



PVC AND TPO SINGLE PLY ROOFING SYSTEMS



YOUR ROOFING AND
WATERPROOFING PARTNER





World class systems for single ply roofing

Contents

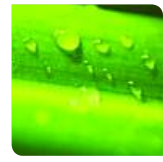
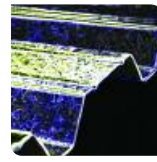
Introduction	3
■ Modern membranes for any substrate	3
■ Applications	3
■ Flag-Soprema single ply membranes	4
■ Roof types	5
System design and installation	6
■ Flagon PVC	6
■ Flagon TPO	8
■ Copper Art® and Silver Art®	10
■ Environmental commitment	12
■ FS-Thermshield thermal insulation	13
■ Flagon PVC application details	14
■ Flagon PVC installation	18
■ Flagon TPO application details	22
■ Flagon TPO installation	26
Our systems	32
Other Flag-Soprema systems	34
Sopracover warranty scheme	35



The Single Ply Roofing Association (SPRA) represents membrane manufacturers, associated component manufacturers and specialist sub contractors and aims to ensure the delivery of best value single ply roofing systems, through a quality assured partnership.

By specifying products and specialist installation by SPRA Manufacturer, Associate and Contractor members you can be assured that all parties meet strict quality criteria. Compliance with these criteria and with the Code of Conduct is assessed at application, by annual audit and by random spot checks.

For further information, and to obtain copies of the SPRA Design Guide and other documents, go to www.spra.co.uk or call 0115 914 4445.



Introduction

Modern membranes for any substrate

Flag-Soprema offers a comprehensive range of TPO and PVC single ply membranes for wide-ranging applications. Our 40 year-plus track record in the roofing, civil engineering and hydraulic sectors has given us the experience and product development expertise to secure a market-leading position.

In addition our Copper Art® and Silver Art® systems have the aesthetic quality of traditional metal roofing at a fraction of the cost.

Each membrane is designed to meet the requirements of particular applications as noted below.

Applications

Flagon TPO and PVC membranes have long life expectancy and are suitable for:

- Ballasted roofs - both with and without pedestrian access
- Inverted roofs
- Roof gardens
- Mechanically fixed systems
- Fully adhered systems
- Exposed vertical surfaces
- Complex detailing





World class systems for single ply roofing

Flag-Soprema single ply membranes

Flagon membranes represent a new generation of synthetic liners made using innovative formulations. Flagon development has been based on experience, synergy, effective co-operation and innovative manufacturing technologies:



- **Experience** gained by Flag which, since 1963, has developed and manufactured synthetic waterproofing membranes for use in the roofing, civil engineering and hydraulic sectors
- **Synergy** with industry-leading manufacturers of polyolefins, who have developed and introduced these new materials to achieve exceptional waterproofing performance
- **Co-operation** with the best designers, contractors and installation companies
- **Innovative manufacturing technologies** using synthetic waterproofing materials of the highest quality and performance



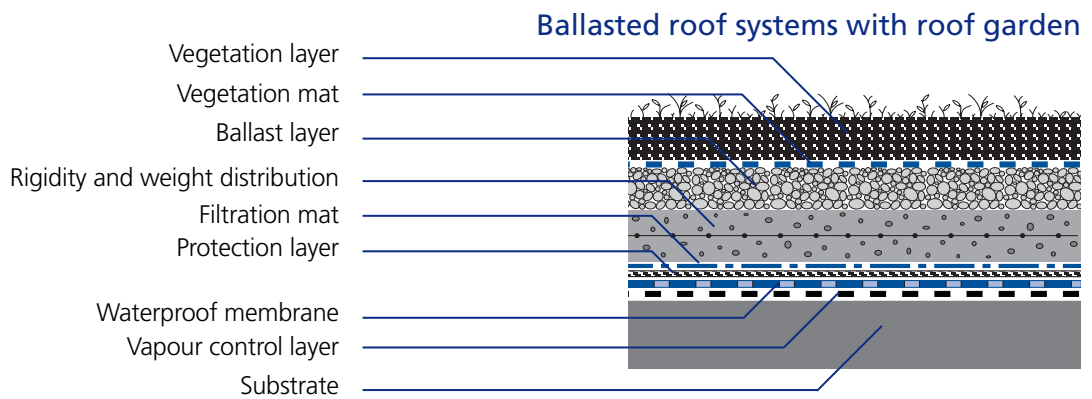
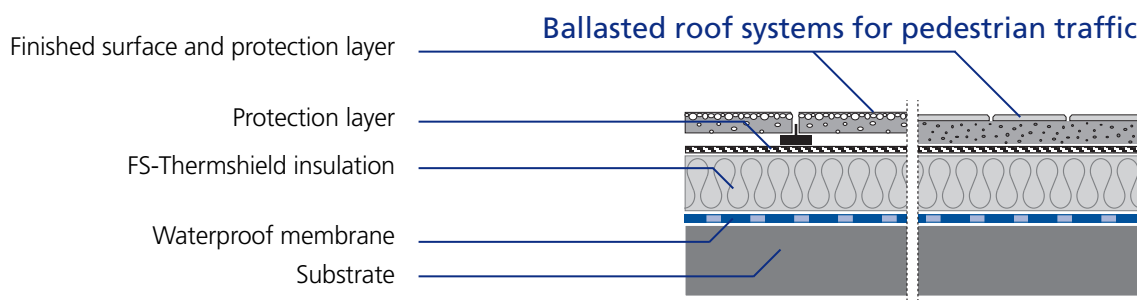
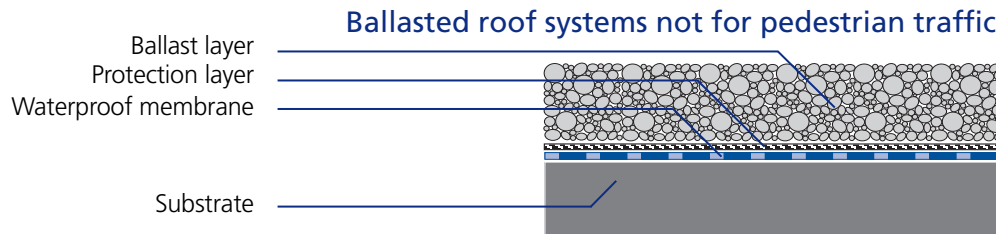
In addition to our metallic finished Copper Art® and Silver Art® range, which is featured on page 10-11, Flagon membranes are also available in three standard shades for use with our décor profiles. Available in zinc, lead and verdigris, they provide a pleasing alternative to folded or standing seam metal covering.



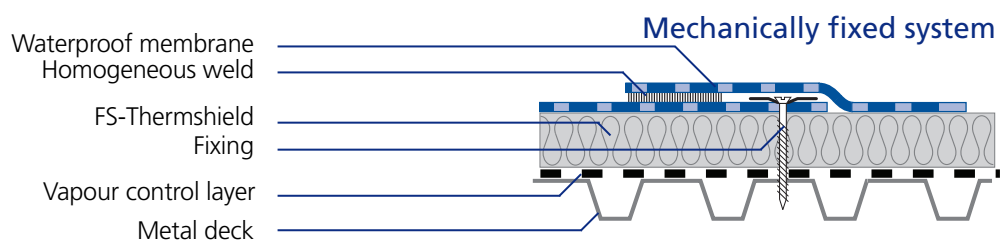
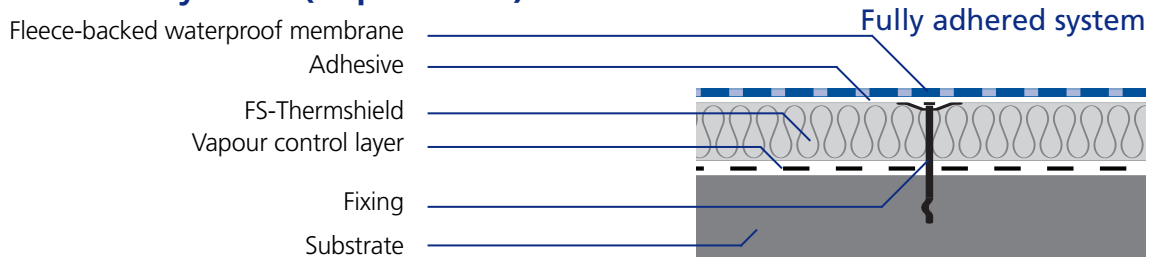
Flagon membranes are also available in any RAL colour as well as graphic treatments such as a symbols, trade marks or logos. Contact Flag-Soprema directly for more information.

Roof types

Ballasted roof systems (protected)



Exposed roof systems (unprotected)





World class systems for single ply roofing

FLAGON
PVC

Flagon PVC

Flagon PVC is a tough, weather resistant membrane that has excellent puncture and rot resistance.



Key characteristics of Flagon PVC membranes:

- Flexible in low temperatures
- Unaffected by hot/cold cycles
- High mechanical resistance
- Resistant to static and dynamic puncturing
- Vapour permeability
- Adaptable to structural movement
- Resistant to root growth and micro-organisms
- Will not rot
- Resistant to weathering and UV radiation
- The surface colours may be chosen from the RAL range
- Glass mesh-reinforced membranes – exceptional dimensional stability
- Polyester mesh-reinforced membranes – high resistance to tear under wind stress



Flagon PVC waterproof membranes can be used for new build and refurbishment. They have been designed both for ballasted roof systems (protected), including green roofs, as well as for exposed roof systems (unprotected) and have a life expectancy of over 40 years.

