acrylic: Double Sided** Penetration Seals in Floors 25 mm deep Protecta FR Acrylic							
Substrate	**Minimum Substrate Thickness (mm)**	**Services**	**Sealant Depth (mm)**	**Backing Material (Minimum)**	**Insulation (Minimum) LI or CI**	**Fire Resistance (mins.)**	
						E	**EI**
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1, PVC-C according to EN 1566-1							
Solid wood/ cross-laminated Timber	150	Maximum 32 mm diameter/1.0-2.4 mm wall*	25	25mm Stone wool 33 kg/m^3	None	120	120
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							
Solid wood/ cross-laminated Timber	150	Maximum 32 mm diameter/2.0-3.0 mm wall*	25	25mm Stone wool 33 kg/m^3	None	120	120
PP pipe according to EN 1451-1 or DIN 8077/8078							
Solid wood/ cross-laminated Timber	150	Maximum 32 mm diameter/1.8-4.4 mm wall*	25	25mm Stone wool 33 kg/m^3	None	120	120
PEX pipe in pipe system							
Solid wood/ cross-laminated Timber	150	25 mm diameter outer /15 mm diameter x 2.5 mm wall inner#	25	25mm Stone wool 33 kg/m^3	None	120	120

All pipe classifications are pipe end configuration U/C, except for those marked "#" which are C/C (U=Uncapped, C=Capped).

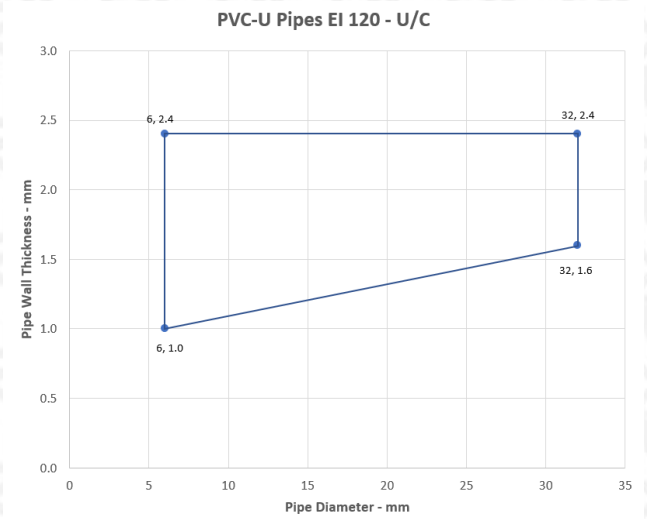
* Typical pipe diameters shown, intermediate sizes are possible.
** seal applied to both sides of the wall

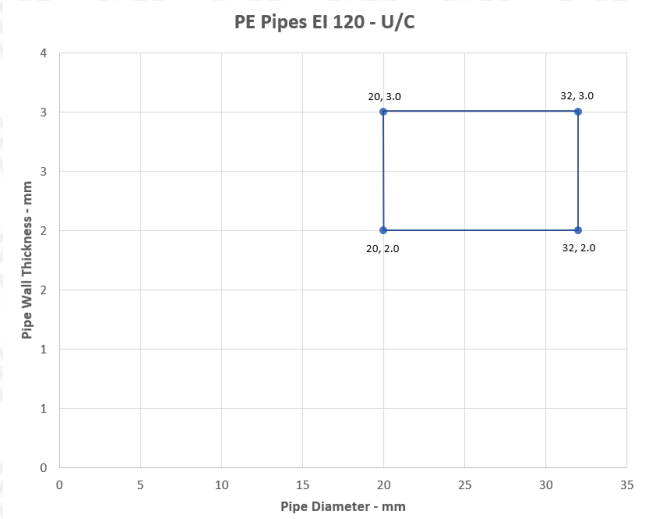
Configuration 1

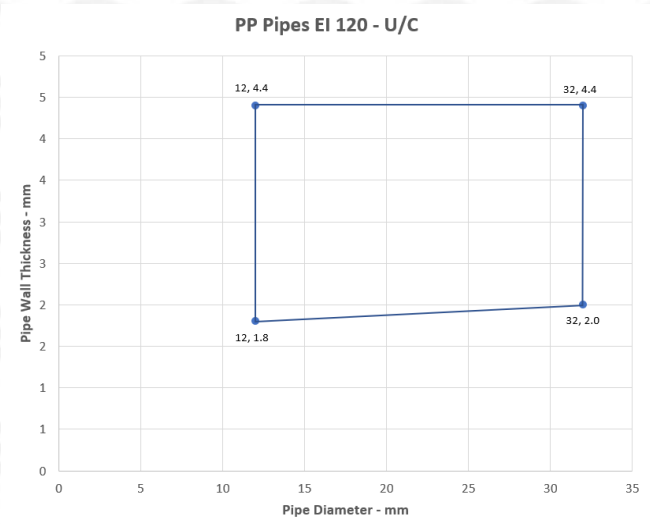


Key
1 Supporting construction
a1 Pipe/edge of seal separation (annular space) = Min. 10 mm & Max 30 mm
a2 Separation between penetration seals = 0 mm

