FSi DEVELOP MANUFACTURE PROTECT
FIRE STOPPING & COMPARTMENTATION SYSTEMS

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PyroSeal 2K

Technical Data Sheet

UIC of product-type: 2K

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Contents

Product Technical Data

ETA 18-0897
0761 - CPR - 0741

Product Overview

Product description:

PyroSeal2K Expanding Sealer is a 2-component polyurethane sealant system, manufactured with halogen-free intumescent fire retardants. On application the two components are mixed through a screw nozzle resulting in a reaction which causes the product to expand and swell around penetrating services.

PyroSeal 2K is intended to be used as a mixed penetration seal or cable penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been provided with apertures which are penetrated by various cables, conduits/ tubes, metal pipes, plastic pipes cable support constructions (perforated or non-perforated steel cable trays and steel ladders.)

Certification & Testing:

- Tested in accordance with EN1366-3:2009 – Fire Resistance – Penetration Seals
- Classified in accordance with EN13501-2 – Fire Resistance
- Classified in accordance with EN13501-1 – Reaction to Fire
- CE Marked – ETA 18-0897
- Conditioned in accordance with EOTA TR024 – Z1 Type
- Tested in accordance with EN10140-2:2010 – Airborne Sound
- Tested in accordance with EN1026:2016 - Air Permeability
- Tested in accordance with EN12667:2001 & EN12664:2001 - Thermal Properties

Areas of Use:

- To reinstate fire resistance through walls and floors
- Prevention of air leakage
- Maintains Acoustic performance
- Assumed working life 10 years

Advantages:

- Flexible, high performance 2-component PU Sealer
- Expands on application, filling apertures and openings quickly and cleanly
- Conditioned to Type Z1 in accordance with EOTA TR024.
- Tested in accordance with many major global certification standards
- Easy gunning and tooling
- Tested practically, with the installer in mind.
- Manufactured and tested alongside the entire PyroSeal System range.

Product Technical Data

ETA 18-0897
0761 - CPR - 0741

Description	Result	Test Standards
Packaging	380ml cartridge	
Colour	Red-Brown	
Transport / storage:	Dry and only in the original packaging	
Storage temperature:	5 °C to 30 °C	
Storage stability:	12 months at 23 °C/ 50 % rel. humidity, See imprint on cartridge for expiry date	
Application temperature:	15 °C to 30 °C, recommended: 20 °C to 25 °C	
Foam yield*:	Up to 2.1 litres	
Foaming set time*:	Approx. 50 seconds (at 22 °C material temperature and ambient temperature)	
Foaming set time for cutting*:	After approx. 90 seconds (at 22 °C material temperature and ambient temperature)	
Bulk density (material has fully reacted): **Safety notices:**	ρ ≥ 215 kg/m³ Please observe the safety data sheet.	
Classification of the fire protection behaviour in accordance with DIN EN 13501-1:	Class E	
Expansion pressure:	No expansion pressure measurable	
Foaming factor:	1.6x to 4.5x Tested on samples at 450°C for more than 25 minutes with super-imposed load. The foaming factor is a laboratory characteristic value. The foaming behavior in installed status depends on the existing boundary conditions.	
Air permeability:	Q600 ≤ 0.08 m³/(h*m2) (no air permeability was measurable at a differential pressure of 600 Pa and a measurement accuracy of 0.01 m³/h) Test standard: EN 1026 (test specimen dimensions 350 x 350 x 200 [mm], tested without penetrating elements) Q50 = 0.39 m3/(h*m2) / Q600 = 4.09 m3/(h*m2) Test standard: EN 1026 (test specimen dimensions 360 x 360 x 144 [mm], tested without penetrating elements)	
Resistance to static diferential pressure:	Pmax = 10000 Pa Test standard: In accordance with EN 12211 (test specimen dimensions 350 x 350 x 200 [mm], tested without penetrating elements) Pmax = 8800 Pa Test standard: In accordance with EN 12211 (test specimen dimensions 360 x 360 x 144 [mm], tested without penetrating elements)	
Thermal Conductivity	Thermal conductivity: λ = 0.088 W/(m*K) R = 0.279 m²*K/W Test standard: DIN EN 12667	
Airborne sound insulation:	Dn,e,w(C;Ctr) = 62 (-1; -5) dB Rw(C;Ctr) = 43 (-1; -5) dB Test standard: EN ISO 717-1 (test specimen dimensions 350 x 350 x 144 [mm], tested without penetrating elements) Dn,e,w(C;Ctr) = 66 (-1; -6) dB Rw(C;Ctr) = 47 (-1; -6) dB Test standard: EN ISO 717-1 (test specimen dimensions 360 x 360 x 200 [mm], tested without penetrating elements)	
Surface resistance:	R0 = 1.25 x 109 Ω Test standards: DIN EN 60079-0 (VDE 0170-1):2013-04 Section 7.4 including application of note 2 of Section 7.4.2, IEC 60079-0:2011 and modified + Cor.:2012, EN 60079-0:2012, EN 80079-36 and TRGS 727:2016-07-29	

