

# Technical Data Sheet

## Pyropro HPE Sealant

### UIC of product-type: HPE

Issue: 5.1  
Jan 2018



CE Certification  
Air Permeability  
Movement Rigid Walls  
Pipes Linear joints  
Acoustic Rating  
Trays Rigid Floors  
CE Certification  
Air Permeability



CE Certification  
Penetration Seals  
Movement Rigid Walls  
Metallic Pipes Linear  
Flexible Walls Acoustic  
Cable Trays Rigid Floors  
Plastic Pipes CE Certification  
Air Permeability



UAE Certificate of Compliance

دستور العمل ايجاز  
يتم اصداره من قبل  
الهيئة العامة للغذاء  
والدواء في دولة الامارات  
البحرينية



APPROVED  
CF5127



ETA 14-0044  
CE-1121-CPR-JA5023



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# Product Technical Data

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## Product Overview

### Technical Description of the Product

Pyropro HPE Sealant is an acrylic based graphite sealant used to reinstate the fire resistance performance of wall and floor constructions where they have been provided for the penetration of single or multiple services to form penetration seals where gaps are present.

Pyropro HPE Sealant expands upon contact with heat, and is considered as an intumescent or reactive material.

Pyropro HPE Sealant is supplied in liquid form constrained within 310ml cartridges. The sealant is gunned or trowelled into the annular space in or between the separating element/elements to a specific depth utilising various backing materials.

### Intended Use

The intended use of Pyropro HPE Sealant is to reinstate the fire resistance performance of rigid and flexible wall and floor constructions where they are penetrated by various cables, plastic and insulated metallic pipes.

The specific elements of construction that the system Pyropro HPE Sealant may be used to provide a penetration seal in, are as follows:

- Rigid wall and floors, flexible wall and batts in wall and floor.
- Linear Joints up to 20mm wide.
- Large service openings up to 300mm x 100mm.
- Batt aperture up to 1100mm x 750mm.
- Metallic Pipes, Cables, Cable Bunches (inc Telecommunication), Cable Trays and Cable Ladders.

### Key Product Points

- Lubrizol Approved.
- Combustible Pipes up to 125mm dia - PVC, PE, PP, ABS and PEX / MLC .
- Sealing elastomeric foam and glass wool insulation.
- In irregular applications.
- Causes no known affects to plastic pipes, plastic cables, sheathing or metallic components.
- Easy clean up with water and is odourless.
- Over paintable.
- Smoke, gas, water tight and air tight.
- High Expansion Ratio.
- Resists fungi and vermin.



# Product Technical Data

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Description	Result	Test Standards
Density	Ca. 1.23 - 1.33g/cm <sup>3</sup>	ISO 2811-1:2011
Shore Hardness A	68	ISO 7619-1:2010
Colour	Black	
Application Temperature	+5 °C to 35 °C	
Expansion Onset Temperature	Ca. 180 °C	
Expansion	Up to 20 times	EOTA TR 024
Expansion Pressure	7 bar	EOTA TR 024
Skin Time	15 minutes @ 25 °C/ 50%RH	
Cure Time	1.7mm per 24hrs	
Shelf Life	18 months unopened	
pH	6 - 9	
Fire Resistance	EI 120	EN1366-3 and EN1366-4
Insulation	120	EN 1366-3
Air Permeability	600Pa - 100Pa 11.1/16.7 m <sup>3</sup> /h/m <sup>2</sup>	EN1026
Classification	EN 13501-2, ISO 11600	
Manufacture	ISO 9001:2008	
Certifire 3rd Party Accreditation	CF 5127	
Acoustics	Rw (C;Ctr) : 52 (-1;-6) dB	EN ISO 10140-2:2010
Durability Services	Type Z1, intended for use in internal conditions	
BREEAM International	Compliant	GN22: BREEAM Recognised Schemes for VOC Emissions from Building Products
Lubrizol Test Method	Pass	NSF Referenece: P0128, P3111, P3147
Expected Shelf Life	At least 12 months	Stored in accordance with packaging instructions

## Backing Material

Mineral wool (min. 80kg/m<sup>3</sup>) or PE backing rod where required can be used as backing material for Pyropro HPE Sealant. Backing material is not needed within all installations, though the Pyropro HPE Sealant should be installed correctly to achieve the performance needed.