Flagon PVC

Applications

	PVC Flagon SFC	PVC Flagon SV	PVC Flagon SRF	PVC Flagon SR	PVC Walkway	Granular
Ballasted roof system not subject to pedestrian traffic	✓	✓	✓	✓		
Ballasted roof system subject to pedestrian traffic					✓	✓
Ballasted roof system for roof garden	✓	✓	✓	✓		
Inverted roof	✓	✓	✓	✓		
Mechanically fixed roof system			✓	✓		
Mechanically fixed roof system on thermal insulation			✓	✓		
Fully adhered system on thermal insulation	✓	*✓				
Fully adhered system on reinforced concrete	✓					
Fully adhered system – renovation of bituminous waterproofing	✓					
Fully adhered system with exposed bituminous coating	✓					
Exposed vertical surfaces		✓		✓		
Complex details		✓				

* Adhered with a contact adhesive on vertical surfaces



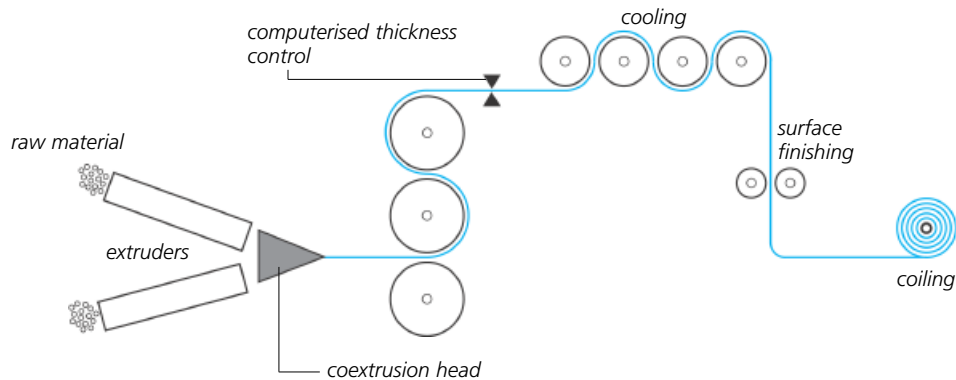


Manufacturing process

There are two main processes for Flagon PVC:

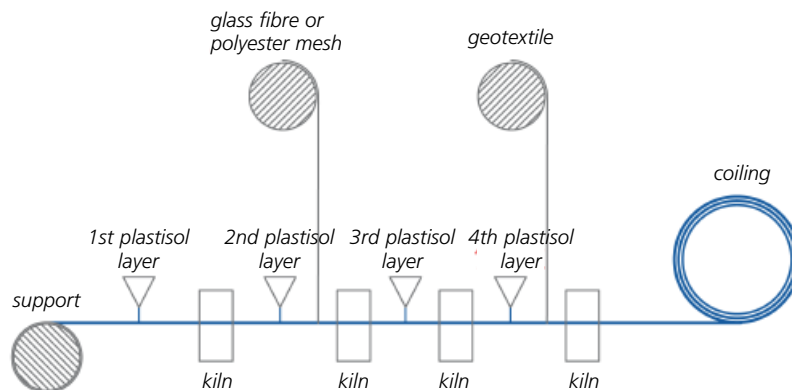
Co-Extrusion

Raw materials are passed through a chamber, heated and pressed into a co-extrusion head and then laminated. Membrane thickness is automatically adjusted to obtain a single-layer homogeneous, non-reinforced membrane with high tensile properties and high resistance to static and dynamic puncturing. This process can also produce a two-colour, single-layer membrane with a signal layer.



Caste Spreading

This process creates a waterproof membrane with an integral reinforcement layer. A spreading head lays down a substrate of a raw liquid-viscous material called 'plastisol'. After a gelation (melting) process the plastisol solidifies. The spreading and gelation process is repeated four times creating a membrane of four differently formulated layers. An internal reinforcement layer, either polyester or glass mesh, is inserted between the second and third layers. This process creates a molecular bond between the layers, creating a homogeneous, flexible single-layer membrane. It can be combined with a thermally treated geotextile layer to improve gripping characteristics or allow it to be laid on materials that are not chemically compatible with PVC-P. Two-colour, single-layer membranes with a signal layer can be produced.



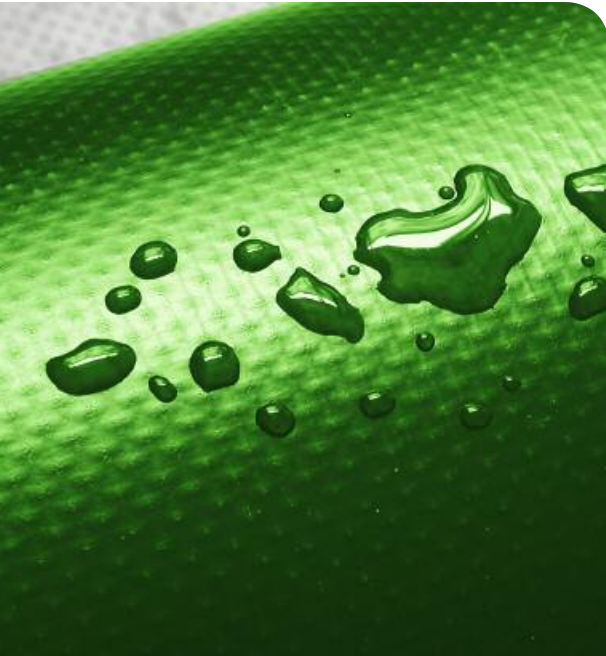


World class systems for single ply roofing

FLAGON TPO

Flagon TPO

Our Flagon TPO membranes have a unique formulation. Flagon EP is the only TPO single ply membrane with a certified BRE Green Guide A+ rating.



Key characteristics of Flagon TPO membranes:

- Excellent weldability
- Softness and flexibility
- Excellent dimensional stability
- High weather and UV resistance
- Non-toxic
- Resistant to a wide range of chemical attacks
- Compatible with most insulation including expanded and extruded polystyrene
- Compatible with oxidised bitumen
- Highly resistant to puncturing
- Resistant to root growth and micro-organisms
- Adaptable to structural movement
- Environment and user friendly
- Proven installation history



Flagon TPO liners have a life expectancy of over 30 years. Our existing waterproofing systems, more than ten years old, do not show any signs of deterioration.

Flagon TPO

Applications

	TPO Flagon EP/PR-F	TPO Flagon EP/PR	TPO Un-Reinforced	TPO Walkway
Ballasted roof system not subject to pedestrian traffic	✓	✓		
Ballasted roof system subject to pedestrian traffic				✓
Ballasted roof system for roof garden	✓	✓		
Inverted roof	✓	✓		
Mechanically fixed roof system	✓	✓		
Mechanically fixed roof system on thermal insulation	✓	✓		
Fully adhered system on thermal insulation	✓	*✓		
Fully adhered system on reinforced concrete	✓			
Fully adhered system – renovation of bituminous waterproofing	✓			
Fully adhered system with exposed bituminous coating	✓			
Exposed vertical surfaces		✓		
Complex details			✓	

* Adhered with a contact adhesive on vertical surfaces



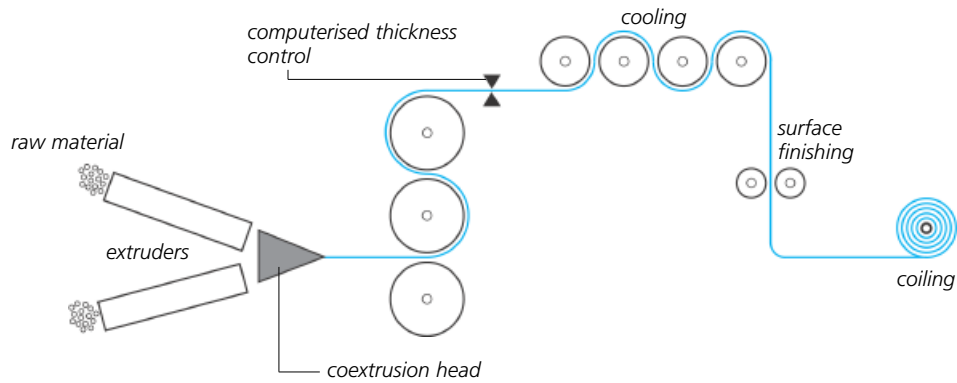


Manufacturing process

There are two main processes for Flagon TPO:

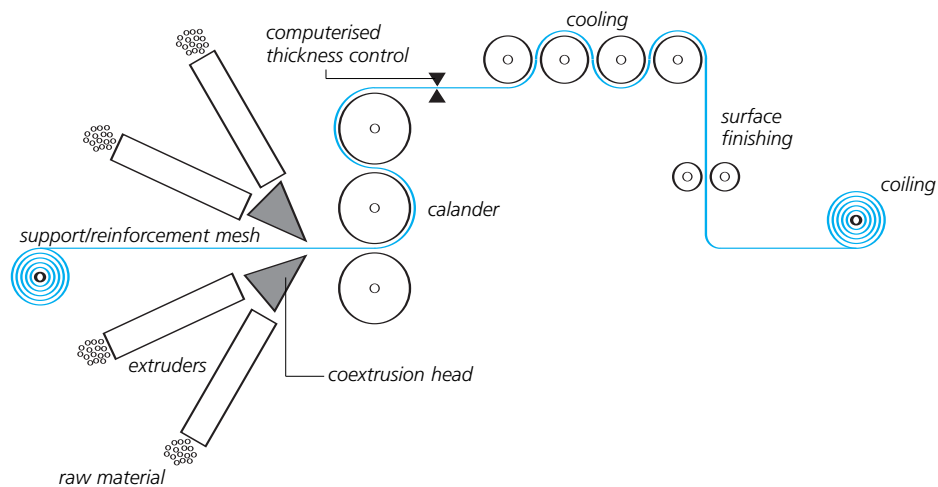
Co-Extrusion

Raw materials are passed through a chamber, heated and pressed into a co-extrusion head and then laminated. Membrane thickness is automatically adjusted to obtain a single-layer homogeneous, non-reinforced membrane with high tensile properties and high resistance to static and dynamic puncturing. This process can also produce a two-colour, single-layer membrane with a signal layer.



Tri-Extrusion

This technique was developed by and is unique to Flag-Soprema. The tri-extrusion is done in a single pass, encapsulating a reinforcement mesh to produce a complete homogeneous product with stability, high tensile strength, and an effective dual light/dark colour signal layer.





