

UL-EU CERTIFICATE

Certificate No.
UL-EU-00770-EN

Issue date
20-04-2015

Issue No.
5

Re-Issue date
18-06-2024

Expiry date
17-06-2034



4705

Certificate Holder:
FSi Limited

Address:
Westminster Industrial Estate
Tamworth Road
Measham
DE12 7DS
United Kingdom

Product:
PYROPRO HPE Sealant

Places of production:
As above & S/001

Standard:
EAD 350454-00-1104, September 2017/ EAD 350141-00-1106,
September 2017 / EN 13501-2

Authorised Signatory:

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

Chris Johnson

Issued by UL International (UK) Ltd

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shall remain valid through the Expiration date, unless a Standard identified on this Certificate is amended or withdrawn prior to that date or there is a non-compliance with the Agreement.



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This certificate relates to the use of PYROPRO HPE Sealant for fire stopping where services penetrate floors and walls or there are joints in or between walls & floors. The detailed scope is given in pages 3 to 46 of this Certificate. This shows the thickness and acceptable dimensions, substrates and orientations required to provide fire resistance periods of up to 240 minutes (EI 240).

The product is certificated on the basis of:

- i) ETA 20/1011
- ii) EC – CERTIFICATE OF CONSTANCY OF PERFORMANCE 2531 – CPR – CX010253
- iii) Inspection and surveillance of factory production control by UL
- iv) Fire resistance test data in accordance with EN 1366-3: 2009 and 1366-4: 2006.
- v) Classification in accordance with EN 13501-2
- vi) Durability and Servicability as defined in EAD 350454-00-1104 and EAD 350141-00-1106

The durability class of PYROPRO HPE is Z₁ - intended for use at internal conditions with high humidity, excluding temperatures below 0°C



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Product-type: Sealant		Intended use: Penetration Seal / Linear Joint & Gap Seal	
Assessment method	Essential characteristic	Product Performance	
BWR 2 Safety in case of fire			
EN 13501-1	Reaction to fire	Class F	
EN 13501-2	Resistance to fire	See pages 5 - 46	
BWR 3 Hygiene, health and environment			
Declaration of manufacturer & EN 16516	Content, emission and/or release of dangerous substances	Declaration of manufacturer	
EN 1026:2000	Air permeability (material property)	See page 4	
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 ₁	
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	R _w (C;C _{tr})= 52(-1;-6)	
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	



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Pyropro HPE Sealant: Air Permeability according to BS EN 1026				
Pressure (Pa)	Results under positive chamber pressure		Results under negative chamber pressure	
	Leakage (m ³ /h)	Leakage (m ³ /m ² / h)	Leakage (m ³ /h)	Leakage (m ³ /m ² / h)
50	0.2	5.6	0.3	8.3
100	0.4	11.1	0.6	16.7
150	0.7	19.4	0.9	25.0
200	1.0	27.8	1.2	33.3
250	1.1	30.6	1.6	44.4
300	1.2	33.3	1.9	52.8
450	2.2	61.1	2.7	75.0
600	2.4	66.7	3.4	94.4



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Penetration Seals

Flexible or Rigid Walls Minimum Thickness 100 mm

Plastic pipes

Flexible or Rigid Walls ≥ 100 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible wall
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
PVC pipe 40 – 125 mm \varnothing , 1.9 – 9.2 mm wall thickness*	25 (with 10 mm fillet protruding wall)	20	N/A	EI 45 C/U, U/C, C/C
PVC pipe 40 mm \varnothing , 1.9 mm wall thickness				EI 120 - C/U, U/C, C/C
ABS pipe 40 mm \varnothing , 1.9 mm wall thickness				EI 120 - C/U, U/C, C/C
PP pipe 40 mm \varnothing , 2 mm wall thickness				EI 120 - C/U, U/C, C/C

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

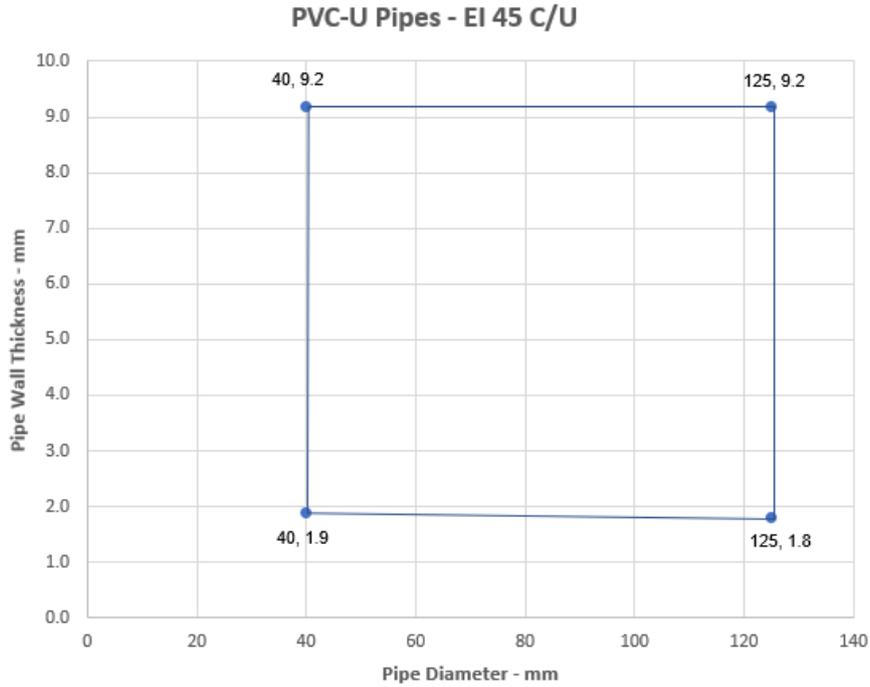
All services supported with 'Unistrut' pipe supports at 260 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 100 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible wall
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Blazemaster CPVC Sprinkler Pipe 27 – 89 mm \varnothing , 2.5 – 7.2 mm wall thickness	25	20	N/A	EI 120 – U/U, C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.