## Key Installation Points

Ensure that the aperture and services in question are tested with Pyropro HPE Sealant, and the site conditions are within the application specification. An annular space needs to be present around the service to allow sufficient installation depth.

All services and apertures need to be clean and clear of all dust and loose particles. The aperture temperature needs to be at 5°C or above at time of installation.

Upon installation make sure that you install the Pyropro HPE Sealant 20mm annular and 25mm deep around all services effectively, ensure that you fill all of the annulus and compact the Pyropro HPE Sealant into the annular gap.

Once compacted, smooth off the Pyropro HPE Sealant to produce a professional finish.



# Performance Data - Walls

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## Substrates

The walls shall be a minimum of **100mm thick**. Drywalls shall comprise a minimum of 2 layers of 'Type F' Gypsum board on both faces, with minimum 50mm studs. Masonry / Concrete walls shall have a minimum density for concrete or brick of 780kg/m<sup>3</sup> and for aerated concrete blocks of 600kg/m<sup>3</sup>. All walls shall have at least the same fire resistance as that required for the sealing system.

## Service support requirements

Services should be rigidly supported via steel angles, hangers or channels, not further than 400mm from the surface of the sealing system on both faces of the wall and top side of the floor unless specified otherwise in the performance data.

## Terminology

Fire performance in accordance with EN1366-3, EN1366-4, Classification 13501-2:2007 + A1:2009, ETAG-026, Air Permeability EN1026, Sound EN10140. Fire resistance classes are: E = Integrity, the product can withstand the fire from the non-fire side, I =Insulation, the product can withstand the temperature travelling down the service, U/U = Uncapped inside and outside the furnace, U/C = Uncapped inside and Capped outside the furnace, C/U = Capped inside and Uncapped outside the furnace.

## FLEXIBLE AND RIGID WALL

### Plastic Pipes

Flexible and Rigid wall construction with minimum wall thickness of 100mm.			
Penetration Specification	Pyropro HPE (installed both faces)	Backing Material	Classification
PVC Pipe 40mm ø 1.9mm wall thickness.	20mm annulus x 25mm deep.	N/A	EI120 C/U
PVC Pipe 125mm ø 9.2mm wall thickness.	20mm annulus x 25mm deep.	N/A	EI60 C/U
ABS Pipe 40mm ø 1.9mm wall thickness.	20mm annulus x 25mm deep.	N/A	EI120 C/U
HDPP Pipe 40mm ø 2mm wall thickness.	20mm annulus x 25mm deep.	N/A	EI120 C/U

### Metallic Pipes

Flexible and Rigid wall construction with minimum wall thickness of 100mm. Penetration Seal with PS Coating and Pyropro HPE Sealant.			
Penetration Specification	Backing Material	Pyropro HPE (installed both faces)	Classification
<b>Mild Steel or Copper and Cast Iron</b>			
40mm diameter and 1.5 - 14.2mm wall thickness.	20mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	15mm deep x 15mm wide annulus Pyropro HPE Sealant to both faces of the seal.	EI60 U/C
40 - 159mm diameter and 2.3 - 14.2mm wall thickness.	30mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).		E60 U/C EI45 U/C

Penetration Specification	Backing Material	Pyropro HPE (installed both faces)	Classification
<b>Mild Steel</b>			
40mm diameter and 1.7 - 14.2mm wall thickness.	20mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	15mm deep x 15mm wide annulus Pyropro HPE Sealant to both faces of the seal.	EI60 U/C
40 - 150mm diameter and 2.3 - 14.2mm wall thickness.	30mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).		



