



# Thermofol Single Ply

## Installation Guide





# Bauder Thermofol PVC Installation Guide

This guide describes the correct installation of the Bauder Thermofol PVC waterproofing system for flat roofs.

## PREREQUISITES

1. This guide must be read in conjunction with the NBS Single Ply Specification to confirm the products used and installation method, and the project tapered insulation scheme layout where appropriate. **Understanding of Section 1 Principles is mandatory.**
2. Operatives carrying out heat welding of this single ply membrane **MUST** hold a Thermofol PVC Installer Card.
3. The Bauder waterproofing system **MUST** undergo a successful final inspection and be signed off on completion.
4. Workmanship should comply with current Codes of Practice, BS 6229 and Bauder Ltd installation instructions.

## CONDITIONS

The Bauder Guarantee may not be issued if:

1. There is no safe access to inspect the roof area(s).
2. The waterproofing fails to meet final inspection standards.
3. Any specified component is substituted for an equivalent without the written authority of Bauder Ltd.

The information within this guide observes the standards and guidelines from BS 6229:2018 and SPRA. This document is correct at the time of publication; however, confirmation should be sought from the correct authority if using the quoted standards in this document.

## TECHNICAL SUPPORT

If you require support or advice on the Bauder Thermofol PVC system or products within the specification, please contact:

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■ Chris Lee	Product Manager	07590 964784
	Single Ply Systems	
■ Technical Department	Head Office	01473 257671

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# 1 Principles

## 1.1 Membrane overview

The Bauder Thermofol membranes are polyester reinforced Polyvinyl Chloride (PVC). The internal plasticisers incorporated during their manufacture give high flexibility, high tensile strength, good thermal stability, and chemical resistance.

### ■ Thermofol U12 / U15 / U18/ U20

1.2 / 1.5 / 1.8 / 2.0mm gauge thickness reinforced membranes primarily employed on mechanically fastened installations, although can be adhered or loose laid ballasted under certain circumstances.

### ■ Thermofol U15 FB

3.5mm factory-applied fleece-backed membrane (● including 2.0mm fleece) primarily employed in adhered installations.

### ■ Thermofol D18

System supplement, 1.8mm un-reinforced detailing membrane.

### ■ Thermofol Walkway

Dark grey, embossed, reinforced, 2.0mm thick walkway membrane gives access route definition. Walkway can be loose-laid or adhered with Thermofol Contact Adhesive-Red over the finished membrane surface. It must always be heat welded around its full perimeter to the surface of the finished waterproofing.

Thermofol membrane	Roll size (m)	Roll weight (Kg)	Thickness (mm)	Colour		
				Light Grey (RAL 7035)	Blue Grey (RAL 7031)	Anthracite (RAL 7016)
U12	1.5 x 20	42 ♦	1.2	✓	X	X
U15		54 ♦	1.5	✓	✓	✓
U18		65 ♦	1.8	✓	✓	✓
U20		72 ♦	2.0	✓	X	X
U15 FB		60 ♦	3.5 ●	✓	✓	✓
D18	0.5 x 10	9	1.8	✓	✓	✓
Walkway	0.75 x 20	36 ♦	2.0	Dark Grey (RAL 7012)		

- ♦ **Health and Safety requirement** - The guidelines suggest that the maximum weight a man should lift at work is 25kg

# Principles

## 1.2 Membrane compatibility

To ensure the maximum working life for the Bauder Thermofol PVC materials it is essential that they are separated from contact with incompatible materials.

Do not store or place on or near, or install membranes where they will encounter:

- Bitumen
- Oil
- Asphalt
- Hydrocarbons
- Fats and cooking oils
- Fibre glass
- Rubber-based products
- Other single ply membranes

A suitable separation fleece must be employed to ensure contact with incompatible products is negated, see Sections 7.1 and 7.2. Alternatively, Thermofol U15 FB can be used as the polyester fleece backing provides the necessary underside protection.

Refer to specification for Profiled EPS Overlay System, which utilises polystyrene insulation, a GV120 separation fleece is required between the insulation and the non-fleece backed Thermofol membrane in mechanically fastened membrane applications.

If you have any concerns of an incompatible product coming into contact with the Thermofol PVC membrane, consult the Bauder Technical Dept Helpline 01473 257671.

# 1 Principles

## 1.3 Delivery and storage

Check delivery upon receipt of the goods against the delivery note. Bauder will not be liable for further costs in the case of subsequent deliveries if you later discover that any material is missing/damaged.

**Bauder Thermofol Membrane** - Thermofol membrane should be stored in a dry condition and, where possible, in its original packaging.

Thermofol is supplied on wooden pallets. Rolls should be stored in a way which does not allow the roll to deform, as this may affect the initial aesthetic appearance of the product. The storage time of the membranes is unlimited provided they are stored in suitable conditions.



**Bauder Insulation** - The packaging of Bauder insulation products should not be considered adequate for outside protection. Ideally, boards should be stored inside a building. If outside storage cannot be avoided the boards should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin.

Boards that have been allowed to get wet must dry naturally before being used.



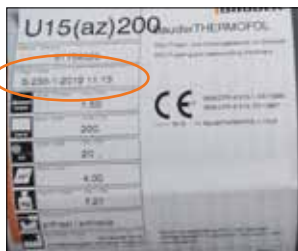
**Adhesives and Primers** - All adhesives should be kept in a secure storage cage, in a dry condition at a temperature stated on the Product Data Sheet and/or Safety Data Sheet to ensure the stated shelf-life.

**Note:-** Products will have limited life once containers are opened.



## 1.4 Packaging and labelling

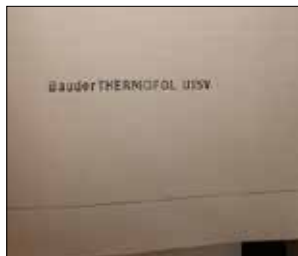
Every Thermofol membrane roll will have a label which includes key information about the membrane (width, length, thickness, weight, and colour); importantly it also includes the production batch number highlighted in the image. The batch number is important for identifying and cross referencing against samples of the same batch held in our manufacturing locations should it be required.



## 1.5 Membrane markings

Thermofol roofing membranes have printing on the upper surface to identify the product name, and markings showing a lap indicator line to aid positioning the fastenings for the seam in a mechanically fixed installation.

All Bauder Thermofol products are compatible and weldable with each other.



# 1 Principles

## 1.6 Installation precautions

- **Cutting products** should only be carried out on a cutting board or scaffold plank to protect the waterproofing system already installed.
- **Hot works permit** may be required for hot air welding of the membranes.

## 1.7 Kit list

### Documentation

- NBS Single Ply Specification
- CAD detail drawings
- Tapered insulation scheme layout for the project, where appropriate
- Wind load calculation report

### Basic set of tools

- Silicon roller
- Penny roller
- Engineers square
- Tape measure and pencil
- Stanley knife & scissors – use suitable PPE
- Probes
- Hammers
- Wire brush



## Welding equipment

- PID Hot air hand gun and nozzles
  - 40mm straight nozzle - side and head laps
  - 20mm straight nozzle - detailing
  - 20mm bent/angled nozzle - detailing
  - Cord nozzle - PVC peel stop cord



- Automatic welding machine with digital display and control or continuous control. We strongly recommend this is always used for application areas more than 100m<sup>2</sup>.



Hot air welding equipment is available for purchase or hire from the below company:

**LEISTER**

**Welwyn Tool Group**

T: 01707 331111

[www.welwyntoolgroup.com](http://www.welwyntoolgroup.com)

# 1 Principles

## 1.8 Adhesives (where specified)

- Use the correct adhesive as per specification along with the correct associated tooling, such as guns, hoses, rollers etc.
- Information regarding handling, storage and disposal of adhesive containers can be found on the latest version of the product Safety Data Sheet, which must be consulted before use.
- When using canisters, set up as described in the Bauder Canister Set-Up and Maintenance Guide.

## 1.9 Fasteners for mechanically fixed installations

- Bauder approves the use of fasteners for mechanical attachment of Thermofol membrane and insulation from suppliers who are current members of SPRA.
- The correct selection of the fastener type is the responsibility of the contractor and fastener supplier to achieve the applicable warranty in-line with the expected duration of the Bauder guarantee to be issued.
- **Only fasteners supplied by SFS are included within the Bauder Guarantee.**
- The pull-out test must be carried out by an engineer from the chosen fastener supplier with successful completion if the Bauder guarantee is to be issued.
- Fasteners should be installed according to the results of the pull-out test or to the Bauder specification to ensure the condition and suitability for mechanical restraint, particularly to negate wind uplift loads.



## 1.10 Protection of finished work

Once an area of roof has been completed it should be signed off and access to it denied to all, except the Roofing Contractor, to minimise the opportunity of damage from following trades.

If access cannot be denied, the roof should be protected from damage by laying a separation fleece of PF300 MF and sheets of plywood or OSB on top of the protection layer, see Chapter 7. Care must be taken when placing the boards, so the corners do not damage the membrane or underlying insulation. Consideration is required to retain the boards in place against wind load uplift forces.

Completed roof areas **SHOULD NOT** be used for storage as this presents a high risk of damage and the items could additionally exceed the load capability of the roof.