* Changes depending on the material temperature and ambient temperature.

Product Technical Data

ETA 18-0897
0761 - CPR - 0741

Description	Result	
Indoor air hygiene	Requirements of AgBB Scheme 2015 are fulfilled Test standards: prEN 16516, ISO 16000-3, ISO 16000-6, ISO 16000-9 Test lab: eco-INSTITUT Germany GmbH, Cologne Date: 22/08/2017	
VOC emission class	A+ in accordance with French decree no. 2011-321 Test standards: ISO 16000-3, ISO 16000-6, ISO 16000-9, ISO 16000-11, ISO 16017-1	
Thermal stress:	Continuous contact or ambient temperature:	≤ 80 °C
Permissible ambient conditions	Use category Z1 Fire-retardant sealing products for use in indoor areas with all moisture levels at temperatures ≥ 0 °C. Occasional, brief spray water stress does not pose a problem. Overall, continuous wet conditions as well as standing water and pressing water must be avoided.	
Influence of coating materials and chemicals:	The following paints and occasional, brief influence of chemicals do not cause any change in the technical fire protection properties: Coating materials: Dispersion paint, alkyd resin paint, polyurethane acrylic lacquer, epoxy resin lacquer Solvent/oil: Trichloroethylene, xylene, acetone, white spirit, butyl acetate, butanol, domestic fuel oil Gaseous chemicals: Brief storage over concentrated ammonia solution Comment: Environmental conditions with high humidity levels and/or some coating materials and chemicals can cause minor lightening of the colour.	
Contact with metals and plastics:	The surface consistency of aluminium, stainless steel, galvanised steel and plastics made of poly-ethylene and polyvinyl chloride is not affected in a negative way upon contact with Fire Protection Foam PyroSeal2k.	

Installation Guidance

ETA 18-0897
0761 - CPR - 0741

If the mixing nozzle is clogged, never use force to press out the material, force can destroy the cartridge or the dispensing gun. Wear suitable protective gloves, safety glasses and protective clothing for the work.

1. Clean the appature or opening. Cardboard, plastic sheet or duct tape can be used as form work and it can remain on the surface.
2. Hold the cartridge vertically with the cap pointing upward, unscrew the cap and firmly screw on the provided mixing nozzle.
3. Insert the cartridge into the intended dispensing gun.
4. Start pressing out and discard non-mixed initial material.
5. Fill the opening from back to front. In this process build up the foam from bottom to top, always guide the tip of the mixing nozzle above the foam so that the material does not stick or clog. After a work interruption longer than approximately 50 seconds the foam hardens in the mixing nozzle, which then must be replaced. Prior to changing the mixing nozzle, offload the dispensing gun, and carefully replace the mixing nozzle.
6. After approx. 2 minutes projecting foam residues can be cut off with a suitable knife in compliance with the necessary protective measures and safety regulations.
7. Cables or pipes that will be installed retroactively can be routed through the existing foam. Refill gaps due to removed cables or pipes with PyroSeal 2k.
8. Large free areas can be filled with PyroSealBricks.