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Flexible or Rigid Walls ≥100 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Stopseal Batt 4. Flexible Wall
Penetration Service	Pyropro HPE		Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Lubrizol CPVC Sprinkler Pipe 20 – 80 mm Ø, 2.5 – 7.9 mm wall thickness	20	25	1200 x 730	EI 90 – C/U, U/C, C/C
			2600 x 2600	EI 60 – C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 100 mm Insulated or uninsulated				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Stopseal Batt 4. Flexible Wall 	
Penetration Service	Pyropro HPE		Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Blazemaster CPVC Sprinkler Pipe 27 – 89 mm \varnothing , 2.5 – 7.0 mm wall thickness	20	25	1200 x 750	EI 120 – U/C, C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.



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Cables

Metallic Pipes

Insulated metallic pipes

Flexible or Rigid Walls ≥ 100 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Insulated metal pipe 3. Flexible wall
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper 159 mm \varnothing , 2 -14.2 mm wall thickness with ≥ 30 mm thick $\geq 80\text{kg/m}^3$ foil faced glass wool (LS*, CS**)	25 (with 10 mm fillet protruding wall)	20	N/A	E 120, EI 30 – C/U, C/C
Copper 40 – 159 mm \varnothing , 2 -14.2 mm wall thickness with 32 mm thick 96kg/m^3 Armaflex pipe insulation (LS*, CS**)				

* Continuous through seal and extending minimum 650 mm from both faces of the seal (LS)

** Continuous through seal and full length of the pipe (CS)

All services supported with 'Unistrut' pipe supports at 260 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 100 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Insulated metal pipe 3. Stopseal Batt 4. Flexible wall 	
Penetration Service	Pyropro HPE		Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 40 mm \varnothing 1.5 mm – 14.2 mm wall thickness, insulated with ≥ 20 mm thick foil faced glass wool insulation $\geq 80\text{kg/m}^3$ (CS) Continued Sustained	15	15	2600 x 2600	EI 60 - C/C
Copper/Steel pipe 40mm – 159mm \varnothing 1.5mm – 14.2 mm wall thickness*, insulated with ≥ 30 mm thick foil faced glass wool insulation $\geq 80\text{kg/m}^3$ (CS) Continued Sustained	15	15	1200 x 730	EI 60 - C/C

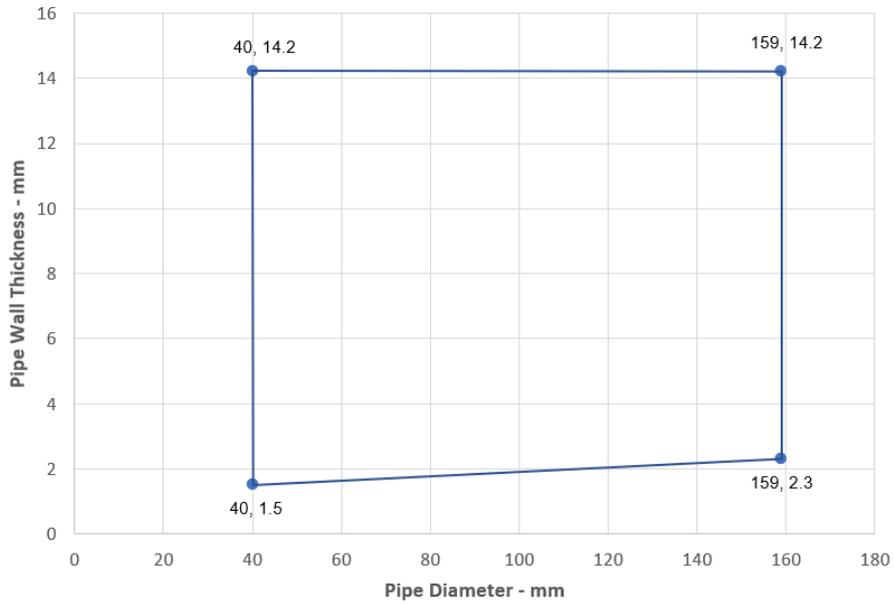
*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with pipe and cable supports at 250 mm from both faces of the wall.



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Copper or Steel Pipes with Glass Wool Insulation EI 60 C/C



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Flexible or Rigid Walls ≥ 100 mm Insulated or uninsulated						
					<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Insulated metal pipe 3. Stopseal Batt 4. Flexible wall 	
Penetration Service	Pyropro HPE		50 mm Stopseal Batt Maximum Aperture Size (mm)	Separating Distance		Classification
	Annular Space (mm)	Min. Depth (mm)		Between Services	Aperture Edge	
6x $\varnothing 22$ mm, 0.9 mm -14.2 wall thickness Copper pipes with 20 mm thick Kooltherm FM insulation (LS*, CS**)	0mm above and below service, 20 mm on each side of service	full depth	Double layer 2600 mm x 2600 mm	≥ 0 mm	≥ 0 mm	EI 30 - C/U, C/C
6x $\varnothing 22$ mm, 0.9-14.2 mm wall thickness Copper pipes with 19 mm thick Armaflex Class 'O' insulation (LS*, CS**)						E 90, EI 60 - C/U, C/C

* Continuous through seal and extending minimum 450 mm from both faces of the seal (LS)

** Continuous through seal and full length of the pipe (CS)

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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Flexible or Rigid Walls Minimum Thickness 120 mm

Plastic pipes

Flexible or Rigid Walls ≥ 120 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible Wall
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
PVC pipe 40 – 125 mm \varnothing , 1.9 – 7.4 mm wall thickness*	25	16	≥ 30 mm deep $\geq 80\text{kg/m}^3$ Stone wool	EI 120 - U/C, C/C