World class systems for single ply roofing

Copper Art® and Silver Art®

Flag-Soprema has combined the beauty of traditional materials with modern technology to create Copper Art®/Silver Art®, an easily installed membrane system that reproduces the beauty of traditional metal roofing. Fine metal powder (copper or aluminium) is incorporated into the membrane to give it the same aesthetic qualities as the metal itself.



Copper Art® and Silver Art® give you the aesthetic benefits of traditional metal roofing with the added benefit of reduced costs and the performance benefits that modern technology can provide. Risk associated with traditional metal roofing, such as cold bridging, airtightness, corrosion and water ingress at penetrations and details on low pitch systems, are eliminated.

Simple to install, Copper Art® and Silver Art® can be either mechanically fixed or bonded to the substrate. The result is a totally waterproof and virtually maintenance-free surface. As a lightweight system, it is ideal for new roof construction as well as large refurbishment projects, and is compatible with most supporting structures including timber, metal and concrete. Vapour retarders or barriers can be incorporated, together with insulation boards to comply with all necessary building standards and climate conditions.



Copper Art®

Copper Art® uses real copper powder combined with thermo-plastic to create a membrane that oxidises in the same way as traditional copper roofing. When exposed to the elements the membrane will gradually change with age, from a tawny brown to dark brown.



Silver Art®

Silver Art® uses aluminium particles as an integral part of the waterproofing membrane resulting in long-term stability of colour. Additionally, the UV reflectivity of Silver Art® reduces heat build-up within the system during summer months.





World class systems for single ply roofing

Environmental commitment

Flag-Soprema believes that sustainability should be the highest priority. That is why it is considered at each stage - during manufacture, when in use, and ultimately recycling or responsible disposal.

Today, all modern PVC production plant uses closed and integrated-cycle, automated production systems that concentrate on recycling by-products and reducing emissions.



TPO membranes are manufactured by processing polymers and additives in granular form. Powder and gas emissions are far lower than maximum average concentration acceptable in working environments, and the risk of accident during production is reduced. Water for plant cooling is re-circulated in a closed-circuit, again avoiding any chance of environmental pollution. The level of toxic substances emitted from manufacturing is so low that this is not considered a source of pollution, nor do the effects of weather, airborne pollutants or bacterial attack cause any significant pollutants from the membrane.

Disposal of Flagon membranes at the end of their life is either through:

Monitored Landfills

Flagon membranes are made from inert materials. Aerobic and anaerobic bacteria will destroy any plasticisers but will not attack polymers.

Incineration

Incinerators have active systems to recover electrical or thermal energy using the calorific power of the waste. Modern incinerators do not cause any significant pollution from Flagon membranes.

Recycling

Both PVC and TPO membranes are fully recyclable with no environmental impact in the process.



FS-Thermshield thermal insulation

High performance, CFC/HCFC-free rigid insulation

Our polyisocyanurate (PIR) and extruded polystyrene insulation boards ensure zero ozone depletion potential (ZERO ODP) and a global warming potential (GWP) factor of 3.

PIR insulation boards have a typical thermal conductivity of 0.027W/mK. They are used for warm roof applications.

Extruded polystyrene insulation boards have a thermal conductivity of 0.029 to 0.039W/mK. Their closed cell structure minimises water absorption and makes them suitable for inverted roof applications.

Sufficient ballast must be used (ie, paving slabs on supports, washed stone or green roofing) to prevent wind uplift and flotation.

FS-Thermshield F

A PIR insulation board with a foil facing on both sides, providing maximum thermal resistance for a minimum thickness.



FS-Thermshield G

A PIR insulation board with a mineral-coated glass-fibre tissue on both sides, providing a high thermal resistance for a minimum thickness.

FS-Thermshield MB

A PIR insulation board with bitumen-coated glass tissue on one side and a polypropylene finish on the other. The boards are 1m² in area for easy calculation of quantities required.



FS-Thermshield CTF

An un-faced PIR insulation board which is tapered to give falls of 1:60 or 1:80 as required.

FS-Thermshield EP H350

An extruded polystyrene insulation board with Zero Ozone Depletion potential using a HFA blowing agent. Its compressive strength is typically 350kPa at 10% compression.

FS-Thermshield EP N300

A completely environmentally friendly option. A Carbon Dioxide blown extruded polystyrene insulation board, with a compressive strength typically 300kPa at 10% compression.

FS-Thermshield EP LG-X

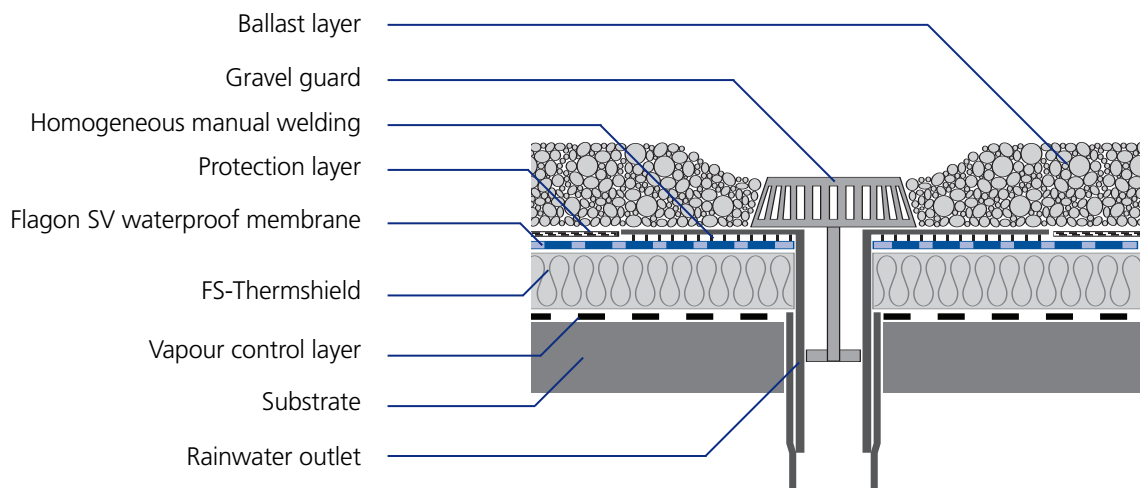
An extruded polystyrene board faced with a cementitious layer to protect the insulant. It is used in exposed locations such as upstands and in other locations where a self-protected board is necessary.



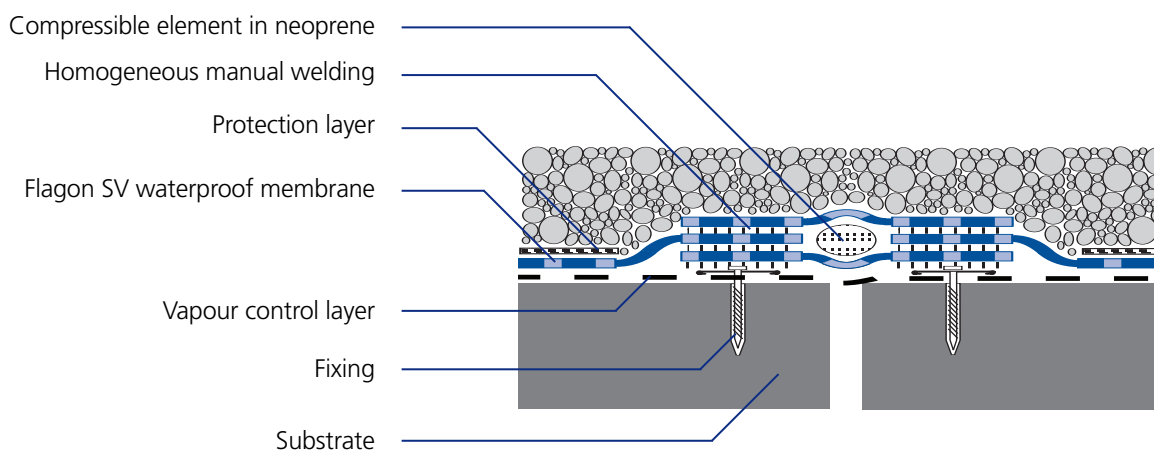
World class systems for single ply roofing

Flagon PVC application details

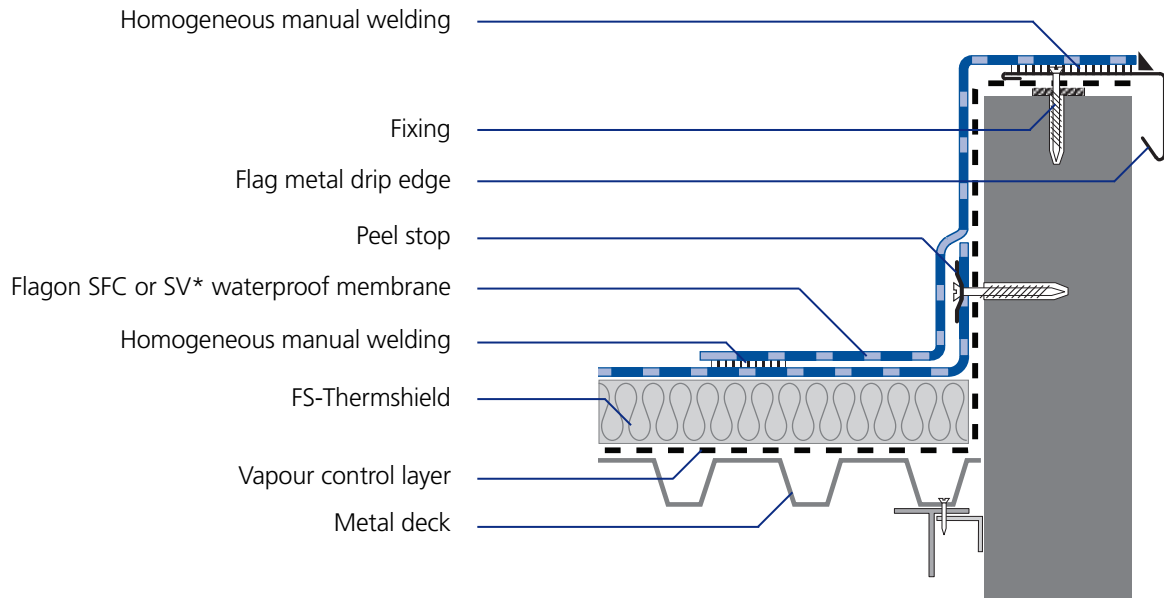
Rainwater outlet – in warm roof system with vapour control layer ballasted not for vehicular traffic