Processing of PyroSeal Brick

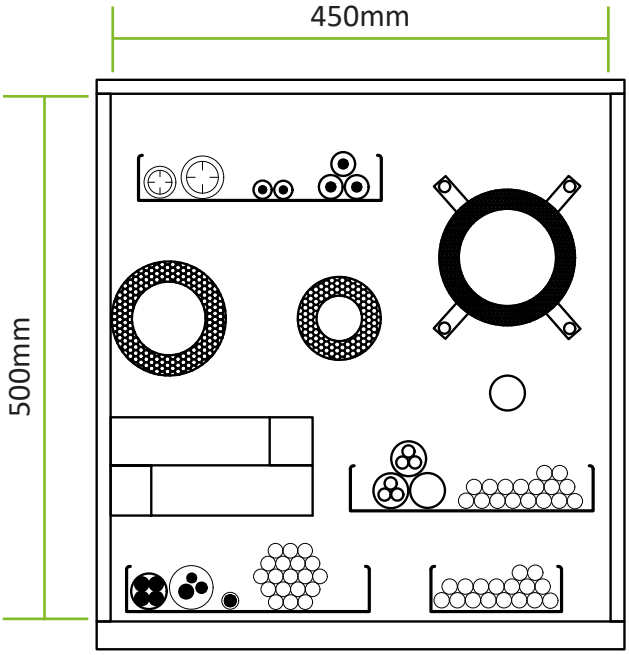
1.Areas that are not penetrated by cables, cable support systems, conduits or pipes can be sealed with PyroSeal Brick.
2.The PyroSeal Brick must be installed in such a manner that the minimum seal thickness is maintained.
3.Remove the protective foil of the PyroSeal Brick and install them in layers (like in a brick wall, i.e. layer-by-layer offset of the vertical butt joints) so that they fit tightly in the opening.

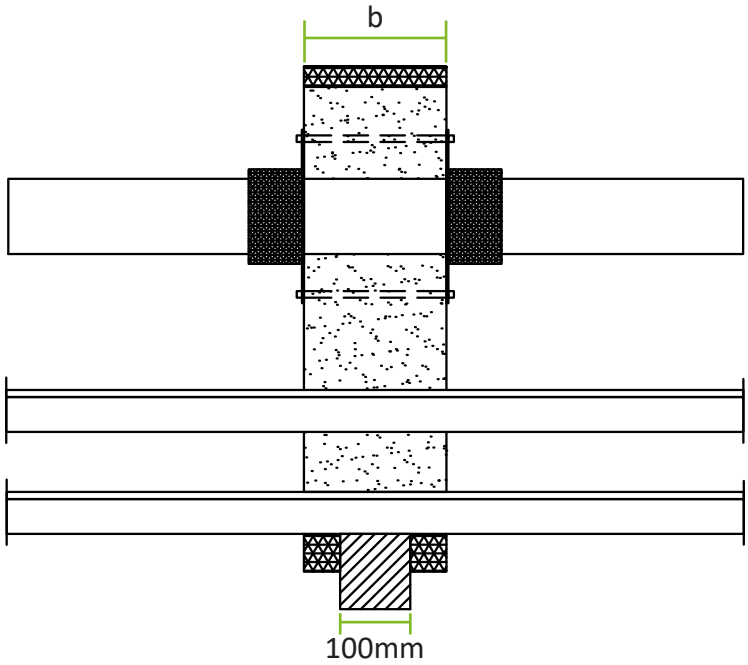
Separating element	Fire Resistance Classification	Wall Thickness	Max. Opening Size		Thickness of Penetration Seal (b)
See tables below		100mm	450mm	500mm	See tables below for (b)

Performance Data - Walls

ETA 18-0897
0761 - CPR - 0741

PyroSeal Installation Guidance Drawing for Wall





	Penetrating Service	Aperture	Min. thickness of mixed penetration seals	Classification
Cables	Sheathed electrical / telecommunication / optical fibre cables up to a maximum outer diameter of 80mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 144mm	E 120 EI 60
	Tied bundles up to 100mm overall diameter containing sheathed electrical / telecommunication / optical fibre cables up to a max. outer diameter of 21mm			E 120 EI 60
	Non-sheathed cables up to a maximum outer diameter of 24mm			E 120 EI 45
Conduits / tubes	Steel conduits / tubes up to Ø 16mm with / without cables			E 120 U/C EI 60 U/C
	Plastic conduits / tubes up to Ø 16mm with / without cables			E 120 U/C EI 90 U/C
	Plastic conduits up to Ø 40mm and bundles up to Ø 80mm consisting of plastic conduits (Ø ≤ 40mm) with / without cables			E 120 U/C EI 90 U/C
	Plastic conduits up to Ø 40mm and bundles up to Ø 100mm consisting of plastic conduits (Ø ≤ 63mm) with / without cables			E 120 U/C EI 120 U/C
	Speed Pipe up to Ø 12mm and bundles up to Ø 80mm consisting of speed pipe (Ø ≤ 12mm) with / without fibre cables			E 120 U/C EI 120 U/C