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

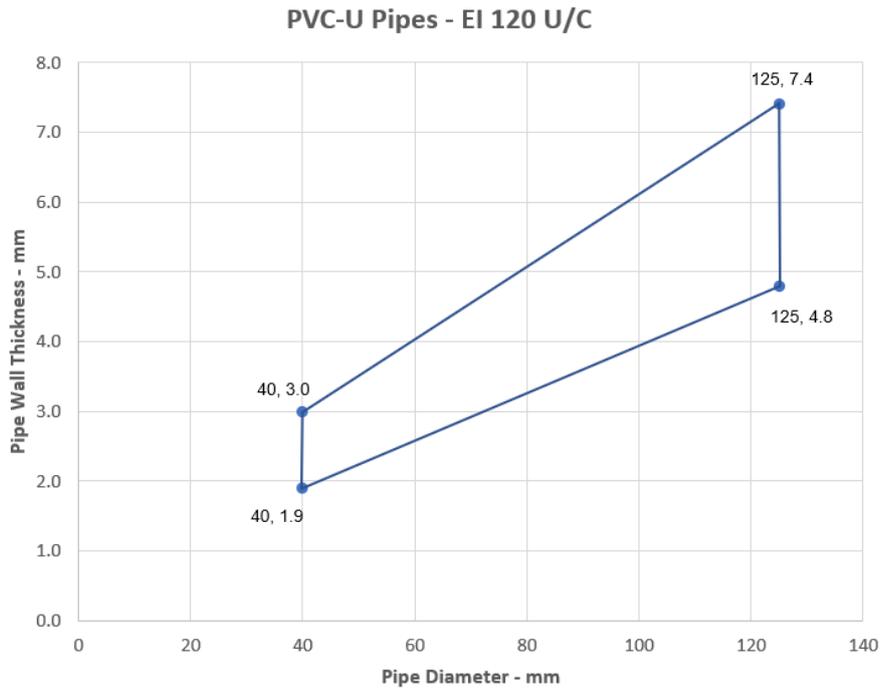
All services supported with 'Unistrut' pipe supports at 150 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 120 mm					
					Key 1. Pyropro HPE 2. Plastic pipe 3. Flexible Wall
Penetration Service	Depth (mm)	Maximum Aperture Size (mm)	Annular Space (mm)	Backing Material	Classification
HDPE pipe 63 mm \varnothing 7.2 mm wall thickness	25	300 x 100	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe supports at 150 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 120 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible Wall 	
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
HDPE pipe 90 mm \varnothing 9.2 mm wall thickness	25	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.



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Flexible or Rigid Walls ≥ 120 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible Wall 	
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
ABS pipe 90 mm \varnothing 6.0 mm wall thickness	25	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.



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Insulated metallic pipes

Flexible or Rigid Walls ≥ 120 mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Flexible Wall 4. Armaflex Insulation
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper/Steel pipe 60 mm \varnothing 0.8 mm – 14.2 mm wall thickness, insulated with 32 mm 'Armaflex' Continued Sustained (CS)	25	20	n/a	E 120, E I90 - C/U, C/C
Copper/Steel pipe 15 mm \varnothing 0.8 mm – 7 mm wall thickness, insulated with 13 mm 'Armaflex' Continued Sustained (CS)	25	12	n/a	EI 120 - C/U, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.



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Rigid Walls Minimum Thickness 150 mm

Plastic pipes

Rigid Walls ≥ 150 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Stopseal Batt 4. Rigid wall
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm \varnothing 2.6 wall thickness	20	25 - both sides of wall	1100 x 750	EI 45 - U/C, C/C
PVC Pipe 50 mm \varnothing 2.6 – 3.7 wall thickness	20	25 - both sides of wall	1100 x 750	E 45, EI 30 - U/C, C/C
PVC Pipe 50 mm – 125 mm \varnothing 2.6 – 7.4 wall thickness*	20	25 - both sides of wall	1100 x 750	EI 30 - U/C, C/C

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

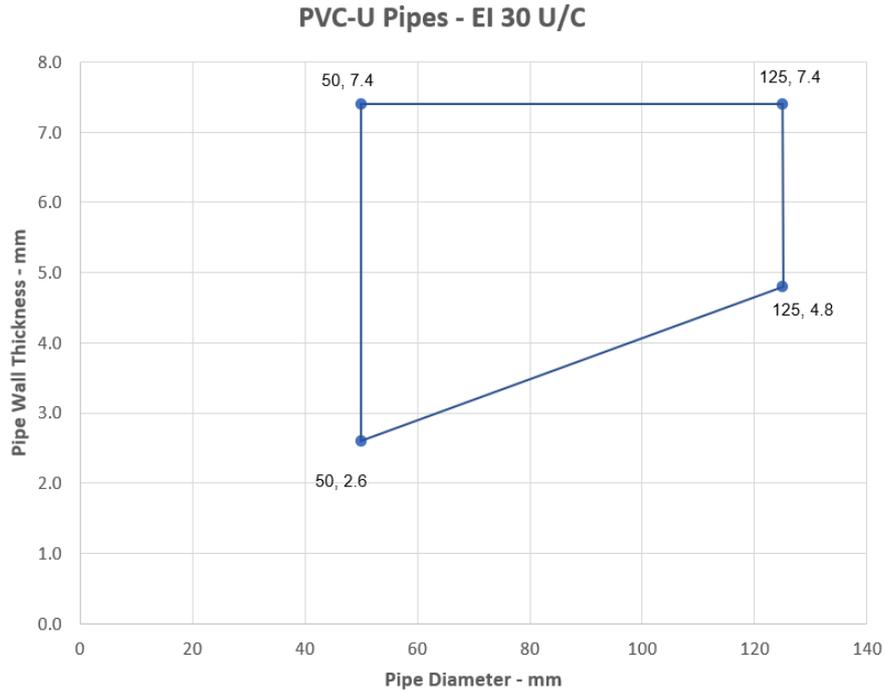
All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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Rigid Walls ≥ 150 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Stopseal Batt 4. Rigid wall
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm \varnothing 2.6 – 7.4 mm wall thickness*	20	25 - both sides of wall	1200 x 730	EI 120 - U/C, C/C
PVC Pipe 125 mm \varnothing 7.4 mm wall thickness				
PVC Pipe 50 mm – 125 mm \varnothing 2.6 – 7.4 mm wall thickness*				E 120, EI 90 - U/C, C/C
PVC Pipe 50 mm \varnothing 2.6 – 7.4 mm wall thickness	20	25 - both sides of wall	2600 x 2600	EI 60 - U/C, C/C
PVC Pipe 125 mm \varnothing 7.4 mm wall thickness				
PVC Pipe 50 mm – 125 mm \varnothing 2.6 – 7.4 mm wall thickness*				