Appendix UL-EU Certificate







Appendix UL-EU Certificate

PROTECTA FR Acrylic: Linear Gaps Head of Flexible Wall to Concrete Floor Soffit and Vertical End of Flexible Wall and Concrete Wall								
Substrates	**Minimum Substrate Thickness (mm)**	**Maximum Gap Size (mm)**	**Seal Position/ Orientation**	**Minimum Seal Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Fire Resistance (mins.)**	
							E	**EI**
Plasterboard & Concrete	100	30	Both Sides, Horizontal Joint	12.5	Stone wool 35 kg/m^3 plus 50 mm steel partition head track	12.5	120	120
			Both Sides, Vertical Joint		Stone wool 35 kg/m^3 *	20		
			Both Sides, Horizontal Joint	25	50 mm steel partition head track / stud	50		
		25	Both Sides, Horizontal Joint	12.5		50	90	90
		15	Both Sides, Vertical Joint					
	75	25	Both Sides, Horizontal Joint	12.5	50 mm steel partition head track / stud	50	60	45
		15	Both Sides, Vertical Joint					

* Maximum partition/wall height of 3 metres.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Vertically or Horizontally Orientated Linear Joints or Gap seals in Flexible or Rigid Walls

Substrates	Minimum Substrate Thickness (mm)	Maximum Gap Size (mm)	Seal Position/ Orientation	Minimum Seal Depth (mm)	Backing Material	Minimum Backing Depth (mm)	Facing Material (minimum)	Fire Resistance (mins.)	
								E	EI
Flexible or rigid wall / Timber	100	30	One Side, Vertical Joint	12.5	Stone wool 35 kg/m^3	12.5	Single sided linear seals in flexible or rigid walls against wooden frames covered with architraves on the other side fixed with 25 mm steel pins at nominal 300 mm centres.	60	60
			One Side, Horizontal Joint						
			Both Sides, Vertical Joint				None	90	60
			Both Sides, Horizontal Joint						
Steel / Steel			One Side, Vertical Joint					120	30
			One Side, Horizontal Joint						
Flexible or rigid wall / Steel			Both Sides, Vertical Joint					120[1]	30[2]
			Both Sides, Horizontal Joint					120[3]	45[4]

Single sided seals may be either side (or any position between) of the wall.

*Additional and for information only.

The classifications provided in the table above consider the insulation performance of all components within the firestopping system as per the requirements of EN 1366-4. This includes temperature evaluation of the steel substrate.

In relation to each of the above classifications, temperatures recorded on the seal (exclusive of the supporting construction) exceeded the maximum allowable after the following times (rounded down):
[1] 120, [2] 90, [3] 120, [4] 60

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Linear Gaps Head of Rigid Wall to Concrete Floor Soffit and Between Rigid Walls								
Substrates	**Minimum Substrate Thickness (mm)**	**Maximum Gap Size (mm)**	**Seal Position/ Orientation**	**Minimum Seal Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Fire Resistance (mins.)**	
							E	**EI**
Masonry/ Concrete	150	30	One Side, Horizontal Joint	25	Stone wool 40 kg/m^3	20	240	60
			Both Sides, Vertical or Horizontal Joint	15			240	240
			One Side, Horizontal Joint	25	Protecta Mineral Fibre BIO	48	240	120
		50	One Side, Vertical joint	10	Stone wool 33 kg/m3	60	120	120
			One Side, horizontal joint				240	60

Single sided seals may be either side (or any position between) of the wall.