## 1.11 Recycling and disposal of waste

### Canister adhesives & primers

- Once canister is no longer expelling adhesive or primer then transfer the hose and gun to a new canister. Open the valve on the new canister and purge the adhesive/primer through the hose and gun.
- Open the valve at the top of the used canister and empty any remaining adhesive/primer and propellant into a suitable container.
- Ensure the valve remains open. Leave for at least 1 hour.
- Use a non-ferrous rod and mallet to strike the bursting disk at its perimeter.
- Remove the disk, which will reveal an aperture. This will ensure that the canister remains depressurised.
- Leave for 24 hours to allow any residue adhesive/primer to dry and/or cure.
- After the above procedure has been followed, the canister will be empty of any hazardous materials and depressurised. Therefore, it can be considered as scrap metal in accordance with the national or local waste company, under code EWC 150104 (empty aerosol, no hazardous residues).
- Canisters that are still pressurised and contain adhesive/primer should be disposed of in accordance with the national or local waste company under code EWC 160504 (full or partially empty aerosol).

### Drum or tin adhesives

- Empty containers should be treated as controlled waste. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

### PVC membranes

- Thermofol membrane can be sent for disposal with household waste. EWC Code: 57 116 (Comply with local authority regulations).
- *Recycling of membrane at the end of working life may be possible. Contact Bauder for more information.*

- Thermofol membrane rolls are wrapped in protective paper and each roll has a cardboard core for stability.

Full pallets have further wrapping and will also have nylon straps to ensure stability of the rolls in transit.

It is important that protective strapping and wrapping is kept in place until the membrane is about to be installed.

- All packaging waste is recyclable.

## 2 Hot air welding - lap connection

All the membrane laps must be welded together using hand-held tooling or automatic trolley machines to create, from the individual sheets, one homogeneous single layer of waterproofing across the whole roof.



**Peel Bond Weld Test** - must always be carried out, recorded and retained for future reference: (see Section 2.5)

- Before the welding commences on each day.
- In changeable site or weather conditions.
- To verify that a lap cleaning schedule has proven to be adequate.

### Lap and welding technical information

Normal welding temperature:

- Hand welder 430 - 500°C
- Trolley welder 480 - 580°C

Lap sizes:

- Total side overlap: 100mm for mechanically fastened membrane 60mm for adhered and ballasted membrane
- Head laps: 100mm, non FB membrane

Final weld dimension:

- 30 - 40mm

Weld time:

- 2.5m/min (approx. with trolley welder)
- 0.4 – 0.5m/min manual welding

Nozzle sizes

- Straight welding nozzle: 40mm
- Detailing Nozzle: 20mm



## 2.1 Welding preparation

- Check all surfaces to be jointed are clean, dry and free from dirt. Refer to Section 3.2 for cleaning instructions.
- Test electrical supply and welding equipment.
- Prepare equipment (refer to Section 1.7) for the work schedule and welding techniques planned. The following is recommended:

**Side laps:** Leister Varimat 240V/4600W with a 40mm nozzle (trolley mounted, automatically driven).



**Head laps and detailing:** Leister Triac PID 110V/1600W hand tool fitted with 40mm left or right-handed nozzles.



**Fine detailing:** Leister Triac PID 110V/1600W hand tool fitted with 20mm left or right-handed nozzles.



## 2.2 Manual welding

This is a three-stage process with a tack weld, pre-weld, and finishing weld for mechanically fastened systems and two stage process for adhered with a pre-weld and finishing weld.



### Ensure required overlaps are allowed for:

Side laps	100mm mech fix	60mm adhered or ballasted
Head/End laps	100mm	

**IMPORTANT** Keep weld zone cleared of adhesive

### Mechanically fastened systems

Ensure the membrane is positioned, appropriately mechanically fixed, and any creases removed from the surface prior to starting.

**Adhered systems** – Ensure the membrane is suitably adhered prior to starting the two-stage weld process.

### Step 1 Tack weld

- Visually identify the width of the weld zone as tack welding is carried out within the pre-weld zone.
- Fix the membrane with tacking dots, using light hand pressure, at 2m centres to assist with the tensioning and removal of any creases.
- Further tack the membrane between these first tacking dots, now at intervals of 40-50cm.

**Tack weld** stabilises the membrane for mechanically fixed systems.

**Pre-weld** for all installations, creates a 'pocket' to retain the hot air/temperature beneath the sheet rather than dissipating for the final weld operation.

**Final weld** for all installations, completes the weld process to ensure a watertight, homogenous seam.



### Step 2 Pre-weld

- Visually identify the pre-weld area 60mm inside the final weld area to ensure 40mm remains for the final welding operation.
- Place the nozzle in the lap at 45° to the membrane seam and the roller above the lap maintaining a 20-30mm gap between the nozzle and the pressure roller. Move both the hot air welder and the roller at the same pace, roller following the welder.
- Fluidly pass the pressure roller evenly over the entire weld to create a continuous weld.
- Pre-weld the full length of the seam.



### Step 3 Final weld

- Repeating the pre-weld technique, create a continuous weld to the remaining 40mm lap 'pocket' for the entire length of the seam.
- Indicators of a successful final weld: wide weld bead, strong area of shine next to the weld, slight smoke build-up.



## 2.3 Automatic welding – for side laps in the roof field areas

- Start on a new roll of membrane (default for Varimat V2).
- Parameters for automatic welding: 480 to 580 °C.
- Target speed: Dependent upon the individual machine, power supply and weather. Likely between 2.0 - 4.5 m/min.
- Adapt the welding process to the weather and power supply conditions during welding. Consideration must be given to the length of any cable run and its impact on the final voltage delivery. Excessive cable runs can impact on the effectiveness of the tool to maintain correct welding.
- Always carry out a test weld. Refer to Section 2.5
- At the transition between the automatic and manual welding, pull back until you reach a secure lap connection.
- Minimum weld width is at least 30mm.



## 2.4 Weld checking laps and joints

After completion of the welding operation for each section or at the end of each day, a mechanical test should be undertaken to ensure the quality of the joints.

- Ensure the weld is sufficiently cooled down.
- Using a rounded metal single ply probe, place on the weld using medium pressure, move along the length of the seam to identify any penetration points where the probe slips between the membranes.
- Any areas found to be insufficiently jointed will require further techniques:
  - Underheated lap joint - clean and re-weld.
  - Overheated lap joint - weld a patch of material over this area as it is not possible to reweld the failing seam.



## 2.5 Peel bond weld test

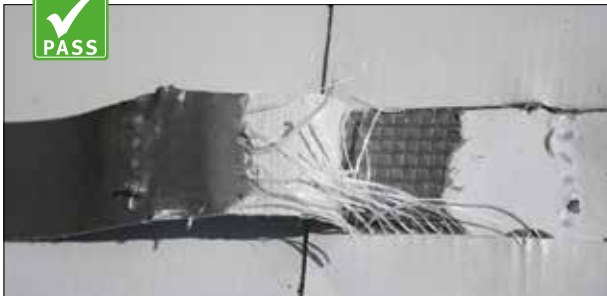
This test ensures that the welding equipment is performing as expected, adjusted if required and set according to site conditions, prior to work commencing each day.



**Test welds** - must always be carried out, recorded and retained for future reference:

- before the welding commences on each day.
- in changeable site or weather conditions.
- to verify that a lap cleaning process has proven to be adequate if necessary.
- to ensure all welding equipment is working and set correctly

- Use two clean off-cuts of the Thermofol membrane.
- Tack weld, pre-weld and final weld the two pieces together.
- Allow the test weld to cool.
- Lightly cut the topmost membrane towards the weld to gain a rectangular piece for gripping.
- Pull this rectangular top layer membrane back towards and across the weld to identify the success of a continuous homogenous join has been achieved in the final weld zone.
- The welded seam must not separate during the peeling test. Any tearing must be located either in the Thermofol membrane or within the area of the reinforcing material.
- Sign and date the peel test and keep in a secure container on site for proof of testing later, should it be required.



## 3 General preparation and setting out



Test welds should always be carried out to verify membrane welding has been successful. Refer to Section 2.5

If the membrane becomes wet or soiled after or during preparation, then refer to Section 3.2 for cleaning recommendations.



### 3.1 Cleaning the membrane

In some circumstances it may be necessary to clean the membrane for aesthetic reasons, or prior to welding, refer Section 3.2

- Apply Bauder Thermofol PVC Cleaner to the soiled area of Thermofol Membrane using a soft, clean cloth.
- Clean the membrane and wipe dry.
- If membrane is heavily soiled, wipe with plenty of PVC Cleaner and new cloth several times.





## 3.2 Cleaning the laps prior to welding

Newly unwrapped Thermofol membrane should not require cleaning prior to welding. If the seam weld area has become dirty or contaminated then this zone will require cleaning to achieve an effective, homogenous, and watertight weld.

**Building site dust and dirt or membrane left exposed overnight before welding** – use the general purpose **Thermofol PVC Cleaner** as described in Section 3.1 and ensure the weld area is dry before commencing with any hot air welding.

**Moisture exposure, aged membrane, and extensive contamination from building site dust and dirt** – use **Bauder PVC Seam Activator**.

- Apply Bauder PVC Seam Activator with a soft and clean tissue onto the welding range.
- Clean the membrane and wipe dry with lint free tissues.
- If membrane is particularly soiled, wipe several times with Bauder PVC Seam Activator and a new lint free tissue until the original membrane colour is restored.
- Allow the PVC Seam Activator to evaporate completely (5 minute ventilation period) before hot air welding is carried out.
- Carry out a successful peel bond weld test.



### IMPORTANT

- Do not use PVC Seam Activator to clean the whole membrane surface; it is only for seam preparation.

### 3.3 General laying out of the membrane sheets

The general layout of the waterproofing membrane on a project may be affected by several factors outside of the requirements for waterproofing i.e. areas of roof being ready, site set up and access.