# Performance Data - Walls

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## FLEXIBLE AND RIGID WALL

Plastic Pipes and Cables

Flexible and Rigid wall constructions with minimum wall thickness of 120mm.			
Penetration Specification	Pyropro HPE (installed both faces)	Backing Material	Classification
PVC Pipe 40mm $\phi$ 1.9 - 3mm wall thickness.	10mm annulus x 25mm deep.	N/A	EI120 U/C
PVC Pipe 125mm $\phi$ 4.8 - 7.4mm wall thickness.	16mm annulus x 25mm deep.	30mm deep stone wool 80kg/m <sup>3</sup> .	EI120 U/C
HDPE Pipe 63mm $\phi$ 7.2mm wall thickness, Cables up to 21mm $\phi$ .	300mm wide x 100mm high x 25mm deep.	N/A	EI120 U/C
HDPE Pipe 90mm $\phi$ 9.2mm wall thickness.	12.5mm annulus x 25mm deep.	N/A	EI120 U/C
ABS Pipe 90mm $\phi$ 6mm wall thickness.	12.5mm annulus x 25mm deep.	N/A	EI120 U/C
Cables up to 21mm $\phi$ .	300mm wide x 100mm high x 25mm deep.	N/A	EI120 U/C

Insulated Metallic Pipes

Flexible and Rigid wall constructions with minimum wall thickness of 120mm.			
Penetration Specification	Pyropro HPE (installed both faces)	Backing Material	Classification
Copper / Steel Pipe / Cast Iron 60mm $\phi$ 0.8mm - 14.2mm wall thickness, insulated with 32mm 'Armaflex AF' (CS) Continued Sustained.	20mm annulus x 25mm deep	N/A	E120 U/C EI90 U/C
Copper / Steel Pipe / Cast Iron 15mm $\phi$ 0.8mm - 7mm wall thickness, insulated with 13mm 'Armaflex AF' (CS) Continued Sustained.	15mm annulus x 25mm deep	N/A	EI120 U/C

Pyropro HPE Linear Joint Seals with minimum 120mm thick Flexible or Rigid Wall.			
Substrate	Depth (mm)	Backing Material	Classification
Flexible Wall to Rigid Wall.	25mm. (Both Sides)	PE backing Rod	EI120 - V - X - F - W 00 to 20



# Performance Data - Walls

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## RIGID WALL

Rigid Walls with a minimum thickness of 150mm.			
Aperture Size	Seal Composition	Services	Classification
180mm x 180mm	The apertures were sealed using a 25mm depth of Pyropro HPE sealant. The sealant was applied flush to both sides of the wall with a backing of 20mm thick Rockwool RWA45 insulation with a measured density of 45kg/m <sup>3</sup> .	Electrical cables up to 21mm dia	E 180, EI 45
		Electrical cables 33mm to 80mm dia	E 180, EI 45
		100mm diameter bundle telecommunication cable type "F"	EI 240
		Steel or Copper Conduits up to 16mm	E 240, EI 45
		Plastic conduits up to 16mm	E 240, EI 90

Rigid Walls with a minimum thickness of 150mm.			
Aperture Size	Seal Composition	Services	Classification
180mm x 180mm	The apertures were sealed using a 25mm depth of Pyropro HPE sealant. The sealant was applied flush to both sides of the wall with a backing of 20mm thick Rockwool RWA45 insulation with a measured density of 45kg/m <sup>3</sup> .	Blank Seal	EI 240



# Performance Data - Batt

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## Substrates

The walls shall be a minimum of **100mm thick**. Drywalls shall comprise a minimum of 2 layers of 'Type F' Gypsum board on both faces, with minimum 50mm studs. Masonry / Concrete walls shall have a minimum density for concrete or brick of 780kg/m<sup>3</sup> and for aerated concrete blocks of 600kg/m<sup>3</sup>. All walls shall have at least the same fire resistance as that required for the sealing system.