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

2. PyroSeal Wrap has to be applied on both surfaces of wall or floor.

3. PyroSeal Collar has to be applied on both surfaces of wall or bottom surface of floor.

Performance Data - Walls

ETA 18-0897
0761 - CPR - 0741

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Non-insulated metal pipes	Copper pipes up to a max. outer diameter of 28mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 144mm	E 120 C/U EI 60 C/U
	Steel pipes up to a max. outer diameter of 35mm			E 120 C/U EI 90 C/U
Pre-insulated metal pipes	WICU Frio pipes up to a max. outer diameter of 22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Clim pipes up to a max. outer diameter of 22,22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Flex pipes up to a max. outer diameter of 22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Eco pipes up to a max. uter diameter of 35mm			E 120 C/U (2) EI 60 C/U (2)
	Tubolit Split / Duosplit pipes up to a max outer diameter of 12.7mm			E 120 C/U EI 60 C/U
	Tubolit Split / Duosplit pipes uo to a max. outer diameter of 22,22mm			E 120 C/U EI 60 C/U
Insulated metal pipes	Mineral wool insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diamter of 88.9mm			E 120 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 168.3mm			E 120 C/U EI 120 C/U
	AF / Armaflex (thickness 9mm) insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	AF / Armaflex (thickness > 9mm insulated metal pipes up to a max. outer diameter of 88.9mm			E 120 C/U EI 90 C/U

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Plastic pipes / tubes	SC-SH-16/E30, SC-SH-18/E30 and SC-SH-20/E30 (drain hose) up to a max. outer diameter of 28mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 144mm	E 120 U/U EI 60 U/U
	Plastic pipes up to a max. outer diameter of 50mm			E 120 U/C EI 120 U/C
	Plastic pipes up to a max. outer diameter of 110mm			E 120 U/U (3) EI 120 U/U (3)

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

2. PyroSeal Wrap has to be applied on both surfaces of wall or floor.

3. PyroSeal Collar has to be applied on both surfaces of wall or bottom surface of floor.

Performance Data - Walls

ETA 18-0897
0761 - CPR - 0741

	Penetrating Service	Aperture	Min. thickness of mixed penetration seals	Classification
Cables	Sheathed electrical / telecommunication / optical fibre cables up to a maximum outer diameter of 80mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 200mm	E 120 EI 90
	Tied bundles up to 100mm overall diameter containing sheathed electrical / telecommunication / optical fibre cables up to a max. outer diameter of 21mm			E 120 EI 90
	Non-sheathed cables up to a maximum outer diameter of 24mm			E 120 EI 60
Conduits / tubes	Steel conduits / tubes up to Ø 16mm with / without cables			E 120 U/U EI 90 U/U
	Plastic conduits / tubes up to Ø 16mm with / without cables			E 120 U/U EI 120 U/U
	Plastic conduits up to Ø 40mm and bundles up to Ø 80mm consisting of plastic conduits (Ø ≤ 40mm) with / without cables			E 120 U/C EI 120 U/C
	Plastic conduits up to Ø 40mm and bundles up to Ø 100mm consisting of plastic conduits (Ø ≤ 63mm) with / without cables			E 120 U/C EI 120 U/C
	Speed Pipe up to Ø 12mm and bundles up to Ø 80mm consisting of speed pipe (Ø ≤ 12mm) with / without fibre cables			E 120 U/C EI 120 U/C

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

2. PyroSeal Wrap has to be applied on both surfaces of wall or floor.

3. PyroSeal Collar has to be applied on both surfaces of wall or bottom surface of floor.

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ETA 18-0897
0761 - CPR - 0741