#### **Waterproofing considerations:**

- Installation sequence to reduce the necessity for night joints and the chance of water passing under any temporary sealing into the system. Refer to Section 3.6
- Starting at the high point of the roof away from the outlets. This is a general recommendation and will be subject to site conditions.
- The deck type can affect the general layout for membranes.

**On profiled metal decking** the membrane should be laid so that the side laps run at 90° to the deck crowns.

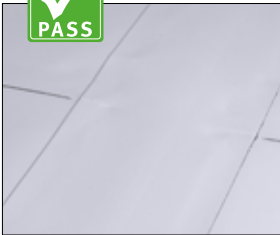
**On non-profiled decks,** the general layout of the membrane should be the most cost-effective way and where practical, in the direction of the fall.

### 3.4 Setting out the membrane to the roof field area

- Position the membrane, unroll and align it.
- Fix the end (head) of the roll and tighten it over the roof field area walking the membrane roll length using small steps.

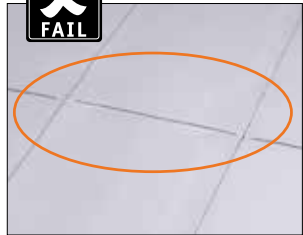


- Avoid any cross joints by offsetting the membranes. Refer to Section 3.5 if cross joints are unavoidable.



**CORRECT**

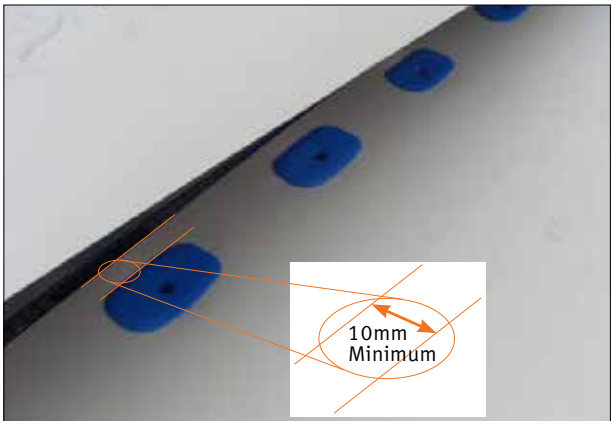
– laps staggered



**WRONG**

– head laps in alignment

- Fasteners must be positioned with a minimum space of 10mm from the edge of the membrane to the leading edge of the tube or washer plate.

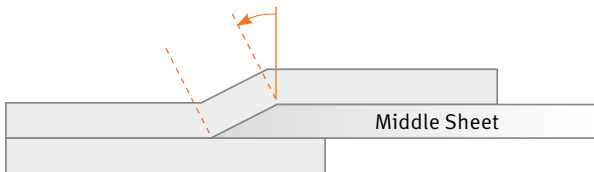


## 3.5 Cross joints or T-joints



A cross joint or 'T' joint must be sealed using a hot air gun to a minimum depth of 30mm

- For Thermofol membrane greater than 1.5mm thickness, the edge of the 'middle' sheet must be chamfered to enable the capillary to be fully sealed. This can be achieved ideally by using a chamfering tool or if necessary by using the edge of the nozzle of a hot air welding gun.



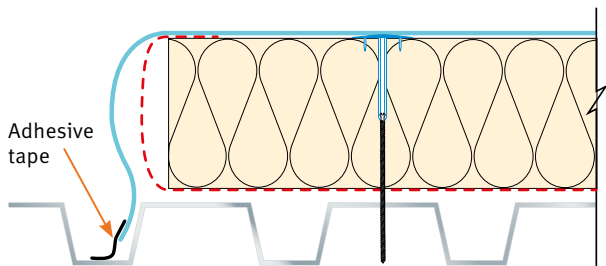


## 3.6 Night joints

Night joints are essential to prevent water penetration of an incomplete roof area at the end of a session.

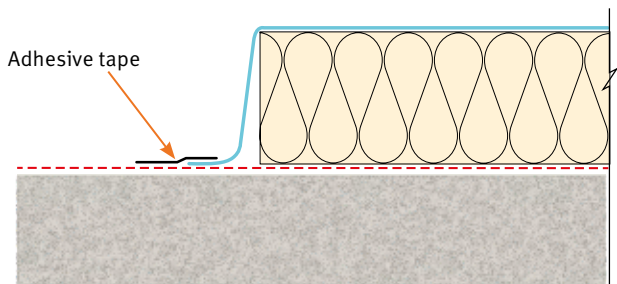
### METAL DECK

- Lift the overhanging excess Thermofol membrane and fold the air and vapour control layer up to cover the exposed insulation.
- Return the Thermofol membrane to overhang once again and use adhesive tape to temporarily hold it to the deck.



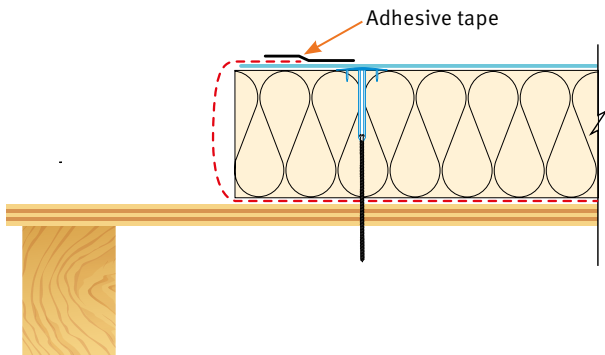
### CONCRETE DECK

- Fold the excess Thermofol membrane down and use adhesive tape to secure to the bituminous AVCL to create a temporary seal.



### PLYWOOD DECK

- Lift the excess DB100 polyethylene AVCL up and over the Thermofol membrane to cover the exposed insulation.
- Use adhesive tape to create a temporary seal.
- Remaining area of plywood deck should also be protected.



## 4 Air and vapour control layers (AVCL)

### 4.1 DB100



Sealed with Bauder Tape 03 and 20

#### INSTALLATION

- Loose-lay over the roof surface with 100mm side and end laps and use Bauder Tape 03 to join all laps.
- On metal profiled decks, ensure an effective seal is achieved where the membrane is not fully supported by the structure.
- Turn up membrane at abutments and penetrations to the topmost height of the insulation and secure to the structure using Bauder Tape 20.



### 4.2 KSD Mica, KSD Foil and TEC DBR

Self-adhesive, SBS modified, elastomeric bitumen air and vapour control layers. Laps are heat sealed to extrude a bitumen bead as confirmation of an effective seam weld.



TEC DBR and KSD Foil are **NOT** suitable for concrete decks.





## 4.2 *continued...*

### INSTALLATION

- Install over the roof surface with 100mm side laps and end laps.
- Dress membrane at abutments, upstands and penetrations to the height of the insulation and fully seal using Bauder recommended bonding methods.

### SPECIFIC INSTALLATION OF TEC DBR AND KSD FOIL

- Refer to specification for confirmation of exact installation instructions.
- Used for installations over certain existing roof systems and deck substrates including profiled metal and plywood.
- Application of Bauder SA Bonding Primer, or Bauder Activator-Primer is essential in a fully adhered build up.



### Tips:

- Use a straight-bladed craft knife to lightly cut the release film on the back of the self-adhesive membranes.
- If the primed deck is slightly damp, prior to installing the AVCL gently warm the deck area in front of the roll with a hot air gun to improve the speed of the self-adhesive bonding application.



# 5 Insulation attachment

Bauder has a wide range of insulations in both flatboard and tapered format for specification within a single ply system.

## 5.1 Tapered insulation schemes

This is a specialist project scheme for increasing or creating falls on a roof and requires a separate design and specification. For the installation of a BauderPIR tapered scheme please refer to a separate document: Bauder Tapered Insulation Installation Guide, available from our technical department.

## 5.2 Flatboard insulation setting out

- **Long edges:** Fully supported or for a metal deck - run at right angles to metal deck troughs.
- **End edges:** Fully supported.
- **Side joints:** Close butted together.
- **End joints:** Stagger brick pattern.

## 5.3 Mechanically fixing the insulation



**Fixings** should meet the following criteria:

- A thermally broken sleeve to ensure the required U-value for the roof is achieved.
- Minimum 75mm diameter washer or a square stress plate of minimum dimension 70 x 70mm.
- Fastener of suitable type and length to penetrate board thickness and deck construction. For metal, plywood and OSB decks the fastener should penetrate through the substrate by 15 - 20mm.

**Minimum quantity of fixings per board** needs to meet wind load calculations for perimeter, corners, and field roof areas, and different quantities may be required for each zone and each project.

**Project fixing plan** should be provided by the supplier to meet wind uplift loads for the project.

## INSTALLATION

- Use insulation tubes and fastener type/length recommended by the supplier for the project.
- Install according to project fixing plan to the quantity required to meet wind uplift calculations for the different roof zones (perimeter, corners, field area).
- Always refer to the wind uplift calculations for number of fasteners per board.

### Tips:

- The number of fasteners per board will be defined by the wind load calculation.
- For ease and speed of application, contractors may choose to install the stated number of fasteners required in the corner zones (high risk areas) across the entire roof area and thereby disregard the need for different fixing patterns in each zone.

## 5.4 Adhering insulation to bituminous AVCL

Specific adhesives are required to bond the different types of insulation to the AVCL, see page 37, 38, or 39 as appropriate. Refer to table below for guidance on suitability.



Refer to the project specification to confirm type of adhesive to use. See table below for compatibility. **It is not possible to adhere insulation to DB100 polyethylene AVCL.**

- Close butt and stagger all boards in a 'brick pattern'.
- Bond each board to the AVCL with a specified adhesive, ensuring an adequate fix. The installation method and coverage rates are specific to the type of adhesive and the project wind uplift calculations.