Expansion joint – uninsulated roof system ballasted not for pedestrian traffic

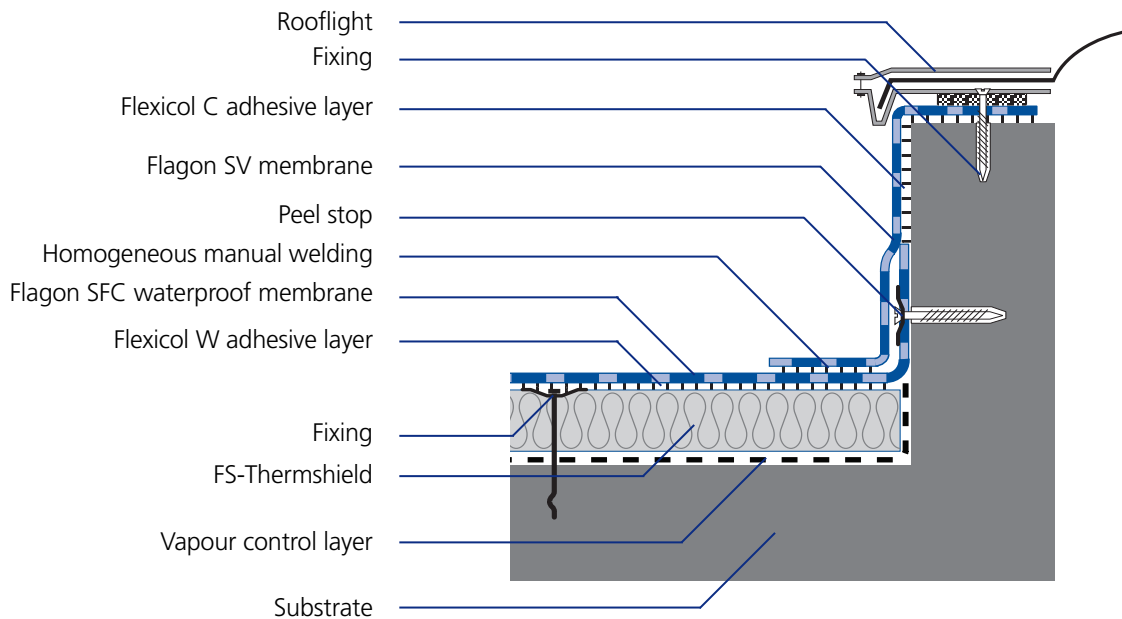


Drip-edge detail – warm roof system with vapour control barrier fully adhered



* The type of membrane to be used depends on the chemical compatibility with the thermal insulation element selected.

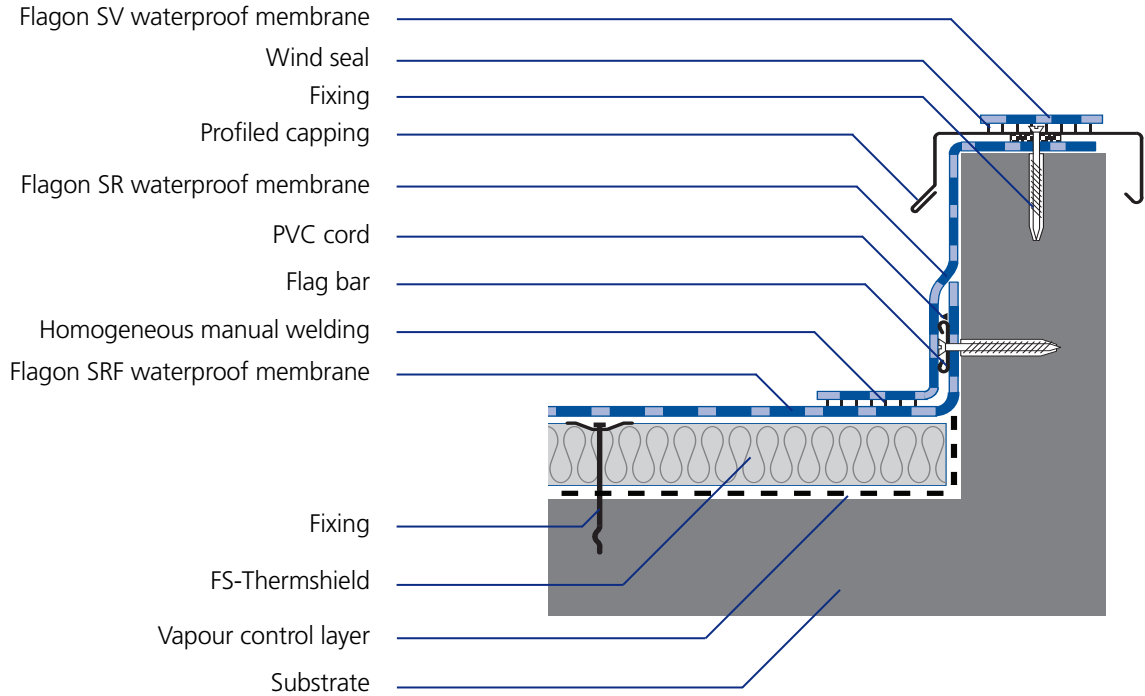
Rooflight detail – warm roof system with vapour control barrier fully adhered



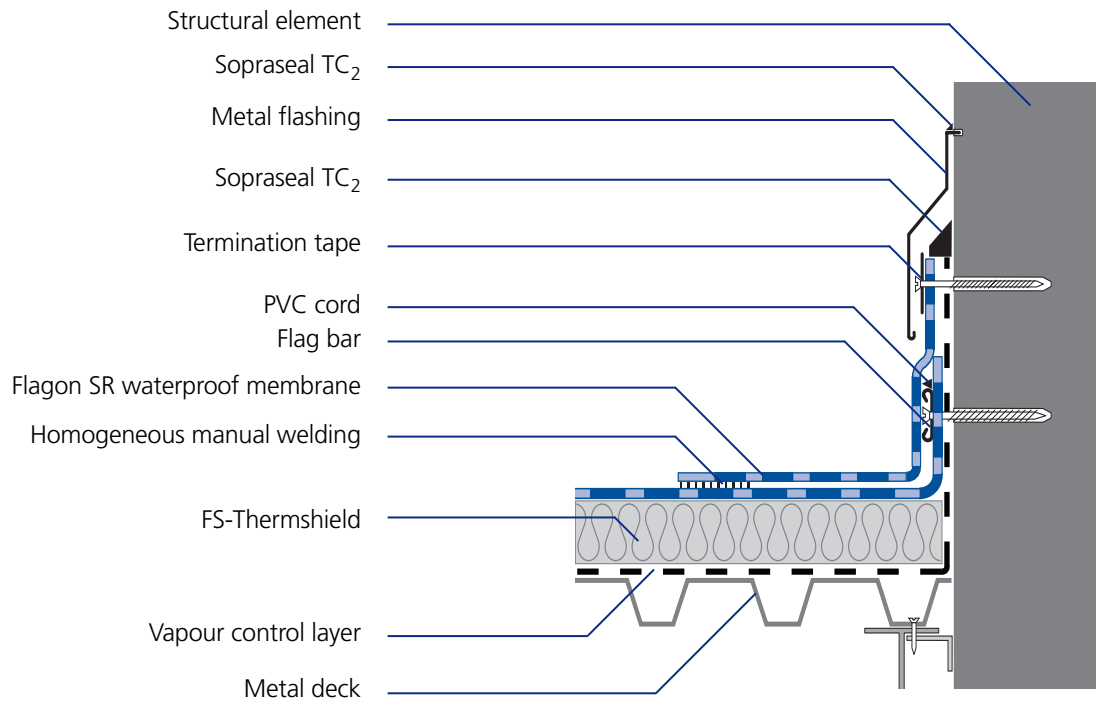


World class systems for single ply roofing

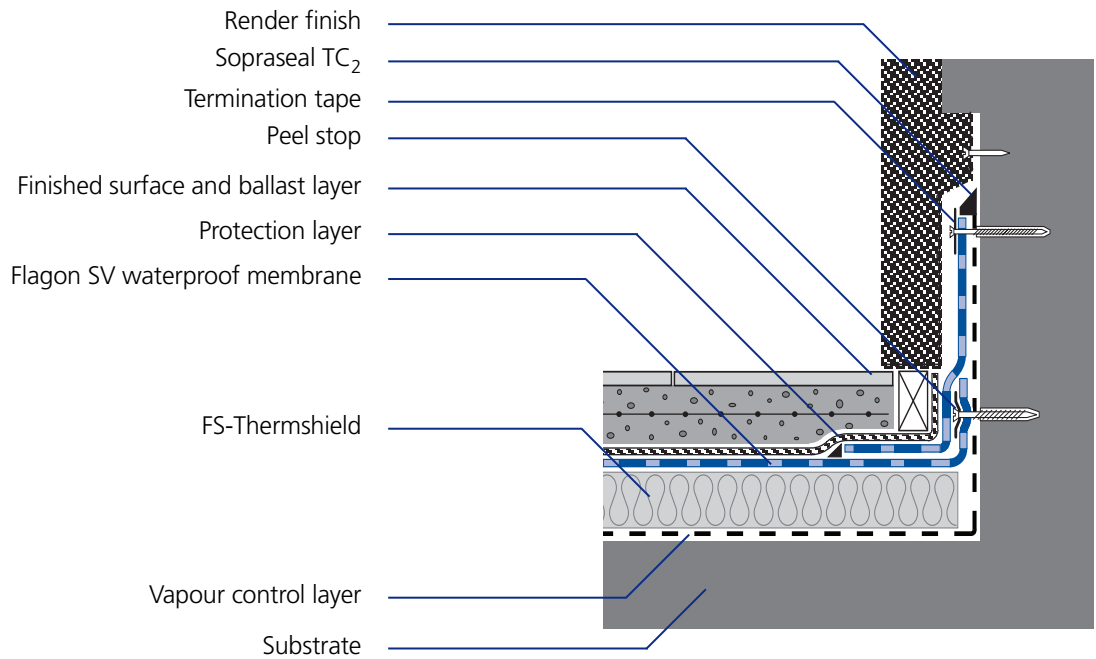
Capping detail with flashing – warm roof system with vapour barrier mechanically fixed