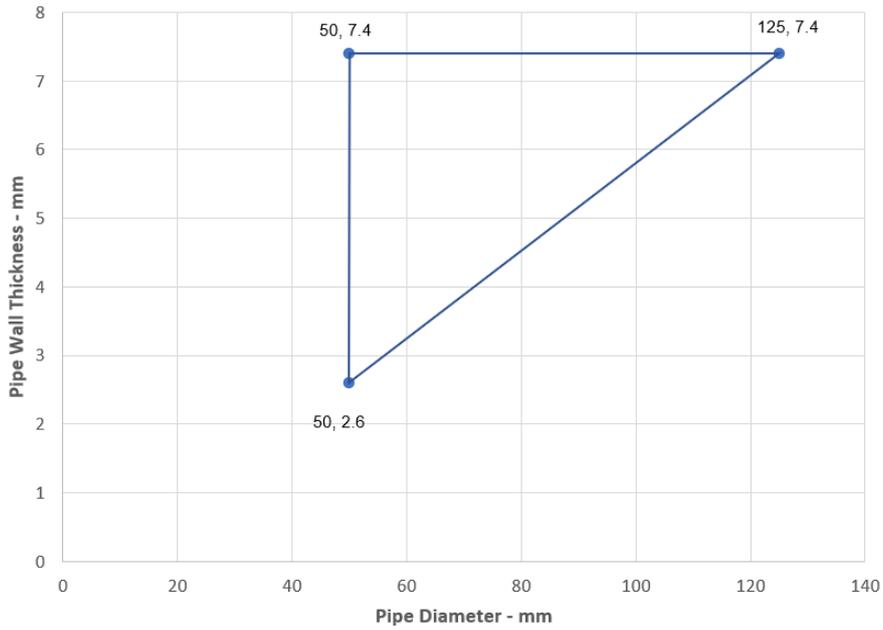
*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

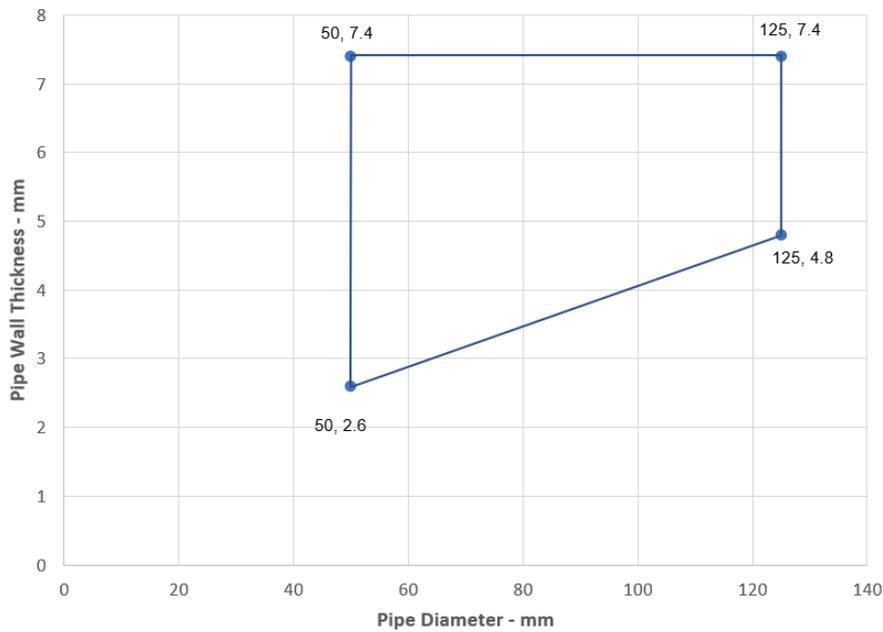


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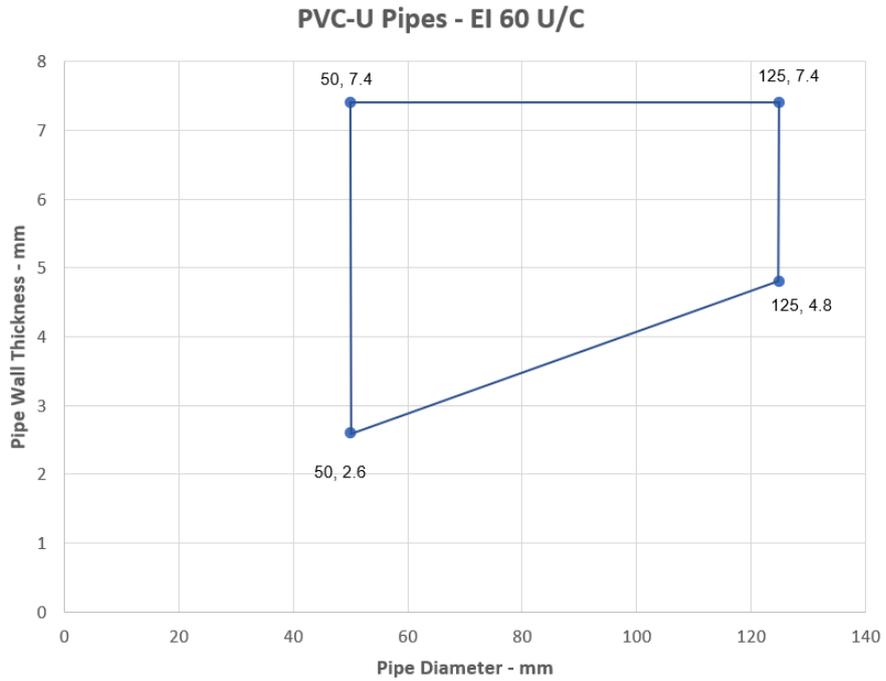
PVC-U Pipes - EI 120 U/C



PVC-U Pipes - E 120, EI 90 U/C



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Multi layered pipes

Rigid Walls ≥ 150 mm				Key
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm \varnothing 4 mm – 10 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 45, EI30 - C/U, U/C & C/C