Insulation to be bonded	Foil-faced AVCLs	Mica finished AVCL
	<b>TEC DBR and KSD Foil</b>	<b>KSD Mica</b>
BauderPIR FA flatboard Foil-faced	Foil Contact Adhesive (canister) – <b>Yellow</b> PU Insulation Adhesive (twin cartridge)	PU Insulation Adhesive (tin) <b>Brown</b>
BauderPIR FA Tapered Foil-faced	Foil Contact Adhesive (canister) – <b>Yellow</b> PU Insulation Adhesive (twin cartridge)	PU Insulation Adhesive (tin) - <b>Brown</b>
BauderROCK unfaced	PU Insulation Adhesive (twin cartridge)	
BauderGLAS	PU Insulation Adhesive (twin cartridge)	
BauderVIP	PU Insulation Adhesive (tin) - <b>Brown</b> PU Insulation Adhesive (twin cartridge)	
EPS insulation	PU Insulation Adhesive (tin) - <b>Brown</b> PU Insulation Adhesive (twin cartridge)	

Table 1

## 5.4.1 PU Insulation Adhesive (twin cartridge)

### INSTALLATION

- Apply in strips following the direction of the board length to give continuous and equally spaced adhesive beads within each board width. Refer to Table 2.
- Adhesive beads are applied 6mm wide and will then foam to 20mm wide.
- Immediately place board onto the adhesive and apply pressure to the board to ensure full contact.
- Allow to cure before waterproofing the insulation boards with Thermofol membrane, (10 mins at 20 °C).



Number of recommended bead strips		
Board width (mm)	Field zone	Perimeter zone*
450,500 or 600	2	3
800	3	4
1000 or 1200	4	6

Table 2

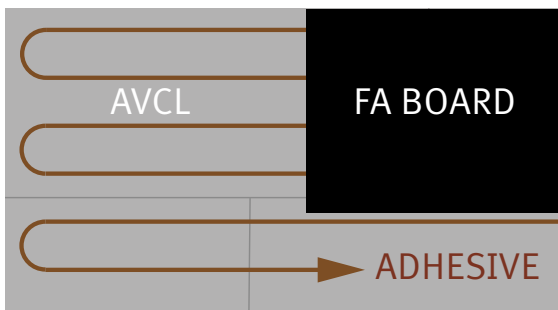


Illustration showing 4 bead strips

## 5.4.2 Foil Contact Adhesive (Canister) – Yellow

Used for adhering foil faced insulation to foil-faced AVCLs.

- Ensure the canister spray system is working correctly and achieves a spray pattern 150 – 200mm wide, depending on insulation board width to be installed.
- Apply one coat of Bauder Foil Contact Adhesive to the AVCL, ensuring an even distribution of contact adhesive is achieved. Approximate coat weight 80g/m<sup>2</sup>.



- Apply one coat of the Foil Contact Adhesive to the underside of the foil-faced insulation board following the recommended spray pattern to achieve a 100% coverage on the boards in the perimeter zone and 50% coverage on the boards in the field zone, ensuring an even distribution of contact adhesive is achieved. Approximate coat weight 80g/m<sup>2</sup> for perimeter zones and field zones (approx. total of 120g/m<sup>2</sup> when a combination of 100% & 50% coverage is applied).
- Avoid trafficking immediately after applying the spray adhesive.
- Allow the solvents to evaporate so that surfaces feel tacky. Minimum 5-10 minutes at 10°C.
- When solvents have evaporated and surfaces are tacky, position insulation boards and apply pressure to ensure full contact.

### IMPORTANT

- Avoid excessive spray as drying time will be increased.
- If adhesive has been left exposed for over 30 minutes or has become contaminated by dust/site debris a second coat may be required to both surfaces.

### 5.4.3 PU Insulation Adhesive (Tin) – Brown

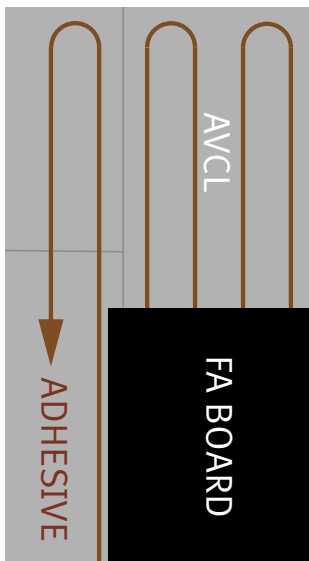


Only suitable for bonding insulation to film or mica finished AVCLs.

- Apply in strips following the direction of the board length to give continuous and equally spaced adhesive beads within each board width.
- See Table 2, page 37 for recommended number of bead strips for different board sizes.
- Ensure adhesive beads are 10 - 20mm wide.
- Immediately place board onto the adhesive.
- Apply pressure to the board to ensure full contact.
- Allow to cure before waterproofing the insulation boards with Thermofol membrane, (60 mins at 10°C).

#### IMPORTANT

- Always refer to the specification for project specific product.



## 6 Membrane attachment

There are three methods of attaching the Thermofol PVC single ply waterproofing layer.

### PREREQUISITES FOR ALL ATTACHMENT METHODS

- Refer to the project wind load calculation for quantities/volumes of attachment elements (ballast/fasteners/adhesive).
- Layout the membrane as required. Refer to Sections 3.3 and 3.4
- Clean laps as required. Refer to Section 3.2
- Ensure full understanding of Chapter 2 Hot air welding lap connection.

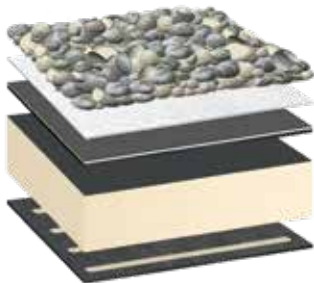
### 6.1 Ballast on loose-laid Thermofol PVC



This type of application is approved on the understanding that the ballast, timber decking, green roof system will be immediately installed to finished areas of waterproofing. If this cannot be achieved, then temporary loading of the waterproofing must be undertaken to resist wind uplift. **The system can only be guaranteed whilst the surface loading required to resist wind uplift remains in place.**

Timber and synthetic promenade decking is a popular finish on residential projects but requires care in design. The decking alone should not be taken to be ballast for resistance to wind load.

When the weight of the ballast is insufficient to meet the wind uplift calculation for the roof area the waterproof membrane should be adhered or mechanically fastened.



Loose-laid ballast



**INSTALLATION:**

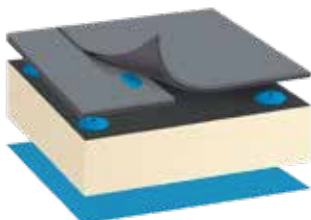
- Prepare the substrate.
- Unroll and align the Thermofol U membrane avoiding wrinkling or stretching it.
- Unroll the next roll of Thermofol U membrane and overlap the side laps by 60mm and head laps 100mm.
- Stagger the end laps of the rolls to reduce cross joints occurring.
- Mechanically fasten at perimeters and abutments. Refer to Section 6.2
- Mechanically fasten with bar fixings and cord at all internal angles and around roof penetrations. The fixing bar to be fastened (where possible into the abutment) at 250mm centres. Refer to Chapter 8.
- Hot air weld the side laps with appropriate hot air welding tool ensuring a minimum of 40 mm weld with a hand welder and 30mm with an automatic welder. Refer to chapter 2.
- Once membrane has cooled, apply a seam probe to the welded lap to ensure the integrity is not compromised. Refer to Section 2.4
- Check membrane is restrained at all perimeters and abutments.
- Install the protection layer/fleece. See Section 7.2
- Immediately install specified ballast to finished areas of waterproofing.

**Remember:** Where loose-laid membranes are secured against wind uplift by use of ballast, it is essential that perimeter trims are secured to a sound substrate such as a fixed timber hard edge (as in all mechanically fastened systems).

## 6.2 Mechanically fastened Thermofol PVC

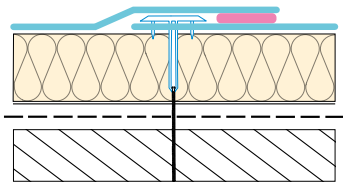


Refer to the project wind load calculation for quantities/volumes of fasteners.



Mechanically fixed

- Prepare the substrate.
- Unroll and align the Thermofol U membrane. If installing over a metal deck, then the membrane must be laid at 90° to the direction of the decking (across the crowns).
- Stagger the end laps of the rolls to reduce cross joints occurring.
- Install a fastener (rectangular tube 80 x 40mm) at one end of the sheet.
- Pull the full length of the membrane as tightly as possible to remove wrinkles and creases. Refer to Section 3.4
- Install fasteners along the membrane, 10mm in from the edge and at a frequency that meets the wind load calculation.
- Ensure fasteners are fixed to the correct depth. Remove any that are too deep or too proud and re-install correctly.
- Unroll the next roll of Thermofol U membrane and overlap the side laps by 100mm and head laps by 150mm.
- Stagger the end laps of the rolls to reduce cross joints occurring. Refer to Section 3.5
- Hot air weld the side laps with appropriate hot air welding tool ensuring a minimum of 40mm weld with a hand welder and 30mm with an automatic welder. Refer to Chapter 2.
- Once membrane has cooled, apply a seam probe to the welded lap to ensure the integrity is not compromised. See Section 2.4



## 6.3 Adhering Thermofol PVC



Refer to the project wind load calculation for specified adhesive and coverage rates.



