

# FF109 Pipe Fire Sleeve (PFS)

Tenmat's FF109 PFS, Pipe Fire Sleeves are designed to reinstate the fire resistance performance of wall and floor constructions where insulated metal or plastic pipes have been installed.

## Product Description

The FF109 Pipe Fire Sleeves (PFS) are a range of passive fire protection penetration seals designed to firestop insulated metal and combustible plastic pipes.

The Fire Sleeves offer Fire, Acoustic, Thermal and Vapour seal performance to a range of pipes passing through various wall or floor constructions.

The CE Marked range are fire tested in accordance with EN 1366-3 with additional testing and assessments to BS 476 Part 20.

The FF109 Pipe Fire Sleeves (PFS) are manufactured from a unique, low smoke, zero halogen intumescent material. The Fire Sleeves are supplied pre-formed and ready to install to suit a variety of pipe diameters.

With a nominal thickness of 25mm, the compressible intumescent sleeve is supplied wrapped in a reinforced aluminium foil allowing it to be cut down its length and retro-fitted around the pipes. This provides an effective fire, smoke and acoustic seal whilst also allowing for some thermal movement. Fire Ratings of EI30, EI60, EI90, EI120 or even up to EI240 minutes are offered depending on the construction type.

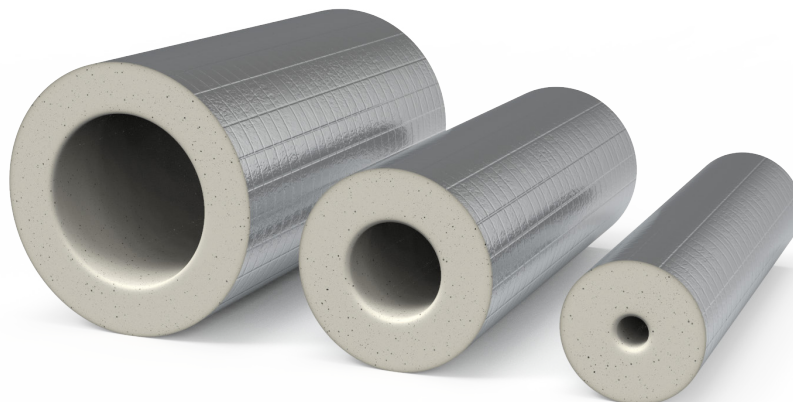
## Product Advantages

- CE Marked
- 4-in-1 Solution - Fire, Acoustic, Thermal and Vapour Seal
- Up to EI120 Minutes Fire Rating in Gypsum Walls and Solid Floors
- Up to EI240 Minutes Fire Rated in Solid Walls
- Suitable for both Metal and Plastic Pipes
- Assessed for use in Ablative Coated Mineral Wool Boards/ Batts
- Simple & quick to install, no fixings or sleeving required
- Available to suit pipe diameters of 15mm to 169mm
- 1 length of Fire Sleeve can replace two fire collars
- Lubrizol Approved
- FBC™ System Compatible

## Dimensions

Fire Sleeve Internal Diameter ID (mm)	For Pipes with Nominal Outside Diameter OD (mm)	Nominal Thickness of Sleeve (mm)	Nominal Outside Diameter / Recommended Aperture (mm)	Standard Fire Sleeve Length
17	15-19	25	67	300
21	19-23	25	71	300
27	25-29	25	77	300
34	32-36	25	84	300
42	40-44	25	92	300
48	46-50	25	98	300
54	52-56	25	104	300
60	58-62	25	110	300
67	65-69	25	117	300
76	74-78	25	126	300
80	78-82	25	130	300
89	87-91	25	139	300
102	100-104	25	152	300
108	106-110	25	158	300
114	112-116	25	164	300
127	125-129	25	177	300
134	132-136	25	184	300
140	138-142	25	190	300
159	157-161	25	209	300
160	158-162	25	210	300
169*	162-165	25	219	300