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

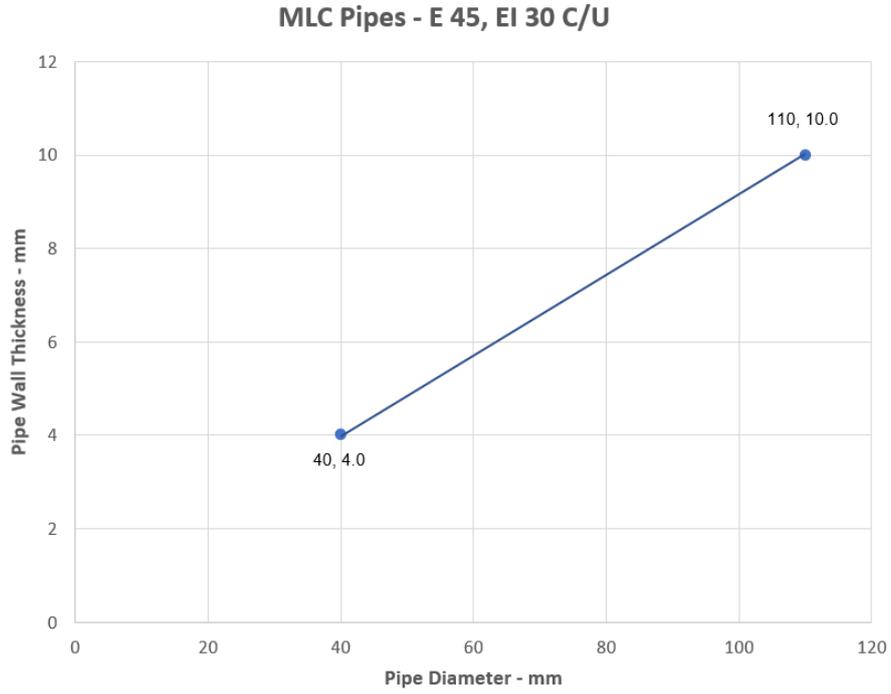
All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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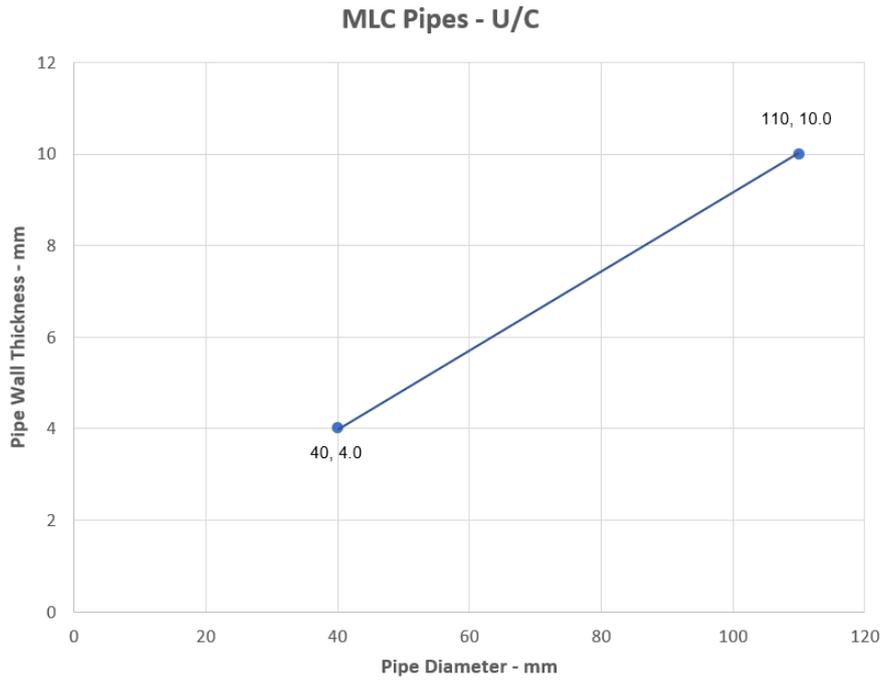
Rigid Walls ≥ 150 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Plastic pipe 3. Stopseal Batt 4. Rigid wall 	
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm \varnothing 4 mm – 10 mm wall thickness*	20	25 - both sides of wall	1200 x 730	EI 120 – U/C, C/C
			2600 x 2600	EI 60 - U/C, C/C

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

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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Cables

Rigid Walls ≥ 150 mm					
					<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Backing material 3. Cables 4. Rigid wall
Penetration Service	Depth (mm)	Maximum Aperture Size (mm)	Backing Material	Minimum Distance to Edge of Aperture (mm)	Classification
Telecomms. Cable bunch ≤ 100 mm \varnothing	25	180 x 180	Stone wool or ceramic wool (20mm 45kg/m ³)	10	EI 240
PVC conduits ≤ 16 mm \varnothing					E 240, EI 45
Steel/Copper conduits ≤ 16 mm \varnothing					E 240, EI 90
Cables ≤ 21 mm \varnothing					E 180, EI 45
Cables ≤ 50 mm \varnothing					E 180, EI 45
Cables ≤ 80 mm \varnothing					E 180, EI 45

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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Rigid Walls ≥ 150 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. 500mm perforated cable tray 3. Stopseal Batt 4. Rigid wall 	
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of wall	1100 x 750	EI 30
*Electrical cables up to 21 mm \varnothing				
Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables				

*All cables coated with 2mm DFT PST Coating 300mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from both faces of the wall.



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Rigid Walls ≥150 mm				
			<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. 500mm perforated cable tray 3. Stopseal Batt 4. Rigid wall 	
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of wall	1200 x 730	EI 120
*Electrical cables up to 21 mm Ø				E 120, EI 90
*Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables				
*500 mm perforated cable tray			2600 x 2600	EI 60
*Electrical cables up to 21 mm Ø				
*Electrical cables up to 50 mm Ø				

*All cables coated with 2mm DFT PST Coating 300mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from both faces of the wall.



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Metallic pipes

Rigid Walls ≥ 150 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Metal pipe 3. Stopseal Batt 4. Rigid wall
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 40 mm – 159mm \varnothing 1.2mm – 14.2 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 45, EI 20 – C/U, C/C
Copper/Steel pipe 40 mm \varnothing 1.2mm – 14.2 mm wall thickness				EI 45 - C/U, C/C