Adhered

- Ensure insulation board/substrate is dry and clean from grease, dirt, and any other contaminants.
- Unroll and align the membrane. Cut to size where required.
- Fold/roll back approx. half the membrane upon itself.
- Protect the edge/seam to be welded from adhesive overflow.
- Mark out the area to be bonded and apply the appropriate adhesive according to product instructions (Section 6.4).
- Allow adhesive to become tacky; and then for long lengths of membrane ensure one person is either side of the membrane to slide it onto the adhesive primed substrate.
- Repeat for the other half of the membrane.
- Unroll the next roll of Thermofol membrane and align to achieve overlap for side laps by a minimum of 60mm.
- Use a 20Kg water filled roller or a soft hair broom over the adhered membrane to consolidate the contact between the membrane and substrate.
- The end laps of adhered fleece-backed membranes should be close butted, and a cover strap of membrane min 150mm wide welded over the joint to provide a waterproof cover.
- If adhering non fleece-backed membrane with Thermofol Contact Adhesive-Red, cover the joints of the insulation board with self-adhesive foil tape.
- Hot air weld the side laps to ensure a minimum 40mm weld with a hand welder and 30mm with an automatic welder.
- Once the membrane has cooled, check the welded lap with a seam probe to ensure the integrity of the weld. See Section 2.4

## 6.4 Membrane adhesives and application instructions

Specific adhesives are required to bond the different membranes.

	<b>Thermofol FB15 (Fleece-backed membrane)</b>
<b>Bauder FA</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> </ul>
<b>Bauder FA-TE</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> </ul>
<b>Bauder PIR</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> <li>•Fleece Backed Membrane Adhesive (Drum) - <b>Blue</b></li> </ul>
<b>Bauder FA Tapered</b> (inc Ridge & Valley)	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> </ul>
<b>Polystyrene</b> (e.g. EPS)	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> </ul>
<b>BauderROCK</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> <li>•Fleece Backed Membrane Adhesive (Drum) - <b>Blue</b></li> </ul>
<b>BauderGLAS</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> </ul>
<b>Alternative Foil Faced PIR*</b> (e.g. Thermotech Foil)	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> </ul>
<b>Alternative Glass Tissue Faced PIR*</b> (e.g. Thermotech Glass)	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> <li>•Fleece Backed Membrane Adhesive (Drum) - <b>Blue</b></li> </ul>
<b>Existing Bitumen</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Fleece Backed Membrane Adhesive (Drum) - <b>Blue</b></li> </ul>
<b>Plywood</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> <li>•Fleece Backed Membrane Adhesive (Drum) - <b>Blue</b></li> </ul>
<b>Concrete</b>	<ul style="list-style-type: none"> <li>•PU Fleece Backed Membrane Adhesive (Canister) - <b>Pink</b></li> <li>•Spray Contact Adhesive (Canister) - <b>Green</b></li> </ul>



When adhering non fleece-back membrane with Thermofol Contact Adhesive (Drum) - **Red**, cover the joints of the insulation board with self adhesive foil tape.

	<b>Thermofol U12/U15/U18/U20</b>
<b>Bauder FA</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>Bauder FA-TE</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>Bauder PIR</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>Bauder FA Tapered</b> (inc Ridge & Valley)	Consult Bauder Technical Dept
<b>Polystyrene</b> (e.g. EPS)	Consult Bauder Technical Dept
<b>BauderROCK</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>BauderGLAS</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>Alternative Foil Faced PIR*</b> (e.g. Thermotech Foil)	Consult Bauder Technical Dept
<b>Alternative Glass Tissue Faced PIR*</b> (e.g. Thermotech Glass)	• Thermofol Contact Adhesive (Drum) - <b>Red</b> (taped joints)
<b>Existing Bitumen</b>	Consult Bauder Technical Dept
<b>Plywood</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b>
<b>Concrete</b>	• Thermofol Contact Adhesive (Drum) - <b>Red</b>

\* Subject to the insulation board manufacturer's approval

## 6.4.1 PU Fleece Backed Membrane Adhesive (Canister) – Pink

**Applied to** insulation/substrate only

**Application** is via a spray

**Initial grab** after approx. 10 mins

**Fully cured** after 60 mins at 20°C

**Approx coverage rate** is up to 180m<sup>2</sup> per canister



Regularly clean nozzle tips to ensure an even spray pattern with Bauder Spray Gun Nozzle Cleaner 120ml Aerosol.

- Use a test surface to ensure the canister spray system is working correctly and achieves an even spray pattern 300mm wide.
- Protect the edge/seam to be welded.
- Spray-apply an even coat of adhesive to insulation/substrate to achieve full coverage.
- Remove any over-spray from the membrane surface with Bauder PVC Cleaner and a dry cloth.
- Allow the solvents to evaporate from the adhesive for a minimum of 5 mins at 20 °C.
- Roll the fleece-backed membrane into adhesive.
- Continue with installation as described in Section 6.3

### Tips:

- When spraying adhesive, walk backwards if safe to do so, for a clean, untrafficked, even application.

## 6.4.2 Spray Contact Adhesive (Canister) – Green

**Applied to** substrate and fleece-backed membrane

**Application** is via a spray

**Initial grab** after approx.

5 mins

**Fully cured** after 60 mins at 20°C

**Approx coverage rate** is 75-100m<sup>2</sup> per canister



Regularly clean nozzle tips to ensure an even spray pattern with Bauder Spray Gun Nozzle Cleaner 120ml Aerosol.

- Use a test surface to ensure the canister system is working correctly and achieves an even spray pattern 300mm wide.
- Protect the edge/seam to be welded.
- Spray-apply one even coat of adhesive to insulation/substrate to achieve full coverage.
- In a perpendicular direction to the adhesive applied to the insulation/substrate; Spray one even coat to the fleece side of the fleece-backed membrane to achieve full coverage.
- Remove any over-spray from the membrane surface with Bauder PVC Cleaner and a dry cloth.
- Allow the solvents to evaporate from the adhesive layers for a minimum of 5 mins at 20 °C.
- Roll the fleece-backed membrane into adhesive.
- Continue with installation as described in Section 6.3

### Tips:

- When spraying adhesive, walk backwards if safe to do so, for a clean, untrafficked, even application.

## 6.4.3 Fleece Backed Membrane Adhesive (Drum)

### – Blue

**Applied to** insulation/substrate only

**Application** is with a man-made fleeced roller or lambs' wool roller and temperatures must be between 5-30°C

**Initial grab** after approx. 5 mins

**Fully cured** after 45 mins at 20°C

**Approx coverage rate** is 75-100m<sup>2</sup> per drum

**Indicative times** will vary according to weather conditions and temperature and are shown in the table



	OPEN TIMES	CURE TIMES
10 °C.	30 mins	90 mins
20 °C.	15 mins	45 mins
30 °C.	7 mins	25 mins

- Protect the edge/seam to be welded to prevent it becoming contaminated with adhesive.
  - Apply Bauder PU Fleece-Backed Membrane Adhesive directly onto the insulation board with a roller, ensuring a full even coverage of adhesive over the surface of the insulation board.
  - Allow to dry for 15-30 mins before applying waterproofing.
- NOTE:** In exceptionally hot weather it will be quicker.
- Roll the fleece-backed membrane into adhesive.
  - Consolidate the bond with a 20Kg water filled roller.
  - Continue with installation as described in Section 6.3



## 6.4.4 Thermofol Contact Adhesive (Drum) – Red

**Applied to** insulation/ substrate/upstand/detail and un-backed Thermofol U membranes

**Application** is with a brush or roller and temperatures must be between 5-30°C.

**Initial grab** 2-4 mins and within 10 mins

**Fully bond strength** after 1 week

**Open time** is 15 mins

**Approx coverage rate per drum** 50m<sup>2</sup> on closed substrates and 20m<sup>2</sup> on very absorbent substrates

**Indicative times** will vary according to weather conditions and temperature and are shown in the table



	OPEN TIMES	CURE TIMES
10 °C.	30 mins	90 mins
20 °C.	15 mins	45 mins
30 °C.	7 mins	25 mins

- Prime any particularly absorbent surfaces with a coat of adhesive and allow to dry completely.
- Protect the edge/seam to be welded to prevent it becoming contaminated with adhesive.
- Apply Thermofol Contact Adhesive directly onto both surfaces (substrate and membrane) with a brush or roller, ensuring a full even coverage.
- Carefully bring the membrane into place, avoiding trapping air beneath the membrane and for:
  - Flat areas (insulation substrate) – consolidate the bond with a 20Kg water filled roller.
  - Upstands and details - consolidate using a hand roller, applying maximum pressure.
- Continue with installation as described in Section 6.3

# 7 Separating layers and protection layers

These layers protect the Thermofol membrane from chemical or mechanical damage.

## 7.1 Separating layers

Under membrane layer that shields the Thermofol U from coming in to contact with either: materials which could damage the membrane physically i.e. timber, rough concrete or sharp metal causing damage to the underside of the membrane; or cause chemical contamination of the membrane or other material.

There are two products:

### GV120

	<b>GV120</b>
Thickness	0.75mm
Roll size	2 x 100m
Coverage	200m <sup>2</sup>
Roll Weight	24Kg



### PF300

	<b>PF300</b>
Thickness	3.0mm
Roll size	2 x 60m
Coverage	120m <sup>2</sup>
Roll Weight	40Kg



Separating layer suitability:

Substrate	Separating layer required for U12/15/18/20	Requirement for U15 FB
Concrete	GV120	NONE The integral 2mm fleece provides protection
Bitumen	PF300	
Plywood/OSB	GV120	
EPS insulation	GV120	
Existing single ply	GV120	

## INSTALLATION

### GV120 or PF300

- Loose lay over the area to have the Thermofol U membrane installed.
- Side and head laps to overlap by 100mm.
- Take up all vertical abutments where the protection of the membrane may be required and held in place with Bauder Adhesive Tape 20.
- Install Thermofol U membrane as required. See Chapter 6.