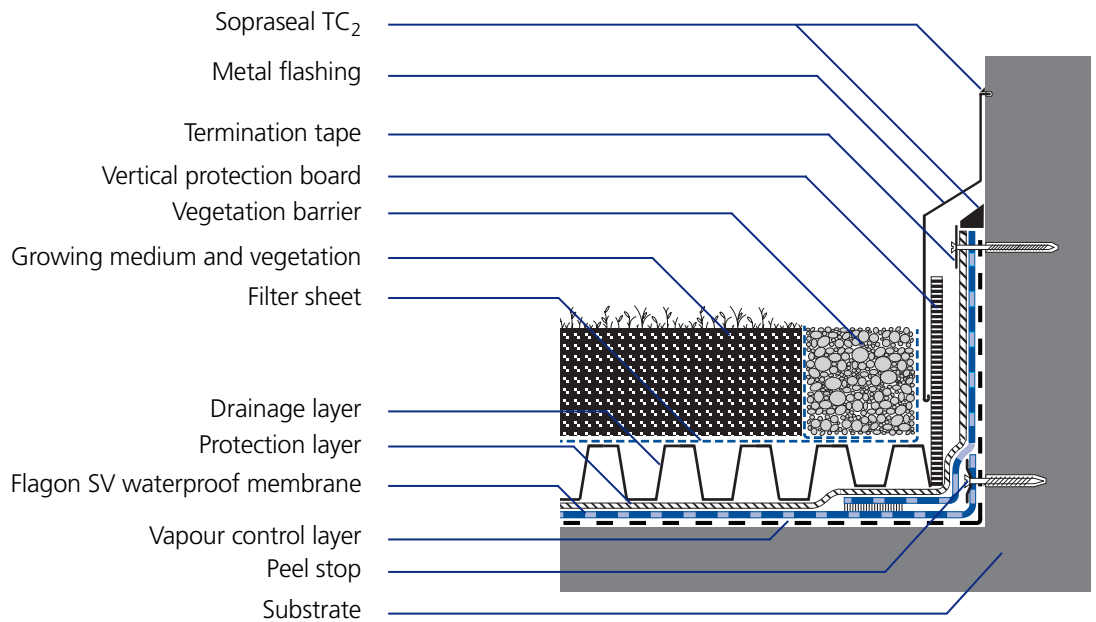
Uprand detail with flashing – warm roof system with vapour control barrier mechanically fixed



Rendered upstand detail – warm roof system with vapour control barrier ballasted for pedestrian traffic



Upstand detail – ballasted or green roof





World class systems for single ply roofing

Flagon PVC installation

Detailed Laying Instructions

Ballasted Roof System

The waterproof layers used for a ballasted roof system are laid independently of the substrate. Ensuring adequate overlaps, place the dry, waterproof layers in succession. If homogeneous membranes are laid (ballasting for vehicular traffic or roof garden), fix the waterproof sheets along the roof perimeter using a peel stop bar.

The positioning of the peel stop, horizontally or vertically, at the foot of the brickwork, is related to the existence and thickness of the insulation element, as well as to the nature of the substrate (eg, it cannot be made horizontally in the presence of light concrete piers).

Fully adhered roofing system

This laying method involves spreading Flexicol W single-component polyurethane adhesive over the substrate using a spreader or roller.

In these circumstances, Flagon PVC membranes are combined with a thermally treated geotextile, which performs two basic functions: it improves adhesion and distributes the stress and movements caused by the insulation element or by the structure.

Methods of laying differ according to the type of substrate on which the waterproof membrane is to be installed.

Uninsulated roof

Carry out a precautionary check ensuring the surface is clear, dry and as smooth as possible. The surface should provide adequate support for the proofing system.

The waterproof membrane is fixed directly to the substrate by means of Flexicol W polyurethane adhesive. The amount of adhesive required is approximately 300/350 g/m² (depending on the porosity of the substrate) and is applied using a spreader or roller.

Lay the waterproofing membranes, allowing an adequate side lap for welding. Once the horizontal sheets have been laid, complete the vertical upstand details (see Application Details, pages 15-17).

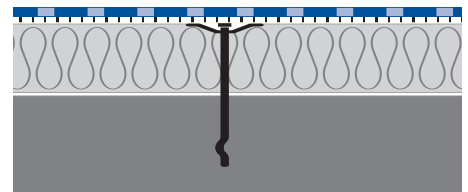


Roof with insulation boards

The insulation boards should be mechanically fixed (in compliance with the manufacturer's instructions) to the substrate by means of screws and washers.

Fleece-backed Flagon waterproofing membrane is then adhered to the insulation boards by means of Flexicol W polyurethane adhesive.

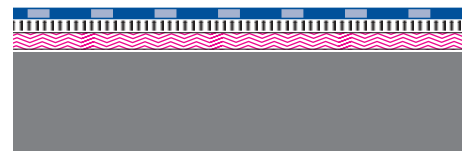
The amount of adhesive required depends on the type of board used, ranging from 300/400 g/m² and is applied using a spreader or roller.



Re-roof with bituminous layer

In this case, the existing bitumen has failed. Where there is an existing felt system with a mineral slate surface finish, the surfaces must be thoroughly cleaned before laying the new fleeced-backed Flagon waterproof membranes.

Proceed as described in the above paragraphs.





World class systems for single ply roofing

Exposed Roof (mechanically fixed)

Where the substrate comprises profiled metal sheet, the waterproof membrane should be fixed at right angles to the longitudinal rib of the metal profile. With a concrete substrate, the waterproof sheets can be laid in any direction.

The basic criteria for the fixing design are: nature of support, shape of the roof, building height, wind speed and topography.

Wind loadings affect all roof surfaces. Relevant criteria relate to three areas: perimeter, corners and field zones.

The distance between each single fixing and the number per m² for each area are established during the design phase of each project.

The section of membrane that is placed along the roof perimeter zone is most exposed to wind so it will always be necessary to include an extra fixing line with a Flag bar in galvanised steel at the foot of the perimeter upstand.

The corner zone is the most heavily affected by the wind and requires the largest number of fixing points. For more information and detailed calculations, please contact our Technical Services Department.

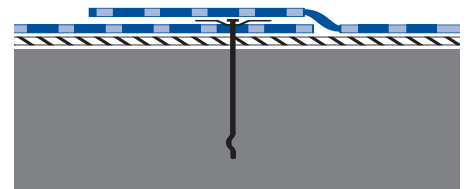
Mechanical fixing can be carried out by two different systems as described below.

Side lap fixing system

The reinforced waterproofing membrane is fixed through the deck/substrate by appropriate fixings and distribution plates.

The membrane is fixed along its outside edge at centres determined by the wind load restrictions.

Where additional fixings are required to the perimeter and corner zones, a further row of fixings can be installed along the centre of the membrane and then overlaid with a welded strip of membrane.



Bar fixing

This system is used if the type of substrate requires the positioning of fixings at pre-established centres owing to defects visible underneath the roofing.

Instead of distribution plates, a galvanised Flag Bar is used for all the fixing lines.

To protect the integrity of the waterproof membrane in case of damage from pedestrian traffic or continuous pressure caused by loading, steel bar end protectors are required at the junction of two bars.

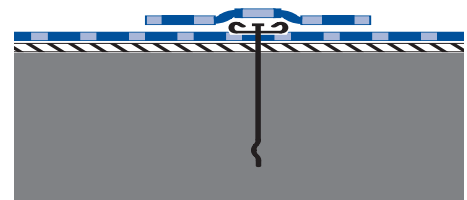
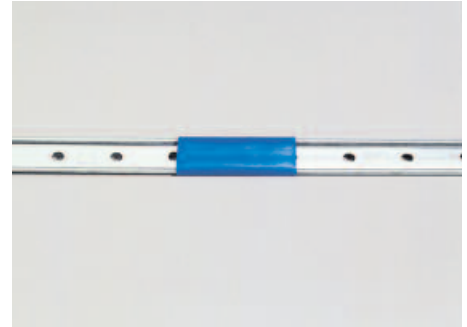
The bar fixing system enables the contractor to lay the waterproofing membranes on the roof and weld them together using an 800mm standard overlap.

Once in position the bars are fixed at pre-determined centres, using appropriate screws, to secure the membrane in place.

Once in place the bars are overlaid with a welded membrane cover strip.

The design must provide adequate drainage between the fixing bars to allow free flow of rainwater to down-pipes and channels.

Provide for adequate falls between the fixing bars to allow adequate flow of rainwater to downpipes and channels.