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Non-insulated metal pipes	Copper pipes up to a max. outer diameter of 28mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 200mm	E 120 C/U EI 90 C/U
	Steel pipes up to a max. outer diameter of 35mm			E 120 C/U EI 90 C/U
Pre-insulated metal pipes	WICU Frio pipes up to a max. outer diameter of 22mm			E 120 C/U [1] EI 90 C/U [1]
	WICU Clim pipes up to a max. outer diameter of 22,22mm			E 120 C/U [1] EI 90 C/U [1]
	WICU Flex pipes up to a max. outer diameter of 22mm			E 120 C/U [1] EI 90 C/U [1]
	WICU Eco pipes up to a max. outer diameter of 35mm			E 120 C/U [2] EI 60 C/U [2]
	Tubolit Split / Duosplit pipes up to a max. outer diameter of 12.7mm			E 120 C/U EI 120 C/U
	Tubolit Split / Duosplit pipes up to a max. outer diameter of 22,22mm			E 120 C/U EI 90 C/U
Insulated metal pipes	Mineral wool insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 88.9mm			E 120 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 168.3mm			E 120 C/U EI 120 C/U
	AF / Armaflex (thickness 9mm) insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	AF / Armaflex (thickness > 9mm insulated metal pipes up to a max. outer diameter of 88.9mm			E 120 C/U EI 120 C/U

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Plastic pipes / tubes	SC-SH-16/E30, SC-SH-18/E30 and SC-SH-20/E30 (drain hose) up to a max. outer diameter of 28mm	Flexible wall 100mm thickness (max. opening size of 450mm x 500mm)	b ≤ 200mm	E 120 U/U EI 60 U/U
	Plastic pipes up to a max. outer diameter of 50mm			E 120 U/U EI 120 U/U
	Plastic pipes up to a max. outer diameter of 110mm			E 120 U/U [3] EI 120 U/U [3]

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

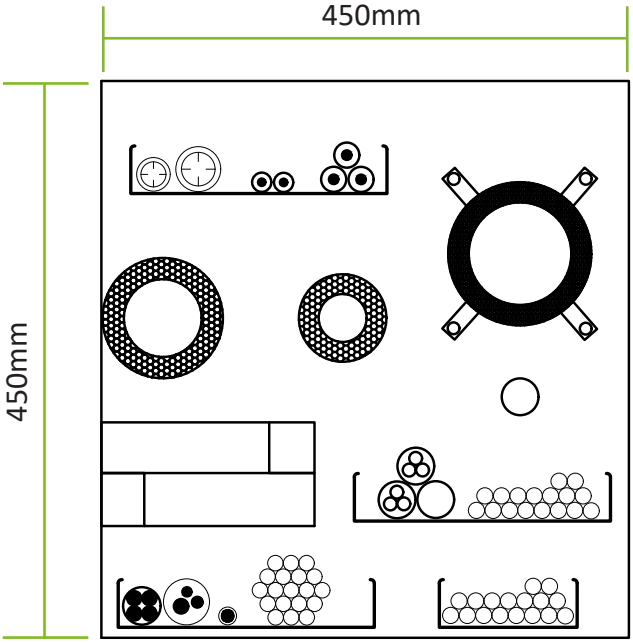
2. Pyro SealWrap has to be applied on both surfaces of wall or floor.

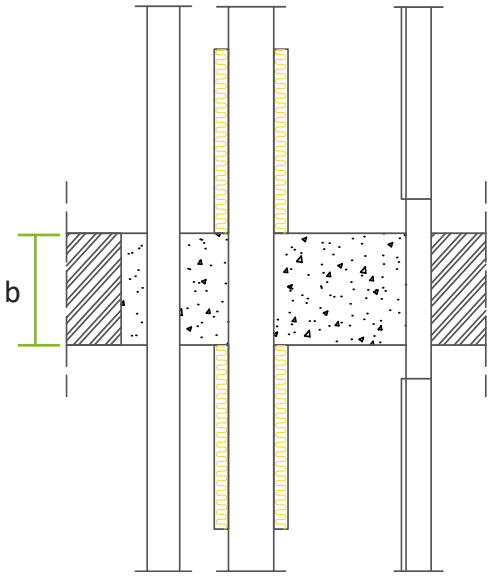
3. PyroSeal Collar has to be applied on both surfaces of wall or bottom surface of floor.