## Service support requirements

Services should be rigidly supported via steel angles, hangers or channels, not further than 400mm from the surface of the sealing system on both faces of the wall and to the top side of the floor unless specified otherwise in the performance data.

## Terminology

Fire performance in accordance with EN1366-3, EN1366-4, Classification 13501-2:2007 + A1:2009, ETAG-026, Air Permeability EN1026, Sound EN10140. Fire resistance classes are: E = Integrity, the product can withstand the fire from the non-fire side, I =Insulation, the product can withstand the temperature travelling down the service, U/U = Uncapped inside and outside the furnace, U/C = Uncapped inside and Capped outside the furnace, C/U = Capped inside and Uncapped outside the furnace.

## STOPSEAL BATT

### Insulated Metallic Pipes

Flexible and Rigid wall constructions with minimum wall thickness of 100mm Stopseal Batt Penetration Seal and Pyopro HPE Sealant.			
Penetration Specification	Pyopro HPE (installed both faces)	Backing Material	Classification
Steel Pipe / Cast Iron 40mm Ø 1.7mm - 14.2mm wall thickness, insulated with 20mm Glass Wool Foil Faced 80kg/m <sup>3</sup> (CS) Continued / Sustained.	15mm annulus x 15mm deep	N/A	E90 U/C EI60 U/C
Copper / Steel Pipe / Cast Iron 40mm - 159mm Ø 2.4mm - 14.2mm wall thickness, insulated with 30mm Glass Wool Foil Faced 80kg/m <sup>3</sup> (CS) Continued / Sustained.	15mm annulus x 15mm deep	N/A	EI60 U/C

### Insulated Metallic Pipes

Flexible and Rigid wall constructions with minimum wall thickness of 100mm PS Coating Penetration Seal and Pyopro HPE Sealant.			
Penetration Specification	Pyopro HPE (installed both faces)	Backing Material	Classification
Steel Pipe / Cast Iron 40mm Ø 1.5mm - 14.2mm wall thickness, insulated with 20mm Glass Wool Foil Faced 80kg/m <sup>3</sup> (CS) Continued / Sustained.	15mm annulus x 15mm deep	N/A	E90 U/C EI60 U/C
Copper / Steel Pipe / Cast Iron 40mm - 159mm Ø 2.3mm - 14.2mm wall thickness, insulated with 30mm Glass Wool Foil Faced 80kg/m <sup>3</sup> (CS) Continued / Sustained.	15mm annulus x 15mm deep	N/A	EI60 U/C

### Plastic Pipes

Pyopro HPE Penetration Seals. Single Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyopro HPE	Stopseal Coated Batt	Classification
PVC Pipe 50mm -125mm Ø 2.4 - 7.4mm wall thickness.	20mm annulus full 50mm depth of the Stopseal Coated Batt.	Single layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI45 U/C





# Performance Data - Batt

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## STOPSEAL BATT

Cables and Cable Trays

Pyropro HPE Penetration Seals. Single Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
*500mm perforated cable tray.	20mm gap full 50mm depth of the Stopseal Coated Batt.	Single layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI30
*Electrical cable up to cable tray.			EI45
*1 off 'C1' Cable.			
*1 off 'C2' Cable.			
*1 off 'C3' Cable.			

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

Pyropro HPE Penetration Seals. Single layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
PEX / MLC (Multilayer Composite) Pipe 40mm Ø 4mm wall thickness.	20mm annulus full 50mm depth of the Stopseal Coated Batt.	Single layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	E45 U/C EI30 U/C
PEX / MLC (Multilayer Composite) Pipe 50mm Ø 4.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 63mm Ø 6mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 75mm Ø 7.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 90mm Ø 8.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 110mm Ø 10mm wall thickness.			