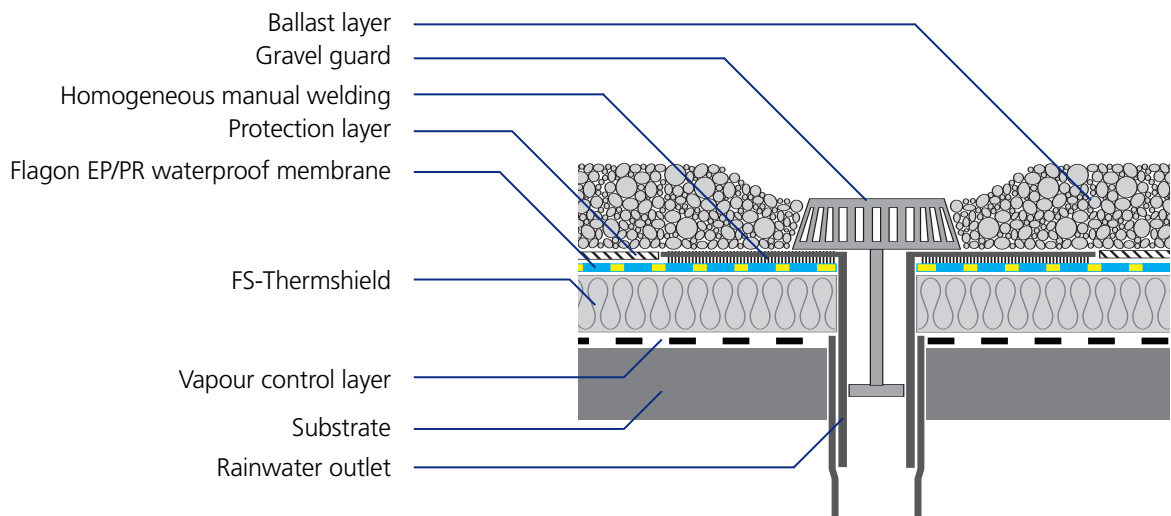




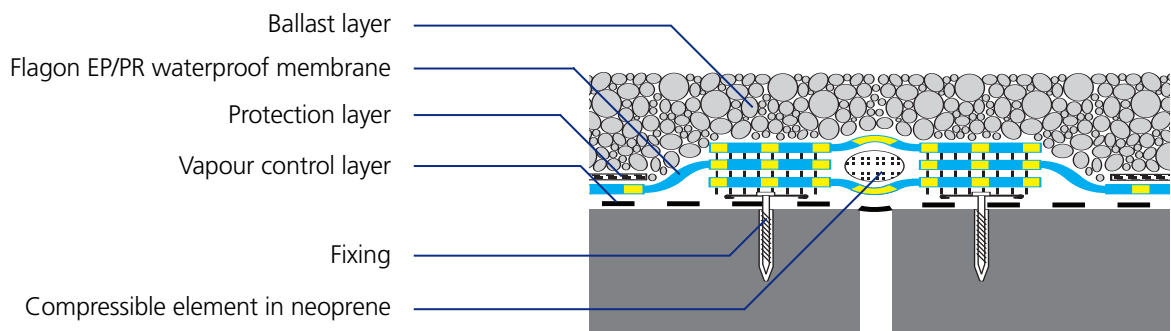
World class systems for single ply roofing

Flagon TPO application details

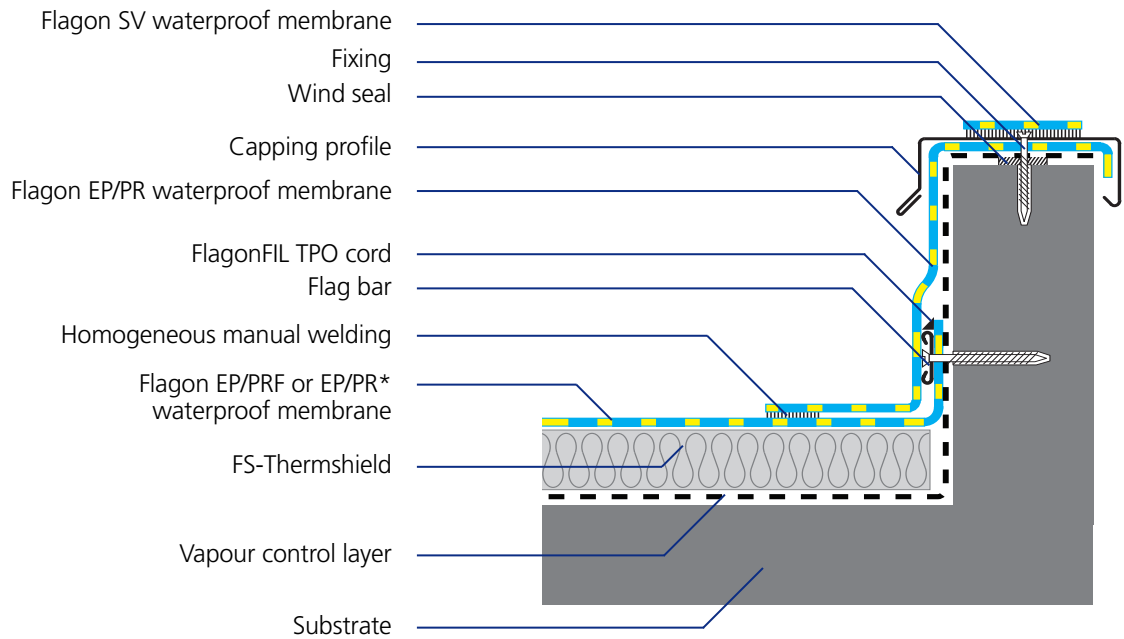
Rainwater outlet – in warm roof system with vapour control barrier ballasted not for vehicular traffic



Expansion joint in uninsulated roof – ballasted not for pedestrian traffic

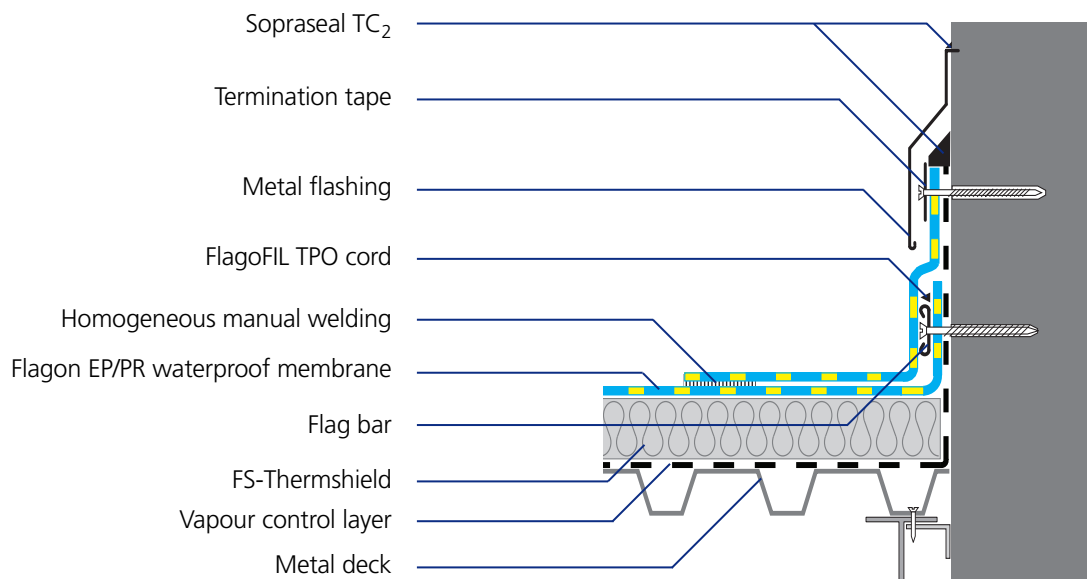


Capping detail – warm roof system with vapour control barrier mechanically fixed



* The type of membrane to be used depends on the chemical compatibility with the thermal insulation element selected.

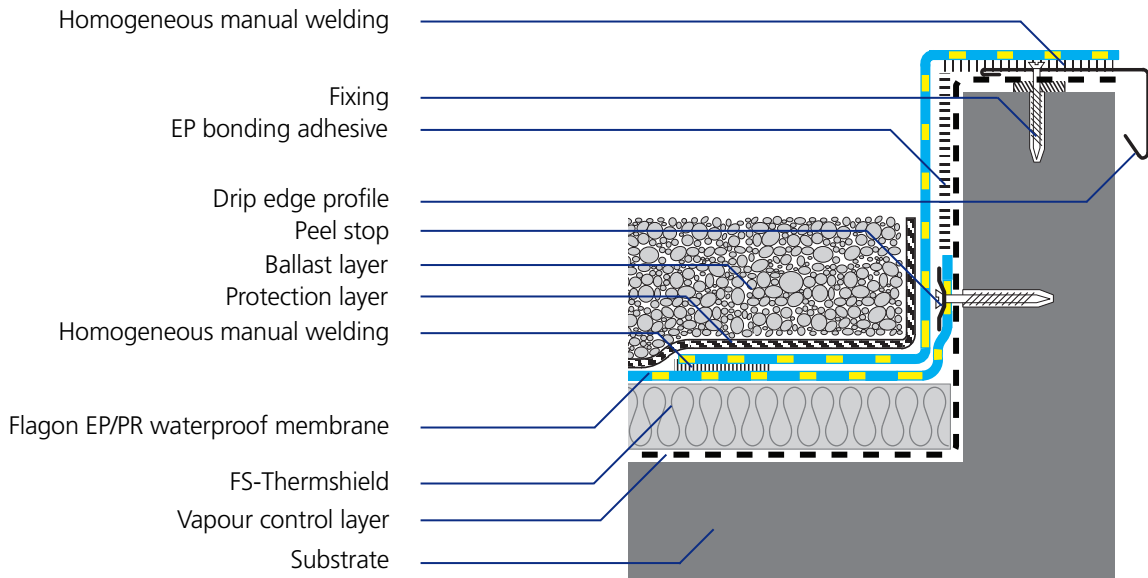
Upstand detail with flashing – warm roof system with vapour control barrier mechanically fixed