\*BS 476 tested only



## Technical Details

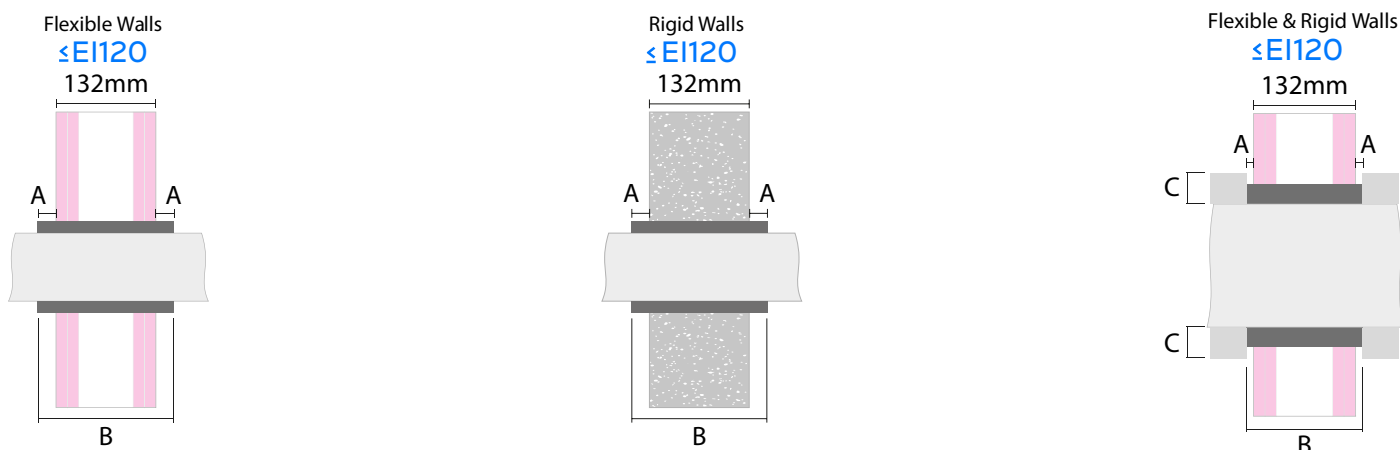
Material	FF109
Colour	Grey
Finish	Aluminium Foil
Density	200 Kg/m <sup>3</sup>
Free Expansion Ratio	5:1
Activation Temperature	180 °C

## Storage &amp; Durability

Storage	Dry, ambient
Transportation storage temperature	-20°C to +70°C
Working life	>50 years
Durability	Type X intended for use in conditions exposed to weather (UV, rain, frost)
Halogen Content	Low
Smoke emission	Low
Material Compatibility	Compatible with common pipe materials including Copper, Steel, PVC, CPVC, PE FBC™ System Compatible



### Installation Variations



Test Standard	Pipe Size Range (mm)	Pipe Wall Thickness (mm)	Material	Min. Protrusion "A" (mm)	Min. Sleeve Length "B" (mm)	Pipe Insulation* Required	Fire Rating	End Cap Configuration	Report No.
EN 1366-3	15	1-14.2	Copper, Cast Iron, S/Steel, M/Steel	9	150	Y	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-159	2-14.2	Copper, Cast Iron, S/Steel, M/Steel	9	150	Y	EI20/EI30	U/C, C/C	ETA 20-1164
EN 1366-3	15-43	1.8-3.2	PVC-U / PVC-C	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-82	3.2	PVC-U / PVC-C	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-110	3.2	PVC-U / PVC-C	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	160	3.2	PVC-U / PVC-C	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-40	3.0-4.3	PE, ABS, SAN+PVC	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	90	3.5	PE, ABS, SAN+PVC	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-110	4.3	PE, ABS, SAN+PVC	24	180	N	EI120	U/C, C/C	ETA 20-1164
EN 1366-3	15-160	6.2	PE, ABS, SAN+PVC	24	180	N	EI90	U/C, C/C	ETA 20-1164

Test Standard	Pipe Size Range (mm)	Pipe Wall Thickness (mm)	Material	Construction Type	Min. Protrusion "A" (mm)	Min. Sleeve Length "B" (mm)	Pipe Insulation* Required	Fire Rating	End Cap Configuration	Report No.
EN 1366-3	15-110	3.2	PVC-U / PVC-C	Solid Wall Only Min. 150mm	0	150	N	EI240	U/C, C/C	ETA 12/0332

Service Support must be max. 150mm from the surface of the wall

Seals must be minimum 200mm apart

The seal must be friction fitted within an aperture nominally 50mm larger than the outside diameter of the pipe For flexible walls constructed with steel studs then the wall can be fitted with or without cavity insulation

Rigid Walls must comprise concrete, aerated concrete or masonry with a minimum density of 650 kg/m<sup>3</sup> (wall type A, see ETA) or concrete or masonry with a minimum density of 1100 kg/m<sup>3</sup> (wall type B).