### Tips:

- Fleece-backed membranes can be used if protection is required and a separate fleece is not a practical or viable option due to deck type or attachment method restrictions.

## 7.2 Protection layers

Over membrane layer to protect some installations that will have a surface finish installed such as decking, paving, ballast, or a green roof.

There are three products offering different levels of protection: FSM 600 (data in the table below), PF300 and GV120 (data in Section 7.1) FSM 600 is a heavy duty, 4mm thick protection layer made from polyester and polypropylene fibres.

	<b>FSM 600</b>
Thickness	4.0mm
Roll size	2 x 30m
Coverage	60m <sup>2</sup>
Roll Weight	36Kg



### Protection layer suitability

Surface Finish	Protection layer required for		
	U12	U15/18/20	U15 FB
XF301 Sedum System	DO NOT install on U12	Not necessary	Not necessary
Extensive substrate green roof	DO NOT install on U12	FSM 600	FSM 600
Paving slabs	FSM 600	FSM 600	FSM 600
Ballast	FSM 600	FSM 600	FSM 600
Bauder pedestal system	PF300	PF300	PF300
Decking on paver pads	PF300	PF300	PF300
Decking on timber bearers	PF300	PF300	PF300
EPS & XPS insulations	GV120	GV120	GV120

## **FSM 600**

### **INSTALLATION**

- Lay out to cover entire roof area.
- All overlaps to be 150mm or as determined in the specification.
- Use a protection board when cutting to size with a knife or scissors.
- Adhere laps lightly with a hand held heat gun.

### **Tips:**

- Refer to Green Roof Installation Guide for specific instructions on installing FSM 600 with drainage trim and around outlets etc.

## **GV120 or PF300**

Lightweight protection fleeces, technical information as per Section 7.1

### **INSTALLATION**

- Loose lay over the Thermofol membrane.
- Overlap side and head laps by 100mm.
- Use a protection board when cutting to size with a knife or scissors.
- Take up all vertical abutments where the protection of the membrane maybe required and held in place with Bauder Adhesive Tape 20.

## 8 Metal and Bars

Bauder has a range of Thermofol installation metals to complement the system.

### 8.1 Thermofol preformed metal

Pre-coated metal in a range of profiles and sizes supports the installation of either a mechanically fixed or adhered Thermofol system.



**Fixing torque** – all metal should be installed with a clutch mechanism screw-gun with torque settings to ensure fixings are at correct tension otherwise the metal will depress and need replacing.

#### INSTALLATION

- Align and make parallel all pieces of precoated metal allowing for a 2-3mm expansion gap.
- Ensure fixings at the base of an upstand are made in the flat area, avoid fixings into the upstand. If unavoidable, contact Bauder for advice and support.
- Position fasteners to ensure they are at least 25mm from the edge of any piece of precoated metal.
- Weld a cover strap min 150mm wide to seal the joints.
- Leave a 40mm wide unwelded central gap of cover strip between metal sections to allow a sufficient area of membrane for expansion and contraction movement in the joint.



## 8.2 Bauder fixing bar

Used in the creation of changes in direction for mechanically fastened systems, particularly when the detail is irregular in height and width i.e. on a tapered insulation scheme.

### INSTALLATION

- Align on the horizontal into the angle of the detail.
- With appropriate fixings, fasten through the Thermofol system at 100mm centers.
- Weld Bauder PVC Cord to the membrane behind the Fixing Bar to prevent the membrane being pulled under the bar.
- Leave a 10mm wide gap between fixing bar ends to allow for expansion and contraction.



### IMPORTANT

- If the bar must be secured to the vertical upstand then a cover strap of Thermofol membrane is installed over the bar to waterproof the fasteners.



## 8.3 Bauder peel bar

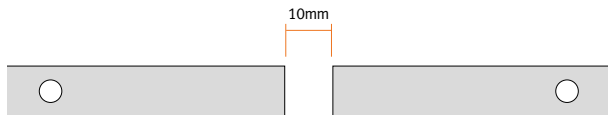
Used in the creation of changes in direction for fully adhered systems, particularly when the detail is irregular in height and width i.e. on a tapered insulation scheme.

Pre-drilled hole size 6.5mm to suit fasteners up to 6.3mm diameter.  
Not suitable for tube washers.



### INSTALLATION

- Align on the horizontal into the angle of the detail
- With appropriate fixings, fasten through the Thermofol system at 150mm centres.
- Leave a 10mm wide gap between each section of peel bar to allow for expansion and contraction.



### IMPORTANT

- If the bar must be secured to the vertical upstand then a cover strap of Thermofol membrane is installed over the bar to waterproof the fasteners.





# 9 Detailing

## 9.1 Upstands

The waterproofing of upstands can be achieved in different ways according to installer proficiency and selection. This guide shows two methods for mechanically fastened systems and one for adhered.



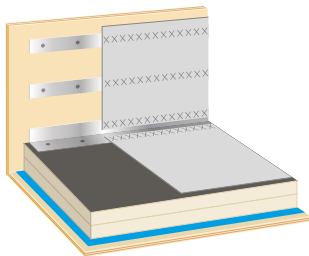
### Criteria for ALL upstand detailing:

- Upstands should be completed in either Thermofol Metal or Thermofol U membrane. Unreinforced D18 and FB membrane is not suitable.
- Upstands must extend 150mm above finished roof surface. Generally this is the waterproofing layer, but in roofs with ballast, decking, paving or a planting scheme (green roof) the 150 mm is to be measured from the top of the installed finish.
- Downstands (of separate metal flashings) should lap the upstand by min. 75mm.
- Downstands should always be clear of the roof surface by a minimum of 50mm to avoid capillary action.
- At changes in direction, horizontal to angled/vertical plane you can use either:
  - Thermofol Metal (mech fix or adhered systems).
  - Fixing Bar with cord – mechanically fastened systems.
  - Peel Bar – adhered systems.
- Exposed termination of the waterproofing must be completed using Thermofol Metal.
- Reliance upon sealant as the only means of protection **must** be avoided.
- If there is a damp proof course in the abutment construction, it must be set to discharge above the upper termination of the waterproofing.

## 9.1.1 Mechanically fastened upstand – Option A

### INSTALLATION

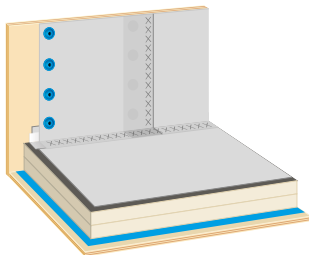
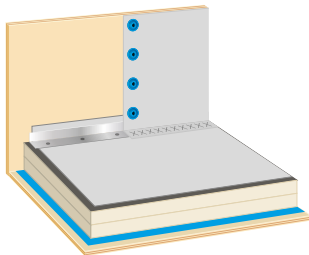
- Mechanically fasten a 50mm wide piece of Thermofol coated metal to the upstand at 500mm centres with appropriate fixings.
- Weld the membrane to the clean and dry coated metal.



## 9.1.2 Mechanically fastened upstand – Option B

### INSTALLATION

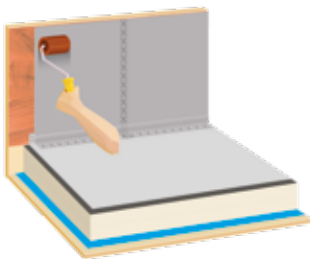
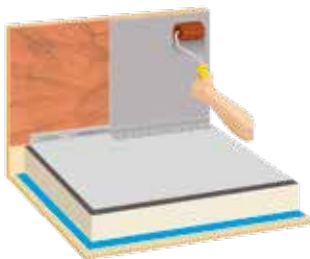
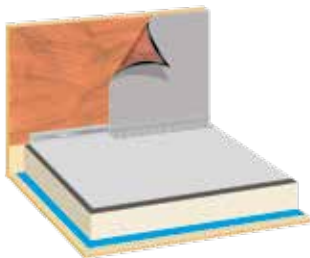
- Cut the membrane down to a half width of a full roll 750mm.
- Hang the membrane from the top of the upstand down to the base.
- Mechanically restrain the membrane at the top and the bottom of the upstand with either Thermofol Metal or Fixing Bar.
- Mechanically fasten down the membrane edge (from top to bottom at 250mm centres).
- Heat weld the laps of the membrane.



### 9.1.3 Adhered upstand

Use Thermofol Contact Adhesive (Drum) – **Red**. See Section 6.4.4

- Surfaces must be clean, dry and free from contamination.
- Application temperature must be between 5-30°C.
- Prime any absorbent surfaces with a coat of adhesive and allow to dry completely.
- When adhering un-backed Thermofol membrane to insulation, tape the board joints with self-adhesive foil tape prior to applying the adhesive.
- Apply adhesive to both surfaces with a brush or lambswool roller, ensuring full even coverage. **The weld area must be kept clear of adhesive.**
- Allow adhesive to become tacky, 1-4 mins but within 10 mins (times will depend on temperature, substrate and quantity of adhesive – see Section 6.4.4)
- Carefully bring the membrane into contact with the upstand avoid trapping air and consolidate with a hand roller. **Apply maximum pressure.**
- Full bond strength is achieved after 1 week.