Performance Data - Floor

ETA 18-0897
0761 - CPR - 0741

PyroSeal Installation Guidance Drawing for Floor





	Penetrating Service	Aperture	Min. thickness of mixed penetration seals	Classification
Cables	Sheathed electrical / telecommunication / optical fibre cables up to a maximum outer diameter of 80mm	Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 144mm	E 60 EI 60
	Tied bundles up to 100mm overall diameter containing sheathed electrical / telecommunication / optical fibre cables up to a max. outer diameter of 21mm			E 60 EI 60
	Non-sheathed cables up to a maximum outer diameter of 24mm			E 60 EI 35
Conduits / tubes	Steel conduits / tubes up to Ø 16mm with / without cables			E 60 U/C EI 60 U/C
	Plastic conduits / tubes up to Ø 16mm with / without cables			E 60 U/C EI 60 U/C
	Plastic conduits up to Ø 40mm and bundles up to Ø 80mm consisting of plastic conduits (Ø ≤ 40mm) with / without cables			E 60 U/C EI 60 U/C
	Plastic conduits up to Ø 40mm and bundles up to Ø 100mm consisting of plastic conduits (Ø ≤ 63mm) with / without cables			E 60 U/C EI 60 U/C
	Speed Pipe up to Ø 12mm and bundles up to Ø 80mm consisting of speed pipe (Ø ≤ 12mm) with / without fibre cables			E 60 U/C EI 60 U/C

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ETA 18-0897
0761 - CPR - 0741

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Non-insulated metal pipes	Copper pipes up to a max. outer diameter of 28mm	Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 144mm	E 60 C/U EI 60 C/U
	Steel pipes up to a max. outer diameter of 35mm			E 60 C/U EI 60 C/U
Pre-insulated metal pipes	WICU Frio pipes up to a max. outer diameter of 22mm			E 60 C/U (1) EI 60 C/U (1)
	WICU Clim pipes up to a max. outer diameter of 22,22mm			E 60 C/U (1) EI 60 C/U (1)
	WICU Flex pipes up to a max. outer diameter of 22mm			E 60 C/U (1) EI 60 C/U (1)
	WICU Eco pipes up to a max. uter diameter of 35mm			E 60 C/U (2) EI 60 C/U (2)
	Tubolit Split / Duosplit pipes up to a max outer diameter of 12.7mm			E 60 C/U EI 60 C/U
	Tubolit Split / Duosplit pipes uo to a max. outer diameter of 22,22mm			E 60 C/U EI 60 C/U
Insulated metal pipes	Mineral wool insulated metal pipes up to a max. outer diameter of 54mm			E 60 C/U EI 60 C/U
	Mineral wool insulated steel pipes up to a max. outer diamter of 88.9mm			E 60 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 168.3mm			E 60 C/U EI 60 C/U
	AF / Armaflex (thickness 9mm) insulated metal pipes up to a max. outer diameter of 54mm			E 60 C/U EI 60 C/U
	AF / Armaflex (thickness > 9mm insulated metal pipes up to a max. outer diameter of 88.9mm			E 60 C/U EI 60 C/U

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Plastic pipes / tubes	SC-SH-16/E30, SC-SH-18/E30 and SC-SH-20/E30 (drain hose) up to a max. outer diameter of 28mm	Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 144mm	E 60 U/U EI 60 U/U
	Plastic pipes up to a max. outer diameter of 50mm			E 60 U/C EI 60 U/C
	Plastic pipes up to a max. outer diameter of 110mm			E 60 U/U (3) EI 60 U/U (3)