Pyropro HPE Penetration Seals. Double Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
PVC Pipe 50mm - 125mm Ø 2.4 - 7.4mm wall thickness	20mm annulus 25mm deep both faces of the Stopseal Coated Batt	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide	EI120 U/C

Cables and Cable Trays

Pyropro HPE Penetration Seals. Double Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
*500mm perforated cable tray	20mm annulus 25mm deep both faces of the Stopseal Coated Batt	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide	EI120

Pyropro HPE Penetration Seals. Double Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.			
Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
*500mm perforated cable tray	20mm annulus, 25mm deep both faces of the Stopseal Coated Batt	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide	EI120
*Electrical cable up to 21mm Ø			
*1 off 'C1' Cable			E 120 EI90
*1 off 'C2' Cable			
*1 off 'C3' Cable			EI120

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



# Performance Data - Batt

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## STOPSEAL BATT

**Pyropro HPE Penetration Seals. Double layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Wall.**

Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
PEX / MLC (Multilayer Composite) Pipe 40mm Ø 4mm wall thickness.	20mm annulus, 25mm deep both faces of the Stopseal Coated Batt.	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI120 U/C
PEX / MLC (Multilayer Composite) Pipe 50mm Ø 4.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 63mm Ø 6mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 75mm Ø 7.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 90mm Ø 8.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 110mm Ø 10mm wall thickness.			

### Plastic Pipes

**Pyropro HPE Penetration Seals. Double Layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Floor.**

Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
PVC Pipe 50mm - 125mm Ø 2.4 - 7.4mm wall thickness.	20mm annulus 25mm deep both faces of the Stopseal Coated Batt.	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI120 U/C
PVC Pipe 50mm - 125mm Ø 2.4 - 7.4mm wall thickness.	20mm annulus 25mm deep both faces of the Stopseal Coated Batt.	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI90 U/C

### Cables and Cable Trays

Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
*500mm perforated cable tray.	20mm annulus, 25mm deep both faces of the Stopseal Coated batt.	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI120
*Electrical cables up to 21mm Ø.			
*1 off 'C1' Cable.			E 120 EI60
*1 off 'C2' Cable.			EI120
*1 off 'C1' Cable.			

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

**Pyropro HPE Penetration Seals. Double layer of 50mm thick Stopseal Coated Batt installed with minimum 150mm thick Rigid Floor.**

Penetration Specification	Pyropro HPE	Stopseal Coated Batt	Classification
PEX / MLC (Multilayer Composite) Pipe 40mm Ø 4mm wall thickness.	20mm annulus, 25mm deep both faces of the Stopseal Coated Batt.	Double layer of 50mm Stopseal Coated Batt max 1100mm high x 750mm wide.	EI120 U/C
PEX / MLC (Multilayer Composite) Pipe 50mm Ø 4.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 63mm Ø 6mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 75mm Ø 7.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 90mm Ø 8.5mm wall thickness.			
PEX / MLC (Multilayer Composite) Pipe 110mm Ø 10mm wall thickness.			



# Performance Data - Batt

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## STOPSEAL BATT

Metallic Pipes With Insulation

Flexible and Rigid wall constructions with minimum wall thickness of 100mm, Penetration seal with Stopseal Coated Board and Pyropro HPE Sealant installed centrally within the wall.