#### IMPORTANT

- At lower temperatures and high humidity blooming can occur, bonding under these conditions should be avoided.

## 9.2 Prefabricated corners

Used to dress internal and external 90° corners. Prefabricated corners can also be used to fit corners over and under 90° if warmed and manipulated to suit.

Where it is not possible to use prefabricated corners a gusset must be dressed to an internal corner; and a piece of unreinforced Thermofol D detailing membrane can be dressed to an external corner with a 'thumb print'.

### INSTALLATION

- Position the prefabricated corner.
- Weld from the centre outwards until entire patch is welded.
- Ensure patches are wrinkle and crease free.

### Tips:

- Internal and external corner patches can be reversed to allow them to be used at other junction points to ensure a watertight seal is easy to achieve.



## 9.3 Flexible pipe collars

### INSTALLATION

- Cut a hole in the Thermofol field membrane slightly smaller than the pipe diameter. This should extend up the pipe by 25mm.
- Take a piece of Thermofol D unreinforced membrane, wrap around the pipe and weld together.
- Turn down the Thermofol D membrane onto the field sheet and weld together.
- The pipe collar can be pointed with Bauder sealant and then a stainless steel jubilee clip fitted.



### IMPORTANT

- It is imperative that the upstand of the collar fits tight to the pipe being dressed to ensure a jubilee clip can be attached without gathering the membrane.

## 9.4 Rooflights

Use Thermofol U membrane with Thermofol Contact Adhesive (Drum) – **Red**. See Section 6.4.4

### INSTALLATION

- Cut suitable pieces of Thermofol U membrane to fit the rooflight kerb with an overlay around the corners for welding.
- Apply Thermofol Contact Adhesive (Drum) – **Red** to both the underside of the membrane piece and the rooflight kerb ensuring a full even coverage of adhesive. **The weld area must be kept free of adhesive.**
- Allow adhesive to become tacky, typically 2-4 mins but within 10 minutes.
- Carefully bring the PVC membrane into contact with the rooflight kerb taking care to avoid trapping air, consolidate using a hand roller. **Apply maximum pressure.**
- Test the weld seam, see Section 2.4
- Full bond strength is achieved after 1 week.



### IMPORTANT

- At lower temperatures and high humidity blooming can occur, bonding under these conditions should be avoided.

## 9.5 Décor profiles

Specified by the designer to enhance the aesthetic finish of the roof and can be placed to hide membrane joints in the main flat area.



**Storage:** do not allow profiles to become twisted or buckled.

**Positioning:** Careful consideration is required when roof areas to receive profiles are not square, the roof should be measured, and guidelines marked on the roof to ensure a symmetrical pattern is maintained.

**Cutting:** Profiles can be cut with a straight bladed Stanley knife on a cutting board; this must always be carried out prior to being fixed to the main flat area, if the profile is stiff during the winter months this can be warmed lightly with the hot air tool to aid cutting.



### Technical data

Colour availability	Light grey (RAL 7035)	
	Blue grey (RAL 7031)	
	Anthracite (RAL 7016)	
Size (w x h) mm	35 x 27	
Length (m)	3	
Thickness (mm)	1.8	
Weight per length (Kg/pc)		0.780



## INSTALLATION

- Measure and mark out with a chalk line the location for the profiles on the roof with full consideration given to flow of rainwater to ensure unrestricted movement to the appropriate outlet.
- Ensure the end/termination points are marked uniformly.
- Tack weld one end in the centre of the profile underside.
- Pull straight the entire profile length.
- Check measurements and profile position is correct as once attached damage will occur to the main flat area if the profile must be removed and this will require repairing before commencing fixing of the profiles.
- Under tension, to ensure the profile remains straight, tack weld the entire length. A straight metal edge can be used as a guide.
- Ensure sufficient tack welds will hold the profile in place for when welding.
- Weld either side of the tack welds along both edges of the profile to secure to the waterproofing, consolidating with a hand-held silicone roller.



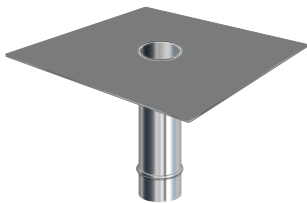
## 9.6 Rainwater outlets



**Pre-installation criteria:** The AVCL and insulation should be laid and the desired diameter hole cut into the insulation board to allow the outlet spigot to pass through into the connecting pipe, the membrane should be laid to the main flat area and the hole in the insulation board located and cut out of the membrane to the main flat area.

### 9.6.1 Stainless steel outlet

Stainless steel outlet with factory applied Thermofol Membrane flange and rubber sealing ring on the spigot which is left in-situ to ensure a seal with the connecting pipe.



#### Technical data

Thermofol stainless steel outlet	DN70	DN100	DN150
To suit rainwater pipe size (mm)	75-97	110-128	160-178
Spigot length (mm)	400		
Stainless steel base plate (mm)	250x250		
Thermofol membrane flange (mm)	350x350		
Flange membrane colour	blue/grey or light grey		

## INSTALLATION

- Ensure all pre-installation criteria have been followed. See facing page.
- Keeping the rubber sealing ring on the spigot, insert the stainless steel outlet into the mouth of the outlet pipe.
- Push the membrane flange down onto the main flat area to ensure a flush fit.
- If the outlet is sitting proud, consider reducing the insulation slightly to ensure water flow is not inhibited in this region.
- Temporarily fold back to reveal pre-drilled holes, fasten the outlet into position through the insulation into the deck using suitable fixings.
- Un-fold/return the membrane flange flat to the system.
- Weld the membrane flange to the main flat area, starting at the centre and work outwards until the entire flange is welded to the Thermofol field sheet.
- Test the weld seam, see Section 2.4



## 9.6.2 Rigid PVC outlet

PVC outlet with rigid PVC flange to which a cut piece of Thermofol U membrane is welded.



**Membrane sleeve:** to be cut on site using Thermofol U membrane in appropriate colour to dimensions indicated in the technical table below.

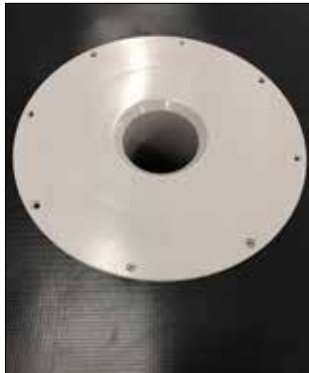


Technical data			
Thermofol Rigid PVC Outlet	DN70	DN100	DN150
To suit rainwater pipe size (mm)	75	110	160
Spigot length (mm)	300		
Rigid PVC base plate (mm)	300x300	350x350	
Thermofol membrane flange to be cut on site (diameter mm)	350x350		
	400mm for DN70 and for 500mm DN100/150		
	Central circular aperture 80mm	Central circular aperture 110mm	Central circular aperture 160mm
Outlet colour		light grey	

### INSTALLATION

- Ensure all pre-installation criteria, section 9.6 introduction, have been followed.
- Determine if a sealing ring is required to ensure a flush fit into the outlet pipe, place on spigot.
- Insert the rigid PVC outlet into the mouth of the outlet pipe.
- Push the base plate down onto the main flat area to ensure a flush fit.

- If the outlet is sitting proud, consider reducing the insulation slightly to ensure water flow is not inhibited in this region.
- Using the pre-drilled holes, fasten the outlet into position through the insulation into the deck using suitable fixings.
- Cut a circular piece of membrane 400/500mm diameter (depending upon outlet size, see table) and remove a central circular piece with a diameter 10mm larger than the outlet pipe diameter to create a waterproofing membrane plate.
- Place the correctly cut membrane plate over the outlet centrally.
- Weld the membrane to the outlet up to and around the aperture.
- Weld the membrane to the main flat area, working outwards until the entire membrane plate is welded to the Rigid PVC outlet and the Thermofol field sheet.
- Test the weld seam, see Section 2.4



### 9.6.3 Rigid PVC parapet outlet

Rigid PVC parapet outlet with rigid PVC spigot and 90 degree formed internal corner to which a cut piece of Thermofol U membrane is welded.



**Membrane sleeves** to be cut on site using Thermofol U membrane in appropriate colour to dimensions indicated in the table below.

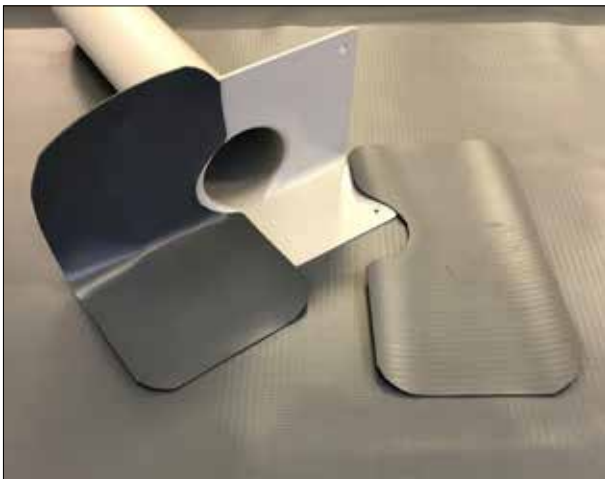


Technical data	
Thermofol Rigid PVC DN 100 parapet Outlet (mm)	280 (w) x 180 (h) x 110 (d)
Parapet aperture required diameter (mm)	Ø 115
Spigot diameter (mm)	480
Thermofol membrane plate to be cut on site (mm)	250 (w) x 450 (h) (2 No) Central circular aperture 110 mm
Outlet colour	light grey

#### INSTALLATION

- Ensure all pre-installation criteria, section 9.6 introduction, have been followed and that the desired diameter hole is cut into the parapet to allow the outlet spigot to pass through into the connecting pipe or hopper.
- Insert the rigid PVC outlet through the parapet.
- Push the right-angled base plate down into the base of the parapet and main flat area to ensure a flush fit.
- If the outlet is sitting proud, consider reducing the insulation slightly to ensure water flow is not inhibited in this region.