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

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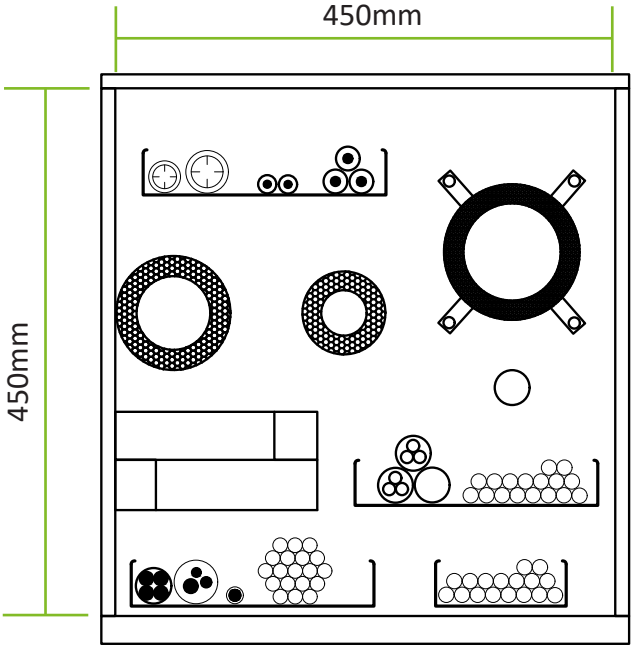
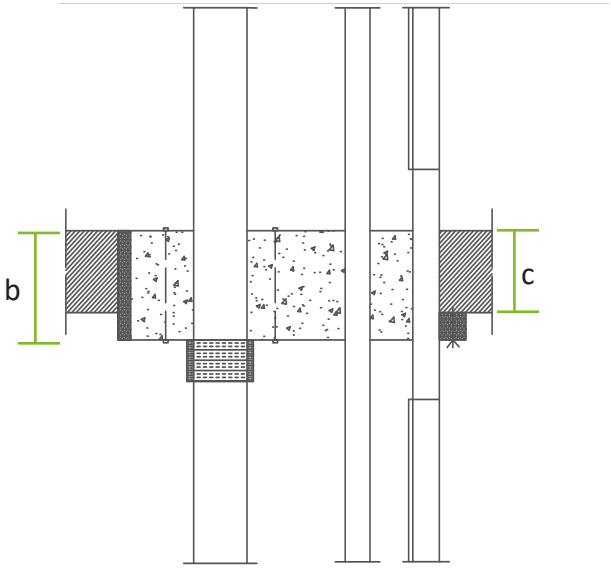
Performance Data - Floor

ETA 18-0897
0761 - CPR - 0741

PyroSeal Installation Guidance Drawing for Floor





	Penetrating Service	Aperture	Min. thickness of mixed penetration seals	Classification
Cables	Sheathed electrical / telecommunication / optical fibre cables up to a maximum outer diameter of 80mm	(c) Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 200mm	E 120 EI 90
	Tied bundles up to 100mm overall diameter containing sheathed electrical / telecommunication / optical fibre cables up to a max. outer diameter of 21mm			E 120 EI 90
	Non-sheathed cables up to a maximum outer diameter of 24mm			E 120 EI 60
Conduits / tubes	Steel conduits / tubes up to Ø 16mm with / without cables			E 120 U/U EI 90 U/U
	Plastic conduits / tubes up to Ø 16mm with / without cables			E 120 U/U EI 120 U/U
	Plastic conduits up to Ø 40mm and bundles up to Ø 80mm consisting of plastic conduits (Ø ≤ 40mm) with / without cables			E 120 U/U EI 120 U/U
	Plastic conduits up to Ø 40mm and bundles up to Ø 100mm consisting of plastic conduits (Ø ≤ 63mm) with / without cables			E 90 U/C EI 90 U/C
	Speed Pipe up to Ø 12mm and bundles up to Ø 80mm consisting of speed pipe (Ø ≤ 12mm) with / without fibre cables			E 90 U/C EI 90 U/C

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

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Performance Data - Floor

ETA 18-0897
0761 - CPR - 0741

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Non-insulated metal pipes	Copper pipes up to a max. outer diameter of 28mm	(c) Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 200mm	E 120 C/U EI 90 C/U
	Steel pipes up to a max. outer diameter of 35mm			E 90 C/U EI 90 C/U
Pre-insulated metal pipes	WICU Frio pipes up to a max. outer diameter of 22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Clim pipes up to a max. outer diameter of 22,22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Flex pipes up to a max. outer diameter of 22mm			E 120 C/U (1) EI 90 C/U (1)
	WICU Eco pipes up to a max. outer diameter of 35mm			E 90 C/U (2) EI 90 C/U (2)
	Tubolit Split / Duosplit pipes up to a max. outer diameter of 12.7mm			E 120 C/U EI 120 C/U
	Tubolit Split / Duosplit pipes up to a max. outer diameter of 22,22mm			E 120 C/U EI 90 C/U
Insulated metal pipes	Mineral wool insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 88.9mm			E 120 C/U EI 120 C/U
	Mineral wool insulated steel pipes up to a max. outer diameter of 168.3mm			E 90 C/U EI 90 C/U
	AF / Armaflex (thickness 9mm) insulated metal pipes up to a max. outer diameter of 54mm			E 120 C/U EI 90 C/U
	AF / Armaflex (thickness > 9mm insulated metal pipes up to a max. outer diameter of 88.9mm			E 120 C/U EI 120 C/U