Penetration Specification	Pyropro HPE (installed both faces)	Backing Material	Classification
Copper / Steel Pipe and Cast Iron 40mm $\phi$ 1.5mm - 14.2mm wall thickness insulated with 32mm 'Armaflex AF' (LS 650mm) Local Sustained 650mm.	20mm annulus x 25mm deep	N/A	E120 C/U EI30 C/U
Copper / Steel Pipe and Cast Iron 40mm - 159mm $\phi$ 2.0mm - 14.2mm wall thickness insulated with 32mm 'Armaflex AF' (LS 650mm) Local Sustained 650mm.	20mm annulus x 25mm deep	N/A	E120 C/U EI30 C/U
Copper / Steel Pipe and Cast Iron 40mm - 159mm $\phi$ 2.0mm - 14.2mm wall thickness insulated with 32mm 'Armaflex AF' (LS 650mm) Local Sustained 650mm.	20mm annulus x 25mm deep	N/A	E120 C/U EI30 C/U
Copper / Steel and Cast Iron Pipe 40mm diameter and 1.5 - 14.2mm wall.	15mm deep x 15mm wide annulus Pyropro HPE Sealant to both faces of the seal	20mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	E90 U/C EI60 U/C
Copper / Steel and Cast Iron Pipe 40 - 159mm diameter and 2.3 - 14.2mm wall.	annulus Pyropro HPE Sealant to both faces of the seal	30mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	EI60 U/C
Steel Pipe / Cast Iron 40mm diameter and 1.7 - 14.2mm wall.	15mm deep x 15mm wide annulus Pyropro HPE Sealant to both faces of the seal	20mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	E90 U/C EI60 U/C
Steel Pipe / Cast Iron 40 - 150mm diameter and 2.3 - 14.2mm wall.	annulus Pyropro HPE Sealant to both faces of the seal	30mm thick foil faced glass wool insulation (min 80kg/m <sup>3</sup> ).	EI60 U/C



# Performance Data - Floor

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## Substrates

The floors shall be a minimum of **150mm thick**. Masonry / Concrete floors shall have a minimum density for concrete or brick of 780kg/m<sup>3</sup> and for aerated concrete blocks of 600kg/m<sup>3</sup>. All floors shall have at least the same fire rating as that required for the Sealing system.

## Service support requirements

Services should be rigidly supported via steel angles, hangers or channels, not further than 400mm from the surface of the sealing system on both faces of the wall and to the top side of the floor unless specified otherwise in the performance data.

## Terminology

Fire performance in accordance with EN1366-3, EN1366-4, Classification 13501-2:2007 + A1:2009, ETAG-026, Air Permeability EN1026, Sound EN10140. Fire resistance classes are: E = Integrity, the product can withstand the fire from the non-fire side, I =Insulation, the product can withstand the temperature travelling down the service, U/U = Uncapped inside and outside the furnace, U/C = Uncapped inside and Capped outside the furnace, C/U = Capped inside and Uncapped outside the furnace.

## RIGID FLOOR

### Insulated Metallic Pipes

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
Copper/Steel Pipe and Cast iron 41mm - 159mm $\phi$ 2.5mm - 14.2mm wall thickness, insulated with 16mm - 32mm 'Armaflex' (CS) Continued Sustained.	25mm deep	20mm annulus	100mm deep stone wool 45kg/m <sup>3</sup>	EI20 U/C

### Plastic Pipes

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
PP Pipe 110mm $\phi$ 3.7mm wall thickness.	25mm deep	20mm annulus	100mm deep stone wool 45kg/m <sup>3</sup>	EI30 U/C
PP Pipe 110mm $\phi$ 10.7mm wall thickness.				EI120 U/C
PP Pipe 50mm $\phi$ 2.1mm wall thickness.				EI240 U/C

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
PE Pipe 40mm $\phi$ 4.1mm wall thickness.	25mm deep	20mm annulus	100mm deep stone wool 45kg/m <sup>3</sup>	EI240 U/C
PE Pipe 125mm $\phi$ 7.6mm wall thickness.				EI60 U/C
PE Pipe 125mm $\phi$ 11.4mm wall thickness.				EI90 U/C

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
PVC Pipe 40mm $\phi$ 2mm wall thickness.	25mm deep	20mm annulus	100mm deep stone wool 45kg/m <sup>3</sup>	EI240 U/C
PVC Pipe 114mm $\phi$ 3.6mm wall thickness.				E90 U/C EI45 U/C
PVC Pipe 114mm $\phi$ 8.1mm wall thickness.				EI120 U/C



# Performance Data - Floor

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## RIGID FLOOR

### Plastic Pipes, Conduits and Cables

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
Three PE pipes; 40mm $\varnothing$ x 4.1mm wall thickness, 60mm $\varnothing$ x 4.0mm thick wall and 125mm $\varnothing$ x 7.6mm thick wall, all fitted centrally in the aperture. 60mm $\varnothing$ pipe filled with electrical cables; three A1, three A2 and three A3 cables and one B cable.	25mm deep	250mm x 250mm	100mm deep stone wool 45kg/m <sup>3</sup>	E120 U/C EI90 U/C