- Using the pre-drilled holes, fasten the outlet into position through the insulation into the deck and into the parapet using suitable fixings.
- Cut two matching pieces of Thermofol U membrane, as shown.
- Place one of the correctly cut membrane pieces over the outlet.
- Weld this piece of membrane up to and around the aperture of the rigid PVC parapet outlet.
- Weld the membrane piece to the vertical parapet and main flat area, working outwards until the entire membrane piece is welded to the outlet and the Thermofol field/upstand sheet.
- Repeat for the second piece of membrane.
- Test the weld seam, see Section 2.4



## 9.7 Walkway

Reinforced PVC membrane with dark grey embossed finish loose laid over the completed Thermofol system and welded into place.



**Used** for areas that will be subjected to heavy and regular foot traffic or as working platforms for additional protection to reduce the compressive load to the thermal insulation and provide an identified and safe access route.

Technical data	
Roll size (m)	0.75 x 20
Roll weight (Kg)	33 (two-man lift)
Surface finish	Top: Dark grey (RAL 7012)
	embossed Bottom: Dark grey
Thickness (mm)	2
Reinforcement	Polyester



### INSTALLATION

- Mark out the location for the walkway membrane with a chalk line.
- Ensure the identified zone is clean, dry and free from dirt or other contaminants, see section 3.1
- Layout the walkway membrane onto the field sheet.
- Either loose-lay, or adhere with Thermofol Contact Adhesive-Red over the finished membrane surface.
- heat weld the full perimeter of the walkway onto the field sheet with a minimum 30mm weld.
- Ensure a gap of at least 20mm is left between the end of one roll of walkway and the next roll.
- Test the weld seam, see Section 2.4

### Tips:

- Additional protection can be provided by installing a flat section of 0.7mm galvanized metal sheet above the waterproofing membrane and beneath the walkway. This metal sheet must be fully wrapped in PF 300 protection fleece to protect the membrane from damage.



## 9.8 Lightning conductor clips

Universal clip riveted to patch of Thermofol U membrane (3 grey colours) to suit coated and uncoated 25mm x 3mm conductor tape.



**Commissioning** of the lightning conductor scheme is to be carried out by a specialist company in conjunction with the roofing contractor.

Technical data	
Size	100 x100mm
Installation centres (maximum)	1 per metre (consult lightning conductor engineer)
Colour availability	
Light grey (RAL 7035)	
Blue grey (RAL 7031)	
Anthracite (RAL 7016)	



### INSTALLATION

- Mark out the location for the lightning conductor tape with a chalk line.
- Weld the Lightning Conductor Clip to the Thermofol membrane at maximum 1 metre centres or at centres detailed by the installer of the lightning protection system.
- Install the lightning conductor tape.
- Close the clip and snap tight to secure.

## 9.9 LiquiPOCKET

A two-component, flexible PMMA based resin compound used to seal around penetrations challenging.



**Mixing the components:** must be carried out on a protective sheet so that any spills do not come into contact with the waterproofing membranes/system.

**Safety:** Refer to Safety Data Sheet for all storage, PPE, handling and disposal.

**Installation precautions:** Ambient conditions will impact the ability to apply the product correctly, climatic temperature should be between 0°C and +35°C with any humidity up to 95%.

Technical data	
Colours	Black-grey (RAL 7021)
Coverage	2600mm <sup>3</sup> Approx. 250mm x 250mm x 40mm deep
Open pot life	Approx. 15 mins
Rainproof time	Approx. 30 mins
Applying loads	After 1hr
Thickness (mm)	2
Reinforcement	None



### INSTALLATION

#### STEP 1. Preparation

- The area must be clean, dry and free from dust, laitance, grease, oil and any other contaminants.
- Plastics should be abraded to provide a key.

#### STEP 2. Create a frame around the penetration

- Use timber or metal angle to provide minimum 50mm clearance all-round the penetration. The frame should be 30-50mm deep and a minimum of 10mm above any fixings that may be present.
- Apply appropriate Bauder primer to the frame.

### STEP 3. Waterproof the frame

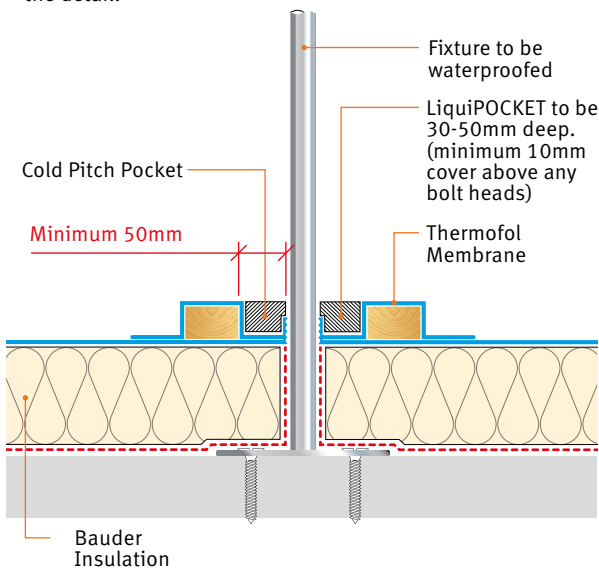
- Use the appropriate Thermofol membrane to seal the frame and make it watertight and prevent leakage of the LiquiPOCKET resin.

### STEP 4. Mix the LiquiPOCKET resin

- Pour entire contents of LiquiPOCKET resin into empty bucket.
- Slowly add LiquiPOCKET filler whilst stirring until the two products are completely mixed into a smooth uniform consistency. Leave for 1 minute and then remix thoroughly.

### STEP 5. Fill the frame with mixed LiquiPOCKET

- Pour mixture into pocket, ensuring it is completely filled to the top as this will avoid future ponding of rainwater at the detail.



## 9.10 Fall arrest systems

Bauder approves the use of the SFS Soter II and the Latchways Constant Force man safe posts.



**Installation of the posts** must be carried out by SFS or Latchways trained operatives respectively

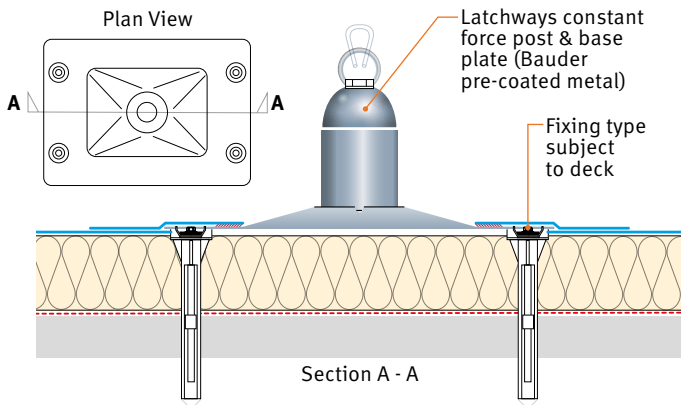


Weathering of the fall arrest posts should be carried out by the Bauder Roofing Contractor using pre cut Thermofol membrane patches heat welded directly to the PVC compatible base plate. Ensuring a completely secure link between the fall arrest plate and the main field sheet.

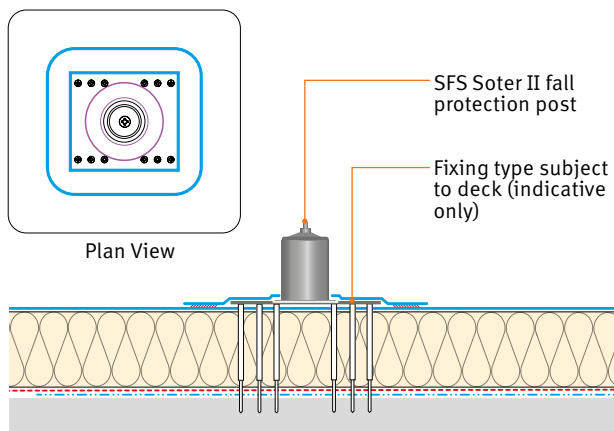
Latchways Thermofol compatible post CFP P/N: 65616-00

SFS Soter II Thermofol compatible post  
1665989 (FP-BP-MH-PVC)

## Latchways



## SFS Soter II



# 10 Summary of measurements

## Membranes

■ Overlap at roll ends	100mm minimum
■ Overlap at roll ends (non FB membrane)	250mm maximum
■ Width of membrane sidelap (mechanically fastened)	100mm minimum
■ Width of membrane sidelap (adhered/ballasted)	60mm minimum
■ Width of seam welds (handheld)	40mm minimum
■ Width of seam welds (automatic)	30mm minimum
■ Diameter of patches	200mm minimum
■ Overlap of patches from extent of damage	100mm minimum
■ Overlap on rolls of Air & Vapour Control Layers	100mm

## Adhesives and accessories

■ Lowest temperature for using adhesives	5°C
■ Distance of Thermofol metal fixing centres	200mm maximum (staggered)
■ Gap between Thermofol metal sections	2-3mm
■ Width of horizontal leg of Thermofol metal sections	70mm minimum
■ Distance from fixing to edge of membrane or metal	30mm maximum
■ Distance from fixing to edge of membrane or metal	10mm minimum







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