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Linear Gaps Between Concrete Floor Slabs or Between Floor Slab and Rigid Wall								
Substrate	**Minimum Substrate Thickness (mm)**	**Maximum Gap Size (mm)**	**Seal Position**	**Minimum Seal Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Fire Resistance (mins.)**	
							E	**EI**
Masonry/ Concrete	150	100	Either face	25	Protecta Mineral Fibre BIO	25	120	60
			Top face				180	180
			Both sides	25	Stone wool 40 kg/m^3		120	120
				15	Stone wool 140 kg/m^3		180	180
		30	Both sides	15	Stone wool 35 kg/m^3		240	240
		100	Top face	10	Stone wool 33 kg/m3	90	240	240

Appendix UL-EU Certificate

PROTECTA FR Acrylic: Linear Joints or Gaps in or Between Concrete Floor Slabs								
Substrate	**Minimum Substrate Thickness (mm)**	**Maximum Gap Size (mm)**	**Seal Position**	**Minimum Seal Depth (mm)**	**Backing Material**	**Minimum Backing Depth (mm)**	**Fire Resistance (mins.)**	
							E	**EI**
Steel/ steel or Steel/ concrete	150	13	Top face	25	Stone wool 35 kg/m3	50	240[1]	30[2]
			Both sides	15		25	240[3]	45[4]
			Top face	25		50	180[5]	20[6]

*Additional and for information only.

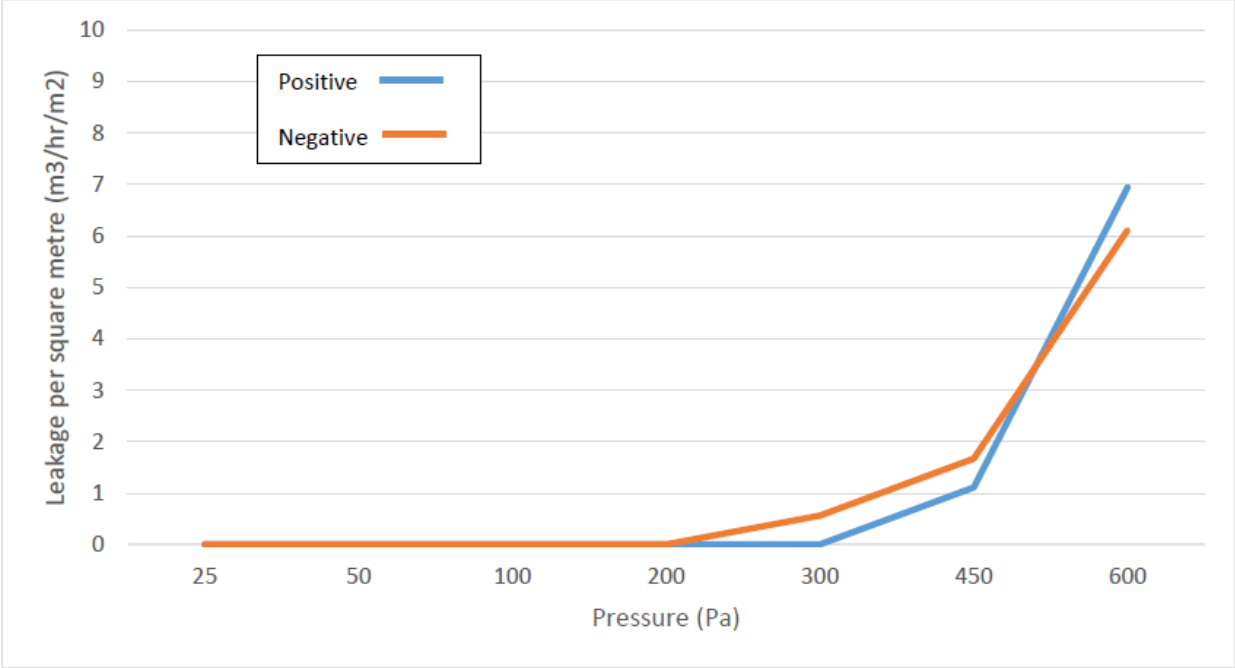
The classifications provided in the table above consider the insulation performance of all components within the firestopping system as per the requirements of EN 1366-4. This includes temperature evaluation of the steel substrate.

In relation to each of the above classifications, temperatures recorded on the seal (exclusive of the supporting construction) exceeded the maximum allowable after the following times (rounded down):

[1] 240, [2] 60, [3] 240, [4] 120, [5] 180, [6] 60

Appendix UL-EU Certificate

Product tested	10mm deep x 30mm wide Protecta FR Acrylic		
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	0.02	0.56
	450	0.06	1.67
	600	0.22	6.11
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	0.04	1.11
	600	0.25	6.94



Appendix UL-EU Certificate

Certification Mark	**UL-EU mark**
Certificate No.	UL-EU-00912-CPR
Page	60/60
Date of Issue	2015-10-09

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.

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