Penetrating Service		Aperture	Min. thickness of mixed penetration seals	Classification
Plastic pipes / tubes	SC-SH-16/E30, SC-SH-18/E30 and SC-SH-20/E30 (drain hose) up to a max. outer diameter of 28mm	(c) Floor 150mm thickness (max. opening size of 450mm x 450mm)	b ≤ 200mm	E 90 U/U EI 90 U/U
	Plastic pipes up to a max. outer diameter of 50mm			E 120 U/U EI 120 U/U
	Plastic pipes up to a max. outer diameter of 110mm			E 90 U/U (3) EI 90 U/U (3)

1. PyroSeal Wrap has to be applied on both surfaces of the wall or top surface of floor.

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Performance Data - Wall and Floor

ETA 18-0897
0761 - CPR - 0741

	b ≥ 100mm	b ≥ 144mm	b ≥ 200mm	b ≥ 250mm
Sheathed electrical / telecommunication / optical fibre cables up to maximum outer diameter of 21 mm	E 120 EI 60	wall: E 120 / EI 120 floor: E 120 / EI 90	E 120 EI 120	E 120 EI 120
Sheathed electrical / telecommunication / optical fibre cables up to maximum outer diameter of 21 mm < Ø ≤ 50mm	wall: E 120 EI 45 EI 60 (1)	E 120 EI 60	E 120 EI 90 EI 120 (2)	E 120 EI 120
Sheathed electrical / telecommunication / optical fibre cables up to maximum outer diameter of 50 mm < Ø ≤ 80mm	-	E 120 EI 60	E 120 EI 90 EI 120 (2)	E 120 EI 90
Tied bundles up to 100mm overall diameter containing sheathed electrical / telecommunication / optical fibre cables of a max. diameter up to 21mm	-	E 120 EI 60	E 120 wall: EI 90 floor: EI 90 / EI 120 (2)	E 120 wall: EI 90 floor: EI 120
Non-sheathed cables up to a maximum outer diameter of 24mm	-	E 120 wall: EI 45 floor: EI 30	E 120 wall: EI 90 floor: EI 60	E 120 wall: EI 90 floor: EI 60
Steel conduits / tubes up to Ø 16mm with / without cables	-	E 120 U/C EI 60 U/C	E 120 U/U wall: EI 120 U/U floor: EI 90 U/U	E 120 U/U wall: EI 120 U/U floor: EI 120 U/U
Plastic conduits up to Ø 16mm with / without cables	-	E 120 U/C EI 120 U/C	E 120 U/U EI 120 U/U	E 120 U/U EI 120 U/U
Plastic conduits up to Ø 40mm and bundles up to Ø 80 mm consisting of plastic conduits (Ø ≤ 40mm) with / without cables	-	E 120 U/C EI 120 U/C	wall: E 120 U/C EI 120 U/C floor: E 120 U/U EI 120 U/U	wall: E 120 U/C EI 120 U/C floor: E 120 U/U EI 120 U/U
Plastic conduits up to Ø 63mm and bundles up to Ø 100mm consisting of plastic conduits (Ø ≤ 63mm) with / without cables	-	wall: E 120 U/C EI 120 U/C floor: E 90 U/C EI 90 U/C	wall: E 120 U/C EI U/C floor: E 90 U/C EI 90 U/C	wall: E 120 U/C EI 120 U/C floor: E 90 U/C EI 90 U/C
Speed Pipe up to Ø 12mm and bundles up to Ø 80mm consisting of speed pipe (Ø ≤ 12mm) with / without optical fibre cables	-	wall: E 120 U/C EI 120 U/C floor: E 90 U/C Ei 90 U/C	wall: E 120 U/C EI 120 U/C floor; E 90 U/C EI 90 U/C	wall: E 120 U/C EI 120 U/C floor: E 90 U/C EI 90 U/C

1. A bead of PyroSeal 2K Expanding Sealer with min. dimension of 30mm x 20mm (length x thickness) has to be applied around the penetrating element on both sides of the penetration seal.

2. PyroSeal Wrap has to be wrapped around the penetrating elements.

Extended Scope of Works

ETA 18-0897
0761 - CPR - 0741

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 conside 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

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