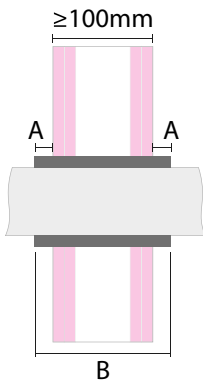
If the wall is thicker than 132mm the seal must be longer to maintain the 24mm protruding from each face PE includes PE-LD, PE-MD, PE-HD, PE-X according to EN 12201-2, EN 1519-1 or EN 12666-1

\* Pipe Insulation must be Rockwool Rocklap H&V Pipe Section, min. 40mm thick (dimension "c"), density 120 kg/m<sup>3</sup>, class A1/A2



Installation Variations

Flexible & Rigid Walls



Test Standard	Pipe Size Range (mm)	Pipe Wall Thickness (mm)	Material	Min. Protrusion "A" (mm)	Min. Sleeve Length "B" (mm)	Pipe Insulation Required	Fire Rating	End Cap Configuration	Report No.
EN 1366-3	32	2.9	Aquatherm Blue Pipe PP-R	25	150	N	EI120	C/C	RF15079
EN 1366-3	40	3.7	Aquatherm Blue Pipe PP-R	25	150	N	EI120	C/C	RF15079
EN 1366-3	125	11.4	Aquatherm Blue Pipe PP-R	25	150	N	EI90	C/C	RF15079

Service Support must be max. 150mm from the surface of the wall

Seals must be minimum 200mm apart

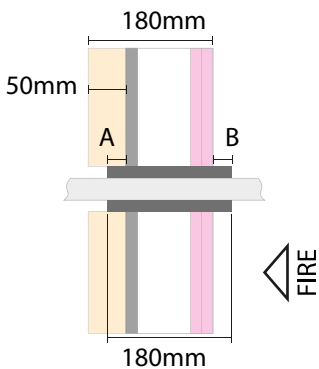
The seal must be friction fitted within an aperture nominally 50mm larger than the outside diameter of the pipe

For flexible walls constructed with steel studs then the wall can be fitted with or without cavity insulation

Rigid Walls must comprise concrete, aerated concrete or masonry with a minimum density of 650 kg/m<sup>3</sup> (wall type A, see ETA) or concrete or masonry with a minimum density of 1100 kg/m<sup>3</sup> (wall type B).

Flexible Wall (external)

EI90



Construction Build-Up

Celotex PIR Foil Faced Insulation 50mm thick / 31kg/m<sup>3</sup>

Siniat GTEC Weather Defence Board SE 1x12.5mm

Rockwool ProRox SL920 Rock Fibre Insulation 100mm thick / 45kg/m<sup>3</sup>

Metsec Steel Stud 90mm wide

Siniat GTEC Fire Board SE Plasterboard 2x12.5mm

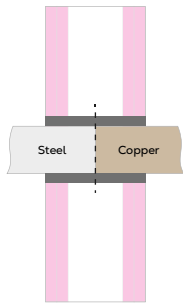
Test Standard	Pipe Size Range (mm)	Pipe Wall Thickness (mm)	Material	Min. Protrusion "A" (mm)	Min. Protrusion "B" (mm)	Min. Sleeve Length (mm)	Pipe Insulation* Required	Fire Rating	End Cap Configuration	Report No.
EN 1366-3	15-110	3.2	PVC-U / PVC-C	25	25	180	N	EI90	U/U, C/U, U/C, C/C	WF 422553
EN 1366-3	15-82	3.2	PVC-U / PVC-C	50	25	205	N	EI90	U/U, C/U, U/C, C/C	WF 422554
EN 1366-3	15-36	1.8	ABS	50	25	205	N	E90/EI45	U/U, C/U, U/C, C/C	WF 422555
EN 1366-2	15-43	1.9	ABS	50	25	180	N	EI90	U/U, C/U, U/C, C/C	WF 422555
EN 1366-3	15-55	2.0	ABS	50	25	180	N	EI90	U/U, C/U, U/C, C/C	WF 422556