### Metallic Pipes With Insulation

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
Copper / Steel Pipe and Cast Iron 41mm $\varnothing$ 1.4mm - 14.2mm wall thickness, insulated with 16mm 'Armaflex' (CS) Continued Sustained.	25mm deep	20mm annulus	100mm deep stone wool 45kg/m <sup>3</sup>	E240 U/C EI60 U/C

### Cables and Cable Trays

Rigid floor construction with minimum floor thickness of 150mm.				
Penetration Specification	Pyropro HPE (installed both faces)	Aperture Size (mm)	Backing Material	Classification
Electrical Cables 0 - 21mm $\varnothing$ .	25mm deep	Max 200mm x 200mm Min 50mm x 50mm	100mm deep stone wool 45kg/m <sup>3</sup>	E180 EI 20
Electrical Cables 22mm - 80mm $\varnothing$ .				E120 EI20
Non sheathed electrical cable 0 -24mm $\varnothing$ .				E180 EI15
Up to 21mm $\varnothing$ telecom cables in bundles of up to 100mm diameter.				E180 EI20



# Performance Data - Uponor Valve

ETA 14-0044  
CE-1121-CPR-JA5023

## Uponor Valve System

The drywall construction was of overall dimensions 3000mm wide by 3000mm high by 100mm thick. The framing comprised 50mm wide galvanised mild steel studs, at maximum 600mm centres, friction fitted into galvanised steel head and base channels. Each side of the stud frame was faced with two layers of 12.5mm thick 'Gypsum' Type F plasterboard. The framework was infilled with 50mm thick mineral wool insulation having a nominal density of 100kg/m<sup>3</sup>. The wall was provided with eight circular apertures, which was penetrated by a range of shower units.

Aperture	Seal type	Service
2no. 75mm diameter apertures	The aperture was sealed with a nominally 10mm wide by 25mm depth of FSi Limited "Pyropro HPE Sealant (high pressure exerting)" Sealant, applied flush with the unexposed face of the wall.	Uponor water valve with tap unit fitted to project from the unexposed face of the partition.
2no. 75mm diameter apertures	The aperture was sealed with a nominally 10mm wide by 25mm depth of FSi Limited "Pyropro HPE Sealant (high pressure exerting)" Sealant, applied flush with the exposed face of the wall.	Uponor water valve with tap unit fitted to project from the unexposed face of the partition.
2no. 75mm diameter apertures	The aperture was sealed with a nominally 10mm wide by 25mm depth of FSi Limited "Pyropro HPE Sealant (high pressure exerting)" Sealant, applied flush with the unexposed face of the wall.	Uponor water valve with tap unit fitted to project from the unexposed face of the partition.
2no. 75mm diameter apertures	The aperture was sealed with a nominally 10mm wide by 25mm depth of FSi Limited "Pyropro HPE Sealant (high pressure exerting)" Sealant, applied flush with the exposed face of the wall.	Uponor water valve with tap unit fitted to project from the unexposed face of the partition.

Integrity (minutes)	Insulation (minutes)
132*	132*
132*	132*
132*	132*
132*	132*

\* The test duration. The test was discontinued after a period of 132 minutes.



# Extended Scope of Works

## Direct field of application – DiAP and Extended Field of Application- EXAP

DiAP and EXAP rules are an output from European harmonization of fire testing methods, classifications and product standards where applicable. At a national level, experienced persons or fire test organisations have previously provided assessments of expected performance based on expert judgement and opinion, however these rules allow interpretation through the specific EN 1366 test standard.