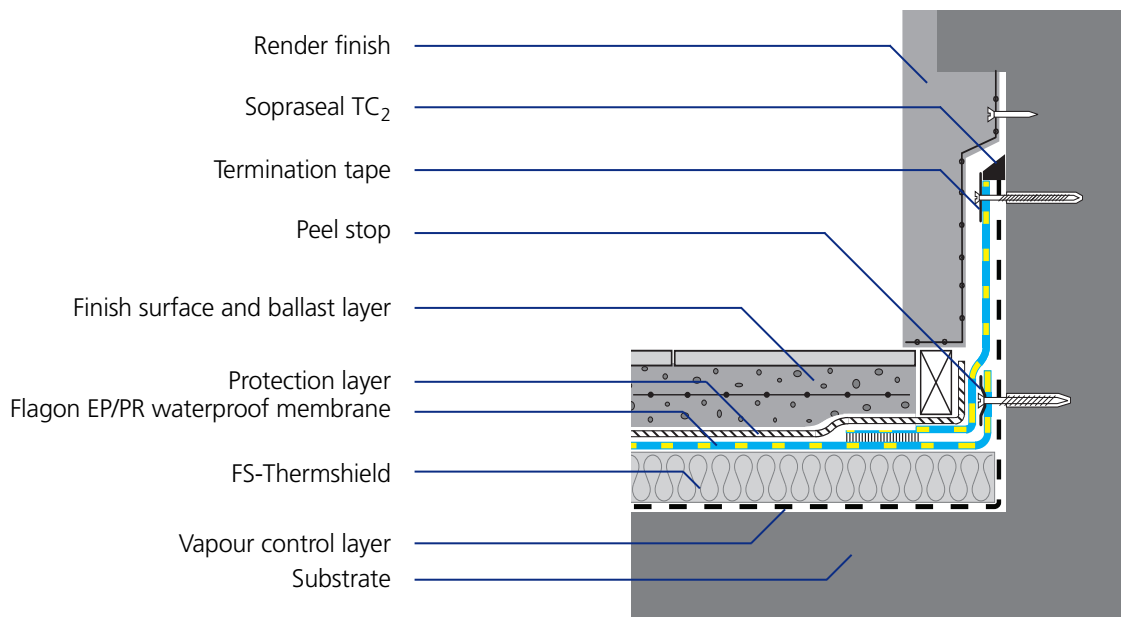


World class systems for single ply roofing

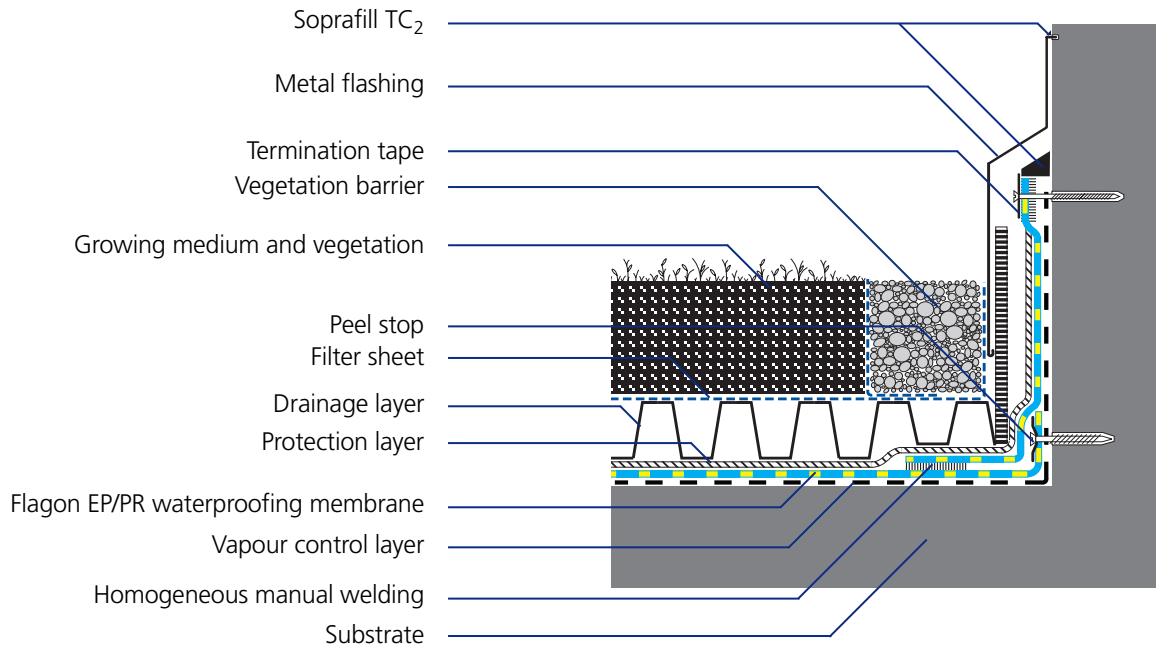
Drip-edge detail – warm roof system with vapour control barrier ballasted not for vehicular traffic



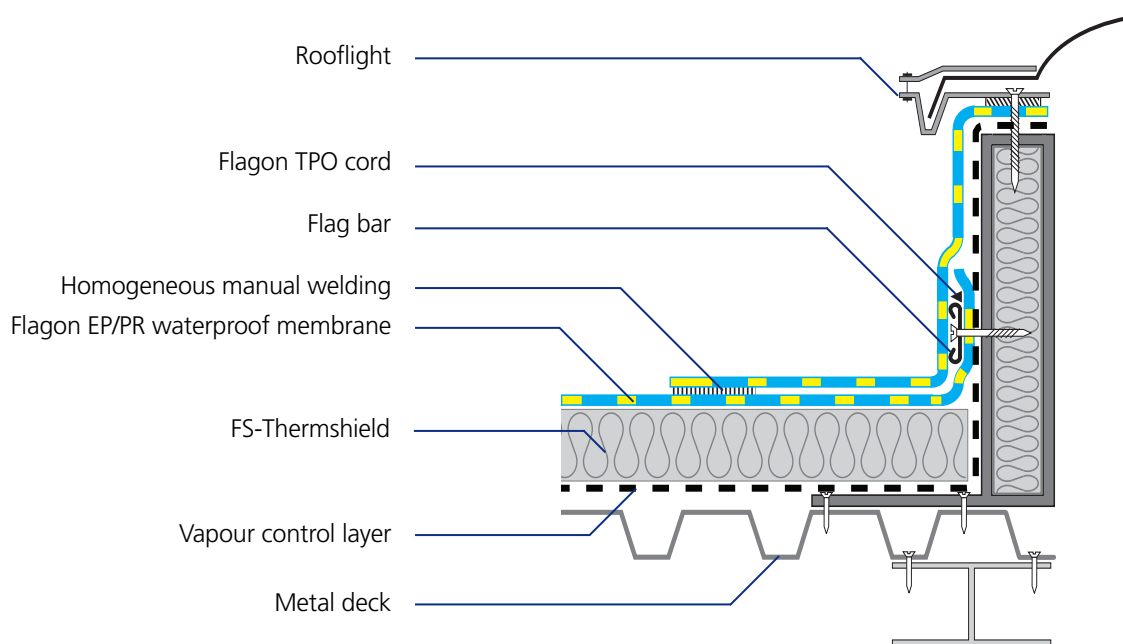
Wall junction with render – warm roof system with vapour control barrier ballasted for pedestrian traffic



Upstand detail – ballasted or green roof



Rooflight detail – warm roof system mechanically fixed with vapour control layer





World class systems for single ply roofing

Flagon TPO installation

GENERAL LAYING INSTRUCTIONS

1. Storage

Flagon TPO membranes are delivered to site in rolls, on flat, ventilated pallets.

They should be stored in a dry place and protected against dampness, rain and snow using waterproof sheets.

2. Perimeter fixing

Flagon TPO roofing systems must be fixed at all upstands, perimeters and protrusions with the appropriate Flagon bar.

The fixing can be made horizontally or vertically depending upon the substrate and design constraints. In each situation the introduction of the Flagofil TPO/PVC cord (see details on the previous page) is necessary.

Using the special nozzle, the cord is hot air-welded above the fixing bar (in the case of vertical fixing) or between the bar and the brickwork (in the case of horizontal fixing).

3. Sheet overlap

Requirements are as follows:

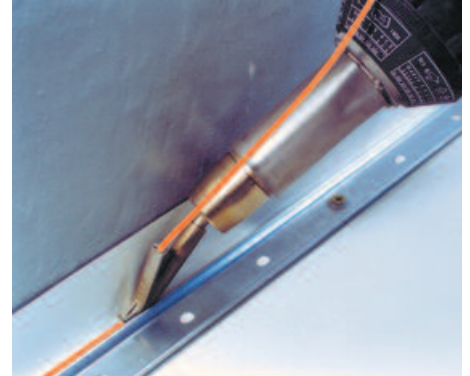
- a) Membranes for ballasted roof system, Flagon EP/PR and SV, minimum standard overlap 800mm.
- b) Membranes for mechanically fixed exposed roof system Flagon EP/PR and SR. The minimum standard overlap is 120mm.

4. Cleaning the welding lines

The surface of TPO liners can easily become electrostatically charged.

This considerably increases build-up of dust and impurities on welding seams; it is therefore necessary to clean them with a cloth soaked in Flagon TPO cleaner before welding.

This cleaning operation can be omitted only when roll laying and welding are carried out simultaneously.



5. Welding the sheets

Two types of welding system can be used:

- Manual hot air guns
- Automatic equipment

These welding systems are not mutually exclusive, but can be used together according to the specific requirements and characteristics of each waterproofing job. Regardless of the welding system chosen, the sheet overlaps must be clean and dry.

5.a Hot air manual welding

The welding follows three different phases: spot welding, pre-welding and finish welding.

Phase 1 – Spot welding

Spot weld the overlap, about every 400mm. Distance the spot welding from the edge of the lower sheet, by 60mm.

Phase 2 – Pre-welding

Weld the rear overlap so that a 30mm (using a 400mm nozzle) opening remains for the finishing weld.

Position the nozzle between the two edges at an angle of 45° to the welding line.

Roll at a distance of about 10mm from the nozzle.

Phase 3 – Finish welding

Weld at the edge of the upper layer, positioning the nozzle between the two edges at an angle of 45° degrees to the welding line. Roll at a distance of about 10mm from the nozzle.

5.b Automatic welding

Using automatic hot air welding equipment, a sample weld serves to check the basic settings of the welding temperature and speed before starting work on the waterproofing project.