Service Support must be max. 300mm from the surface of the wall

Seals must be minimum 200mm apart

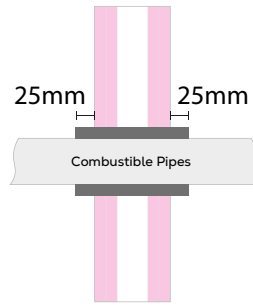
Installation Variations

120 Minute Rated Flexible or Rigid Walls



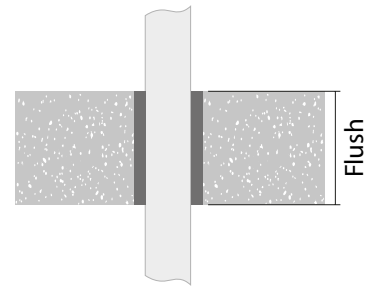
120 Minute Rated Flexible or Rigid Walls

EI120



120 Minute Rated Rigid Floors

EI120



Test Standard	Material	Pipe Size Range (mm)	Wall Thickness (mm)	Min. Protrusion in Floors (mm)	Min. Protrusion in Walls (mm)	Insulated / Uninsulated	Fire Rating		End Cap Configuration	Report No.
							Integrity	Insulation		
BS 476 Pt. 20	Steel	22-165	2.5-14.2	0	0	Uninsulated	120	0	C/C	A03187
BS 476 Pt. 20	Copper	12-160	2.5-14.2	0	0	Uninsulated	120	0	C/C	A03187
BS 476 Pt. 20	Polybutylene	Dec-28	2-3.5	0	0	Uninsulated	120	120	C/C	A03187
BS 476 Pt. 20	PVC	55-82	3-4.2	0	25	Uninsulated	120	120	C/C	A03187
BS 476 Pt. 20	PVC	110	3.2-4.2	0	25	Uninsulated	120	60	C/C	A03187
BS 476 Pt. 20	PVC	160	3.2-4.2	0	25	Uninsulated	120	90	C/C	A03187

Rigid floors must be rated to 120 minutes fire resistance and consist of masonry (600kg/m<sup>3</sup> to 1500kg/m<sup>3</sup>), low density concrete (min. 1100kg/m<sup>3</sup>) or high density concrete (max. 2400kg/m<sup>3</sup>)

Rigid walls must be rated to 120 minutes fire resistance and consist of masonry (600kg/m<sup>3</sup> to 1500kg/m<sup>3</sup>)

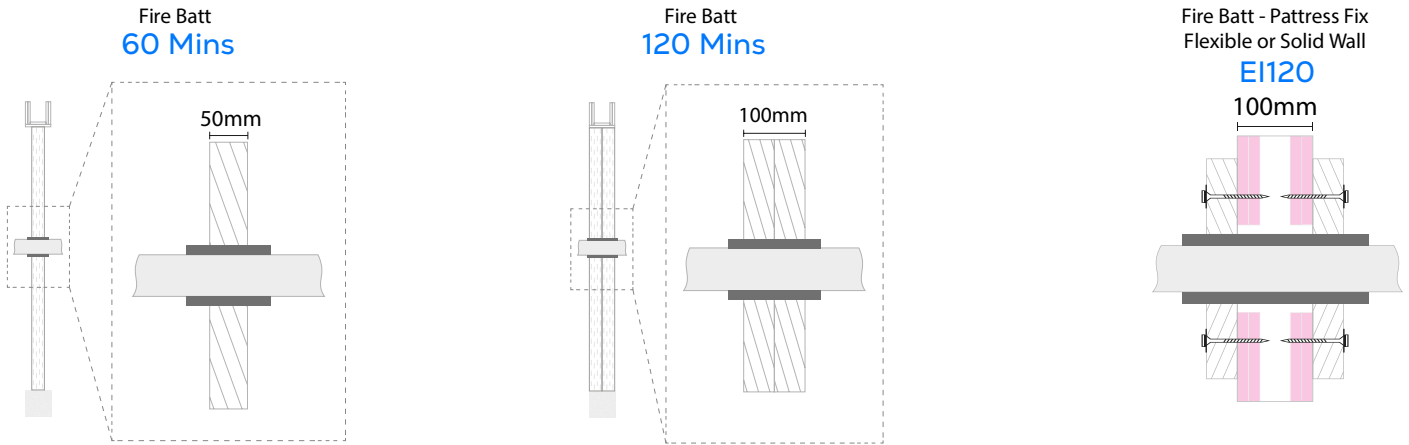
Flexible walls must be plasterboard clad steel or timber stud partitions and rated to 120 minutes fire resistance