DiAP and EXAP rules are provided in the EN 1366 and EN 15882 test standards series. They are derived from information obtained from tests carried out in accordance with relevant EN 1366 tests at recognised laboratories in Europe. The test results achieved by a particular design may be directly applied to a limited number of variations without recourse to expert advice, providing the design remains substantially as tested. EXAPs shall be based on primary test evidence to a specific part of the EN 1366 series and may be supplemented by appropriate test evidence generated from other sources, or other relevant historical data. The EXAP rules consider changes in the tested design beyond the scope of direct application and may also consider variations to the tested design.

### Direct field of application - DiAP

Fire Stopping systems of this type are often complicated by extensive changes in modern buildings and their influence on the fire hazard should be considered carefully. The fire hazard can be reduced by providing penetration seals at the points where the services pass through fire separating elements (walls/floors).

The impact of fire on a construction or service system can vary considerably. A strict scientific approach to the problem of adequate testing of a sealing system would, therefore, be to design a series of tests each of which corresponds to a specified fire situation and arrangement. However, such an approach would probably fail due to its economic consequences, as tests of this type are very timeconsuming and costly. The method of test described in the EN 1366 series has therefore been designed with the intention of covering a wide range of fire situations in a minimum of tests. To allow a wider field of application, standard configurations are defined on the basis of general experience and historic data wherever possible. As frequently a number of influencing parameters was considered when defining the standard configurations, not all of which may be addressed explicitly in the field of direct application rules (e.g. metalscreen of cables). To allow nevertheless flexibility a modular approach was taken as far as possible so that various combinations of standard configuration elements can be used to fit the needs of the user.

Where a nonstandard configuration was used, the field of application is restricted to what was tested, however the field of direct application rules given in the various parts of the EN 1366 series may be applied, subject to deviating rules given in the annexes of each part. Rules cover supporting construction, orientation, penetrating services, service supports, penetration seal size, distances and overall configurations of penetration seal materials and services to be included.

### Extended Field of Application- EXAP

The purpose EXAP document is to provide the principles and guidance for the preparation of extended application documents for penetration sealing systems tested in accordance with the EN 1366 and EN 15882 series. The field of the extended application document is additional to the direct field of application given within the relevant part of EN 1366 and may be applied to or based on a single test, or a number of tests, which provide the relevant information for the formulation of an extended application.

There are a number of practical limitations on the size and design of elements that can be tested by the standard methods of fire resistance test. When these elements are required to be larger, or are of a modified design, there is a necessity to be able to confirm their performance, without the ability of being able to test them. To achieve this, extended application documents for the various elements are used.

Due to the diverse nature of materials and constructions used to seal openings in fire resistant separating elements it has been necessary to separate the extended application principles into generic seal types within the specific EXAP EN 15882 series. Often more than one variation is to be incorporated, should this be the case the overall effect shall be considered. Principles common to all generic seal types are given in the EXAP and rules for each specific generic seal type are given. The Annex provide rules for the application of test results and provides information relating to the extended application of those test results on for service penetrations.

Variables for each seal type, which require consideration included are as follows:

- 1) Separating element;
- 2) Type of service;
- 3) Size of service;
- 4) Seal size and configuration
- 5) Material changes (components or formulation) – comparison test approach, reduced test program
- 6) Orientation
- 7) Penetration seals at the head of walls (like a linear joint) – consider the issue of movement
- 8) Penetration seals at slab edges (like a linear joint) – consider the issue of movement
- 9) Distances of penetration seals to other openings in the separating element e.g. doors





FSi has Technical Representatives who provide assistance in the selection and specification of FSi products. For more information, specification and technical advice please call our Head Office on Tel: +44 (0) 1530 515130. Guarantee / Warranty: FSi products are manufactured to rigid standards of quality. Any product which has been applied in accordance with FSi's written instructions and in any application recommended by FSi, but which is proved to be defective in product quality, will be replaced free of charge. No liability can be accepted for the information provided in this document although it is published in good faith and believed to be correct. FSi Limited reserves the right to alter product specifications without prior notice, in line with our Company policy of continuous development and improvement.