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

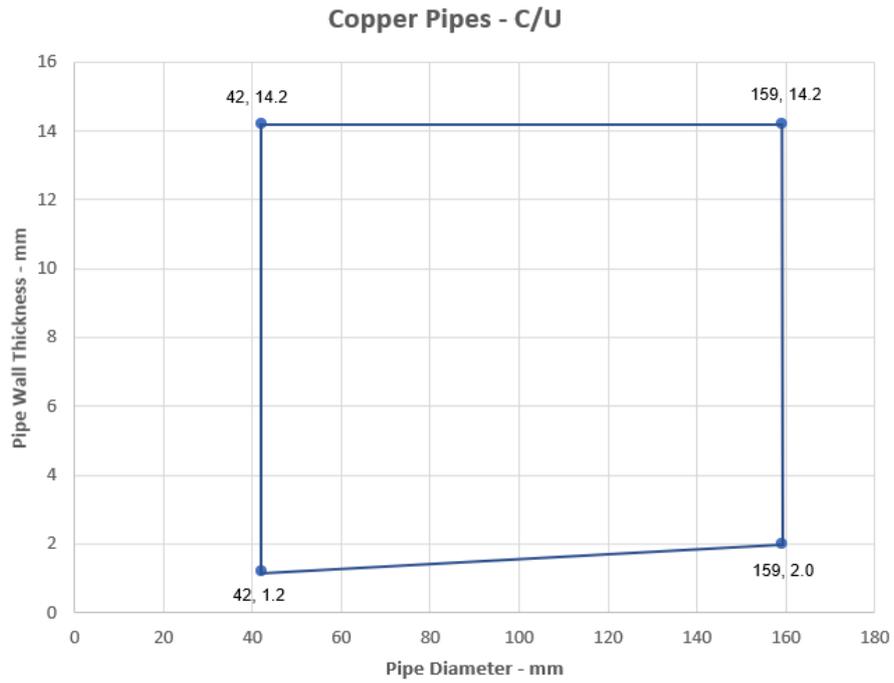
All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



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Rigid Walls ≥ 150 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Metal pipe 3. Stopseal Batt 4. Rigid wall
Penetration Service	Pyropro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 42 mm – 159mm Ø 1.2mm – 14.2 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 120, EI 30 – C/U, C/C
Copper/Steel pipe 42 mm Ø 1.2 mm – 14.2 mm wall thickness				E 120, EI 60 – C/U, C/C
Copper/Steel pipe 42 mm – 159 mm Ø 1.2 mm – 14.2 mm wall thickness			2600 x 2600	EI 60 – C/U, C/C

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

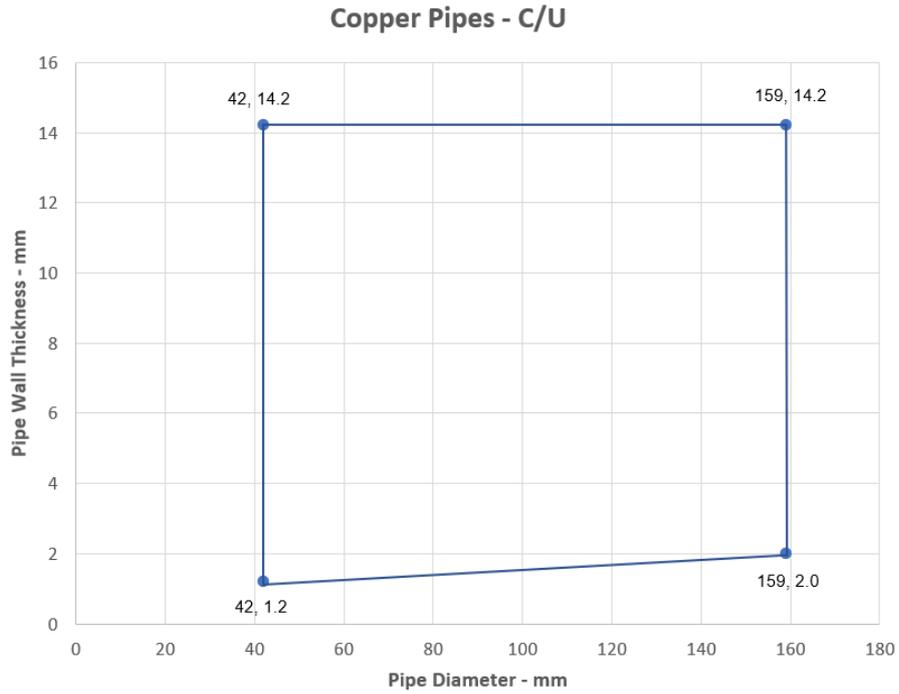
All services supported with pipe and cable supports at 400 mm from both faces of the wall.



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Rigid Floors Minimum Thickness 150 mm

Plastic pipes

Flexible Floor ≥150mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Backing material 3. Plastic pipe 4. Rigid floor
Penetration Service	Pyropro HPE Depth (mm)	Annular Space (mm)	Backing Material	Classification
PP Pipe 110 mm Ø 3.7 mm wall thickness	≥25 (both sides of floor)	20mm	≥100mm ≥45 kg/m ³ stone wool	EI 30 - U/C, C/C
PP Pipe 110 mm Ø 10.7 mm wall thickness				EI 120 - U/C, C/C
PP Pipe 50 mm Ø 2.1 mm wall thickness				EI 240 - U/C, C/C
PP Pipe 50 – 110 mm Ø 2.1 – 10.7 mm wall thickness*				EI 30 - U/C, C/C
PVC Pipe 40 mm Ø 2 mm wall thickness				EI 240 - U/C, C/C
PVC Pipe 114 mm Ø 3.6 mm wall thickness				E 90, EI 45 - U/C, C/C
PVC Pipe 114 mm Ø 8.1 mm wall thickness				E 120, EI 30 - U/C, C/C
PVC Pipe 40 – 114 mm Ø 2 – 8.1 mm wall thickness*				E 90, EI 30 - U/C, C/C