Length of Fire Sleeve must be as per the depth of the wall or floor plus any required protrusion as stated in the table above

Please refer to Report A03187 for more information on the approved applications

Individual seal openings must be minimum 200mm apart

Installation Variations



Material	Pipe Size Range (mm)	Wall Thickness (mm)	Min. Protrusion in Single 50mm Batt (mm)	Fire Rating Single 50mm Batt		Min. Protrusion in Double 50mm Batts / Pattress Fixed (mm)	Fire Rating Double 50mm Batts		End Cap Configuration	Report No.
				Integrity	Insulation		Integrity	Insulation		
Polybutylene	2.5	15-28	40	60	60	25	120	120	U/C, C/C	PAR/13814/02
Aquatherm Blue PP-R	2.9	32.0	40	60	60	25	120	120	U/C, C/C	PAR/13814/02
Aquatherm Blue PP-R	3.7	40.0	40	60	60	25	120	120	U/C, C/C	PAR/13814/02
HDPE	3.0	40.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
PVC-U	1.8	43.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
PVC-U	2.0	55.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
HDPE	2.3	56.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
ABS	4.0	57.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
PVC-U	3.2-4.0	82.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
HDPE	3.5	90.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
PVC-U	3.2-4.0	110.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
HDPE	4.3	110.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
ABS	5.0	110.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
Aquatherm Blue PP-R	11.4	125.0	40	60	60	25	90	90	U/C, C/C	PAR/13814/02
PVC-U	3.2-4.5	160.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
HDPE	6.2	160.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02
ABS	6.7	160.0	40	60	30	25	120	120	U/C, C/C	PAR/13814/02

Above Fire Ratings are maximum possible fire ratings dependent upon the configuration of Coated Batt Installation. See table on the next page. The lower fire rating in the above or next table takes precedent.



## Installation Variations

Configuration and Thickness of Coated Batt System	Construction Type*	Integrity (minutes)	Insulation (minutes)	Maximum aperture dimensions (mm x mm)
Single 50 In-Plane	BCM	120	60	1200x600
Single 50 + local 50 pattress	BCM	120	60	1200x600
Twin 50 In-Plane	BCM	120	120#	1200x600
Twin 50 Pattress	BCM	120	120	1000x1000
Single 50 In-Plane	PSP	60	60	1200x600
Twin 50 In-Plane	PSP	30	30	800x600
Twin 50 In-Plane	PSP	60	60	800x600
Twin 50 In-Plane	PSP	120	60	600x535
Twin 50 Pattress	PSP	120	120	1000x1000

Key:

BCM = Blockwork, Concrete or Masonry Wall

PSP = Plasterboard steel stud partition

# = Insulation of Coated Batt system reduced to 90 minutes if Coated Batts installed without 50mm air-gap

\* = Refer to Construction Notes in PAR13814/02 regarding specification for walls/partitions

Ablative Coated Batts must be either PFC Corofil or Rockwool Coated Batt Systems only

Fire Rated Acrylic Intumescent Sealants used must be either PFC Corofil or Rockwool depending on which Batt system is being used

Minimum Protrusion must be both sides of the wall

Min. spacing to seal edge or between penetrations must be 50mm

For Pattress Fix solutions there must be a minimum of 100mm overlap to the wall

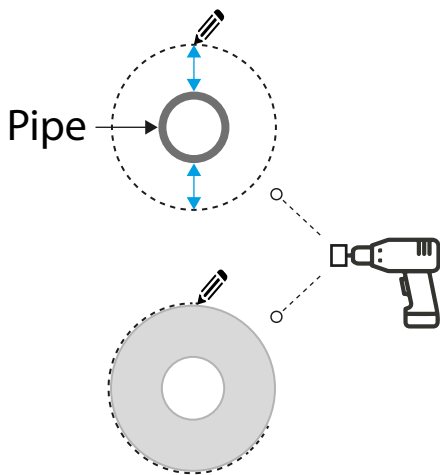
Fire Sleeves should be installed to ensure a close fit within the Ablative Coated Batts

Service Supports must be max. 150mm from the surface of the wall

Individual seal openings must be minimum 200mm apart

Please refer to PAR/13814/02 for details

## Fitting Instructions

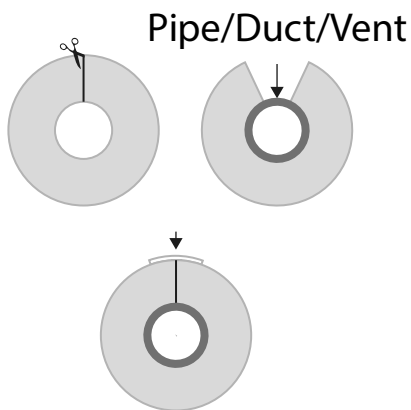


### Step 1a

If using a hole cutter for circular holes, ensure that the correct fire sleeve wall thickness (25mm + 25mm) 50mm total is added to the diameter of the pipe, this equals the aperture size. Cut the hole through the substrate using the correct blade, in the required location.

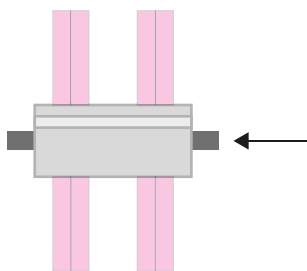
### Step 1b

If cutting without a hole cutter, using a pencil, draw around the fire sleeve at the required position of the aperture, ensure a tightly marked line. Use this line to cut the aperture through the substrate, using the required equipment as appropriate.



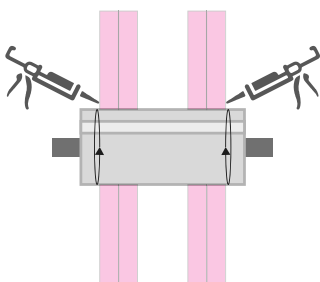
### Step 2

Unless the sleeve can be slid down the length of pipe/vent/duct to the aperture, carefully cut along the length of the fire sleeve, using a sharp knife or scissors, on a rectangular duct/vent cut centrally to one of the sides, place the sleeve around the pipe/duct/vent close to the aperture, and apply foil tape over the joint, where the sleeve was cut.



### Step 3

Push gently on the sleeve to pass it through the wall, if the sleeve covering starts to tear or if excessive resistance is felt, pull the sleeve back and trim the aperture. The sleeve should be pushed into the required position, ensuring that the required length of sleeve protrudes on either side of the wall.



### Step 4 (If required)

If required for the purpose of smoke and draft stop, air or water tightness and airborne sound insulation, the gap between opening edge and fire sleeve may be sealed off by a suitable acrylic intumescent mastic construction sealant approved for penetration sealing applications.

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### Tools / Fixings

- Knife
  - Aluminium foil repair tape
  - Hole cutting tools as required for substrate
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### Intended Use

Around pipes used for the movement of foul or clean water, hot water and cold water.

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### Maintenance

No active maintenance required, where alterations are made around the product it should be checked visually to ensure that the product is still installed as per fitting instructions and tested systems.

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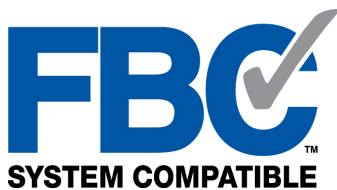
### Storage

Both un-cut and cut products should be packed to prevent movement and abrasion during transit and to prevent absorption of water. Otherwise normal safe precautions for storage can be used. To avoid damage and distortion, store on a smooth level surface, in a fully supported position off the ground and in a dry place.

FF109 is packed in card cartons and is not considered to be a dense material, but care should be taken not to exceed safe working loads for equipment and storage shelves or racks.

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Tenmat warrants the materials it produces will conform to Tenmat specifications and approved drawings where applicable. It is entirely the customer's responsibility to make the final product choice and satisfy themselves of the suitability of the product for the intended application, carrying out testing where required. For construction projects, all products which the customer is intending to use on a particular project must be approved in writing by the customer's building designer, system designer or design control professional, to ensure compliance with the latest regulations.

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