Solutions

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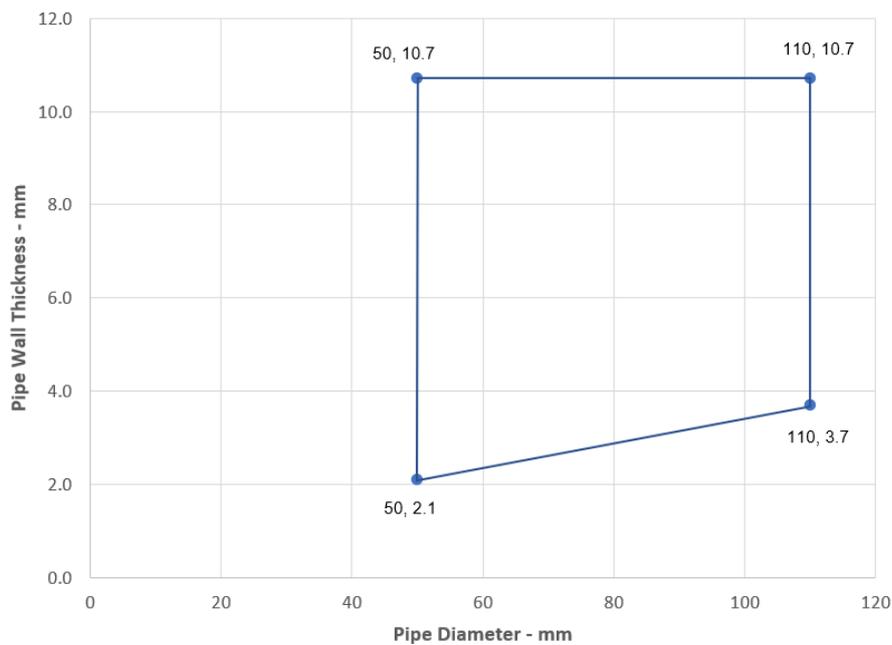
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Penetration Service	Pyropro HPE Depth (mm)	Annular Space (mm)	Backing Material	Classification
PE Pipe 40 mm Ø 4.1 mm wall thickness	≥25 (both sides of floor)	15	≥100mm ≥45 kg/m ³ stone wool	EI 240 - U/C, C/C
PE Pipe 125 mm Ø 7.6 mm wall thickness				EI 60 - U/C, C/C
PE Pipe 125 mm Ø 11.4 mm wall thickness				EI 90 - U/C, C/C
PE Pipe 40 – 125 mm Ø 4.1 – 11.4 mm wall thickness*				EI 60 - U/C, C/C

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

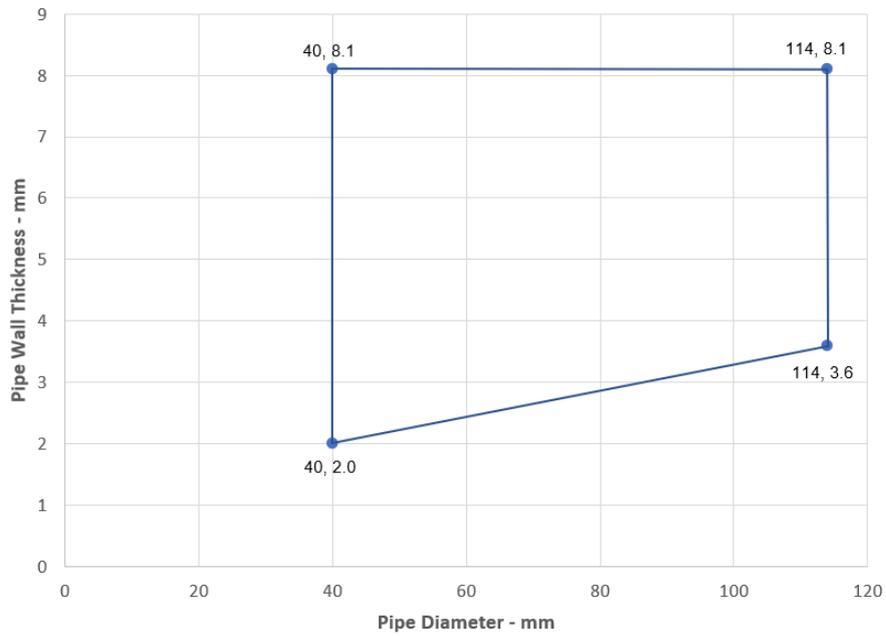
All services supported with pipe and cable supports at 250 mm from upper face of the floor.

PP Pipes - EI 30 U/C

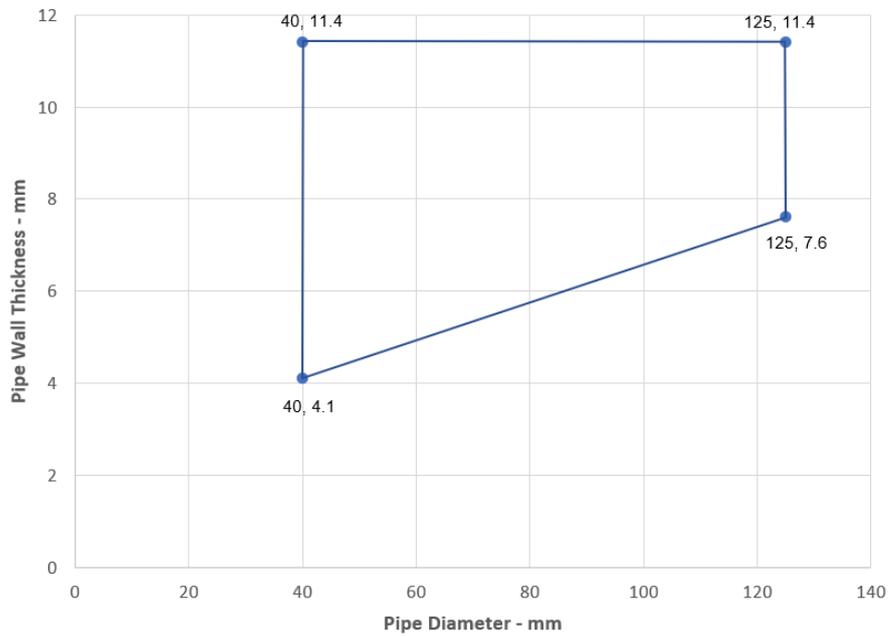


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PVC Pipes - E 90, EI 45 U/C



PE Pipes - EI 60 U/C



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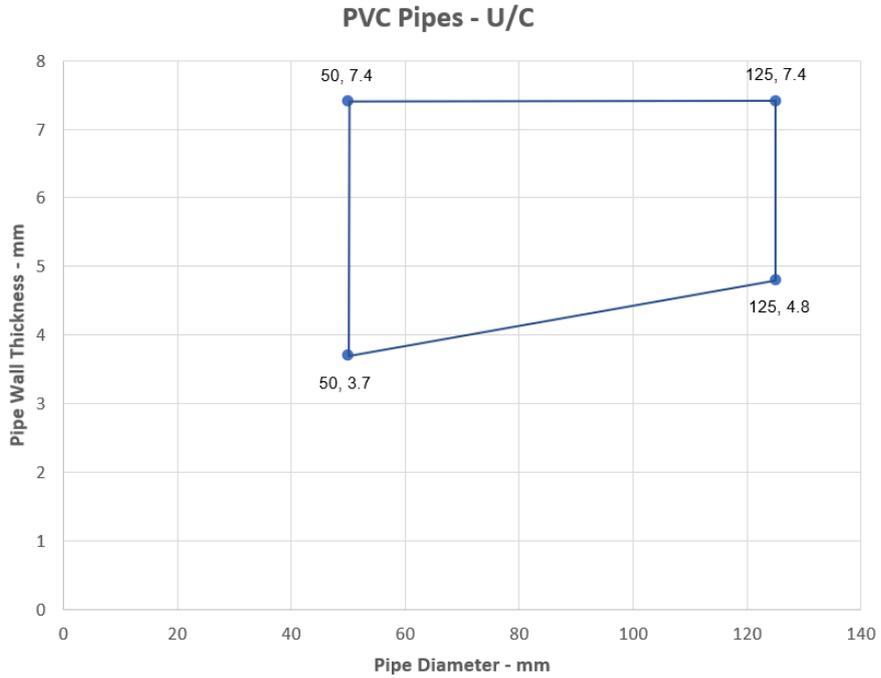
Rigid Floor ≥150 mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Stopseal Batt 3. Plastic pipe 4. Rigid floor
Penetration Service	Pyropro HPE		50mm Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm – 125 mm Ø 2.6 – 7.4 mm wall thickness*	20	25 - both sides of floor	Double layer 1500 x 1000	EI 60 - U/C, C/C

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

All services supported with pipe and cable supports at 400 mm from upper face of the floor.



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Multi layered pipes

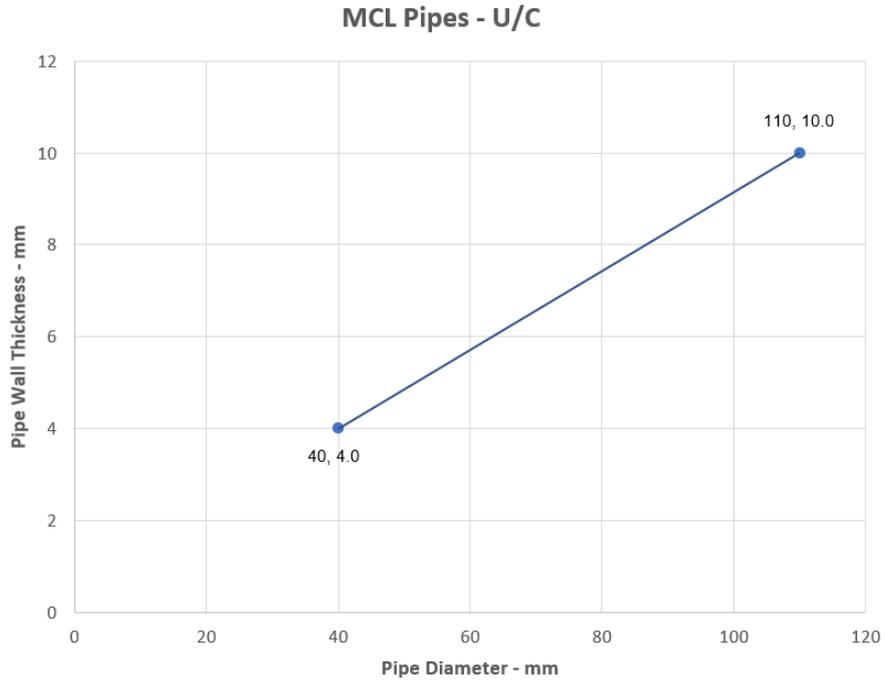
Rigid Floor ≥ 150 mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Stopseal Batt 3. MLC pipe 4. Rigid floor
Penetration Service	Pyropro HPE		50mm Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm \varnothing 4 mm – 10 mm wall thickness	20	25 - both sides of floor	Double layer 1500 x 1000	EI 60 - U/C, C/C

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

All services supported with pipe and cable supports at 400 mm from upper face of the floor.



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Cables

Rigid Floor ≥ 150 mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Backing material 3. Cables 4. Rigid floor
Penetration Service	Pyropro HPE Min. Depth (mm)	Aperture Size (mm)	50mm Stopseal Batt Maximum Aperture Size (mm)	Classification
Electrical Cables ≤ 21 mm \varnothing	≥ 25 (installed upper face only)	Max 200 x 200 Min 50 x 50	≥ 100 mm ≥ 45 kg/m ³ stone wool	E 180, EI 30
Electrical Cables ≤ 80 mm \varnothing				E 120, EI 20
Non sheathed electrical cables 0-24 mm \varnothing				E 180, EI 20

All services supported with pipe and cable supports at 400 mm from upper face of the floor.



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Rigid Floor ≥150 mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. 500mm perforated cable tray 3. Stopseal Batt 4. Rigid wall
Penetration Service	Pyropro HPE		50mm Stopseal Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of floor	Double layer 1500mm x 1000	EI 60
*Electrical cables up to 21 mm Ø				
*Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables				

*All cables coated with 2 mm DFT PST Coating 300 mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from upper face of the floor.



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Insulated metal pipes

Rigid Floor ≥ 150 mm				
				<p>Key</p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Backing material 3. Copper/Steel pipe 4. Rigid floor
Penetration Service	Pyropro HPE Min. Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper/Steel pipe 41-159 mm \varnothing 2.5 mm - 14.2 mm wall thickness, insulated with 13 mm – 32 mm 'Armaflex' (CS) Continued Sustained	≥ 25 (installed upper face only)	20mm	≥ 100 mm ≥ 45 kg/m ³ stone wool	EI 20 - U/C, C/U & C/C
Copper/Steel pipe 41 mm \varnothing 1.4 mm - 14.2 mm wall thickness, insulated with 13 mm 'Armaflex' (CS) Continued	≥ 25 (both sides of floor)			E 240, EI 60 - U/C, C/U, C/C

All services supported with pipe and cable supports at 250 mm from upper face of the floor.



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Linear Joints

Flexible or Rigid Walls Minimum Thickness 120mm

Flexible or Rigid Walls ≥ 120 mm			
		<p><u>Key</u></p> <ol style="list-style-type: none"> 1. Pyropro HPE 2. Backing Material 3. Flexible Wall 4. Rigid wall 	
Substrate	Depth (mm)	Backing Material	Classification
Flexible wall to rigid wall	25mm (both sides)	PE backing rod	EI 120 – V – X – F – W 00 to 20



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