Use of 'Flag scraper' nozzle

This scrapes the surface of the Flagon TPO membrane enhancing welding and avoids the necessity of cleaning with Flagon TPO cleaner.



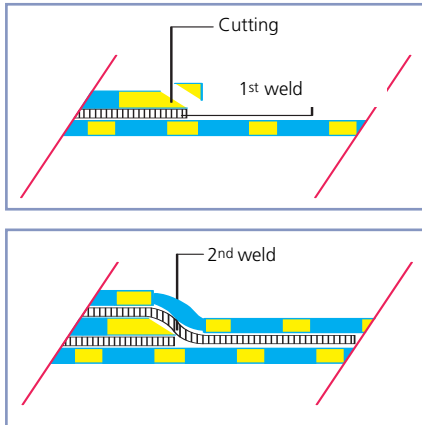


World class systems for single ply roofing

6. Preparing the weld overlap

When overlapping more than two layer of membrane (T joints) the leading edge of the welding seam should be chamfered or milled.

This also applies to the laying of prefabricated elements in Flagon TPO.



7. Use of accessories

To ensure perfect compatibility, use only prefabricated corners, fittings and unions from the Flagon TPO range which are made of the same compound as the waterproof membrane. Use a manual hot air gun to weld these to the Flagon TPO waterproof membrane.

8. Flagmetal Laminate

Flagon sheet metal laminated sections are easily fixed using expansion plugs (at least 250mm) and allow the covering to be directly welded to the section. In the case of flashings or cappings, expansion gaps should always be provided at joints to avoid the covering from tearing owing to linear expansion of the sections.

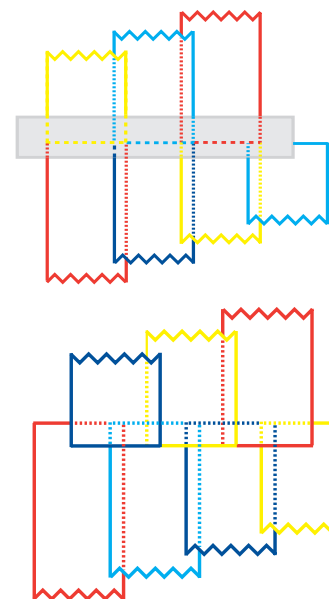
9. Overlapping the sheets

It is strongly recommended to round off sharp edges with cutter or scissors.

If the number of membrane layers is more than two, the leading edge should be chamfered (see point 6). If the sheet heads create 4-edge crossings, in addition to this chamfering you need to apply a round safety patch on the welding point.

Avoid multiple welding with more than three sheets. For this purpose:

- Lay a transverse sheet or strip (minimum width 200mm) across the bottom of two or more perfectly aligned and parallel sheets to provide a connection to the subsequent set.
- Offset each set of sheets transversely.



CHECKS

Checking Laid Surfaces (signalling effect)

The contrasting colours of the upper and lower surfaces of all Flagon TPO membranes allow the integrity of laid membranes to be checked.

If, during installation, the waterproof membrane has been in any way damaged or abraded, this will be readily apparent as the darker inner layer of the membrane will be exposed. This can then be easily remedied by welding a piece of the same material over the damaged area.

Checking of the Manual and Automatic Welding

Integrity of welding can be checked by mechanical, pneumatic or destructive testing.

a) Mechanical test (weld made by manual hot air gun or automatic equipment)

This is carried out by passing the rounded tip of a seam probe along the welding line, exerting an adequate pressure to identify any defect in the welded seam.

This operation is absolutely necessary to check the integrity of the welding and should be performed when the material is cold.

Defective areas should be cleaned with seam cleaner and re-welded or overlaid with Flagon TPO strip.

b) Destructive testing (hot air welded seams)

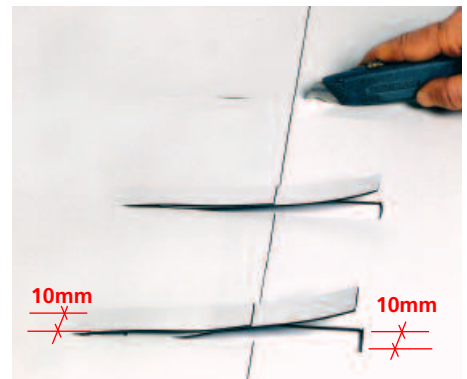
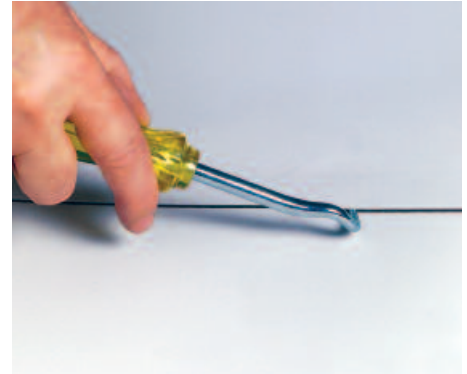
A destructive tensile test is carried out by peel testing a sample of the weld.

To do this, cut out a 10mm section of welded membrane.

Apply pressure to the weld by pulling on the two ends of the sheet as illustrated in the picture. The membrane must fail outside the welded seam.

This control must always be carried out each day on a sample weld before the installation of the waterproof membrane commences.

Note: The test, although manually performed on site, is based on the provisions set out in by the UEAtc Directive.





World class systems for single ply roofing

DETAILED LAYING INSTRUCTIONS

1. Ballasted roof system

The waterproof layers used for a ballasted roof system are laid independently of the substrate.

Ensuring adequate overlaps, place the dry, waterproof layers in succession.

Once the horizontal sheets are laid, form the vertical upstands and the details.

2. Exposed roof (mechanically fixed)

Profiled metal deck roofing, waterproof sheets should be laid in such a way as to cross the longitudinal rib of the metal deck at right angles.

With a concrete substrate, the waterproof sheets can be laid in any direction.

Wind force has different effects on the roof surface, which is why three areas of influence are distinguished: inside, perimeter and angle.

The distance between the single fixings, their density and the number required in the three areas of a roof are established during the design phase for each case.

The basic criteria for the fixing design are: nature of support, shape of the roof, building height, wind speed of the area, topography of the area.

The section of membrane that is placed along the roof perimeter is most exposed to wind so you always need to include a complementary fixing line with a Flag bar and cord at the foot of the perimeter brickwork.

The corner is the most heavily affected by the wind and obviously requires the largest number of fixing points.

For more information and detailed calculations, please contact our Technical Services Department.

There are two methods of mechanically fixing the membrane: fixing with plates and screws and fixing with Flag bar and screws.

When using trapezoidal metal decks the membrane must be laid at right angles to the deck direction.

2.1 Side lap fixing system

Fixing is carried out using proprietary fixing plates and screws along the edge of the membrane; fixing centres are determined by the building height and the topography of the area when subjected to wind loadings.

The distance between the plate and the edge of the membrane should be 10mm.

The adjoining membrane overlaps the fixed sheet by a minimum 120mm thereby encapsulating the fixing line.

Both membranes are then welded using automatic or manual welding methods to form a homogeneous seam.

In areas of high wind exposure it may be necessary to increase the fixings to the perimeter and corners zones.

This is achieved by installing a further row of fixings along the centre of the membrane followed by a welded cover strip.

Flag-Soprema mechanically fixed roofing systems are design specific.

For information regarding fixing plates and screws together with wind load calculations, please contact our Technical Services Department.

2.2 Bar fixing

Flag bar and screws are installed at pre-determined centres according to wind load requirements of the local area and the building height.

When using insulation boards they must be fixed independently to the membrane.

The fastening lines are placed parallel to the lengthwise axis of the line. Instead of distribution plates, the Flag bar is used for all the fastening lines, not only for those at the foot of the vertical elements.

To protect the integrity of the waterproof membrane in case of damage caused by pedestrian traffic or continuous pressure caused by overloads, with this fastening system, you always need to insert the Flag bar end protectors at the junction between two adjacent bars.

This system enables the contractor to lay the waterproofing membranes on the roof and weld them together using a 80mm standard overlap.

Once in place the bars are overlaid with a welded strip of membrane.

The design must provide adequate drainage between the fixing lines to allow free flow of rainwater to down-pipes and channels.

In order to prevent wind moving or damaging the membrane during the installation this operation must be carried out during the laying of the membrane.

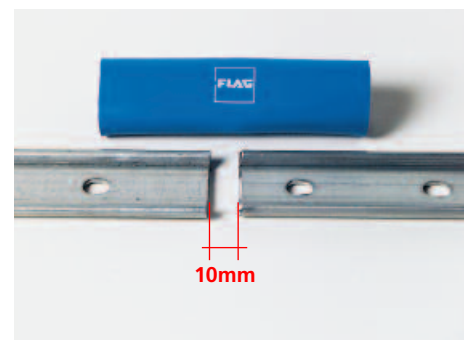
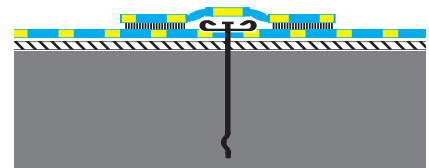
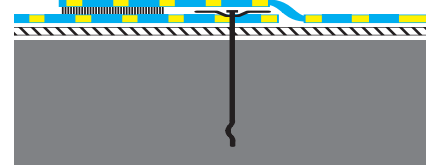
Provide adequate drains between the fixing lines to allow the outflow of rainwater to down pipes and channels.

3. Fully Adhered Roof (exposed)

For fully adhering, use of Flexicol W adhesive. Using a spatula or roller, spread the adhesive onto the substrate.

Spot-weld, pre-weld, and finish weld the membranes.

Note: Avoid contaminating the welding edge of the membrane with adhesive. Any adhesive spots or residue can be removed with Flag PVC/TPO cleaner and a clean cloth.





World class systems for single ply roofing

Our systems

Metadeck – profiled metal roofing

Flagon PVC/TPO – single ply membrane

Alsan RS – cold-applied liquid resin

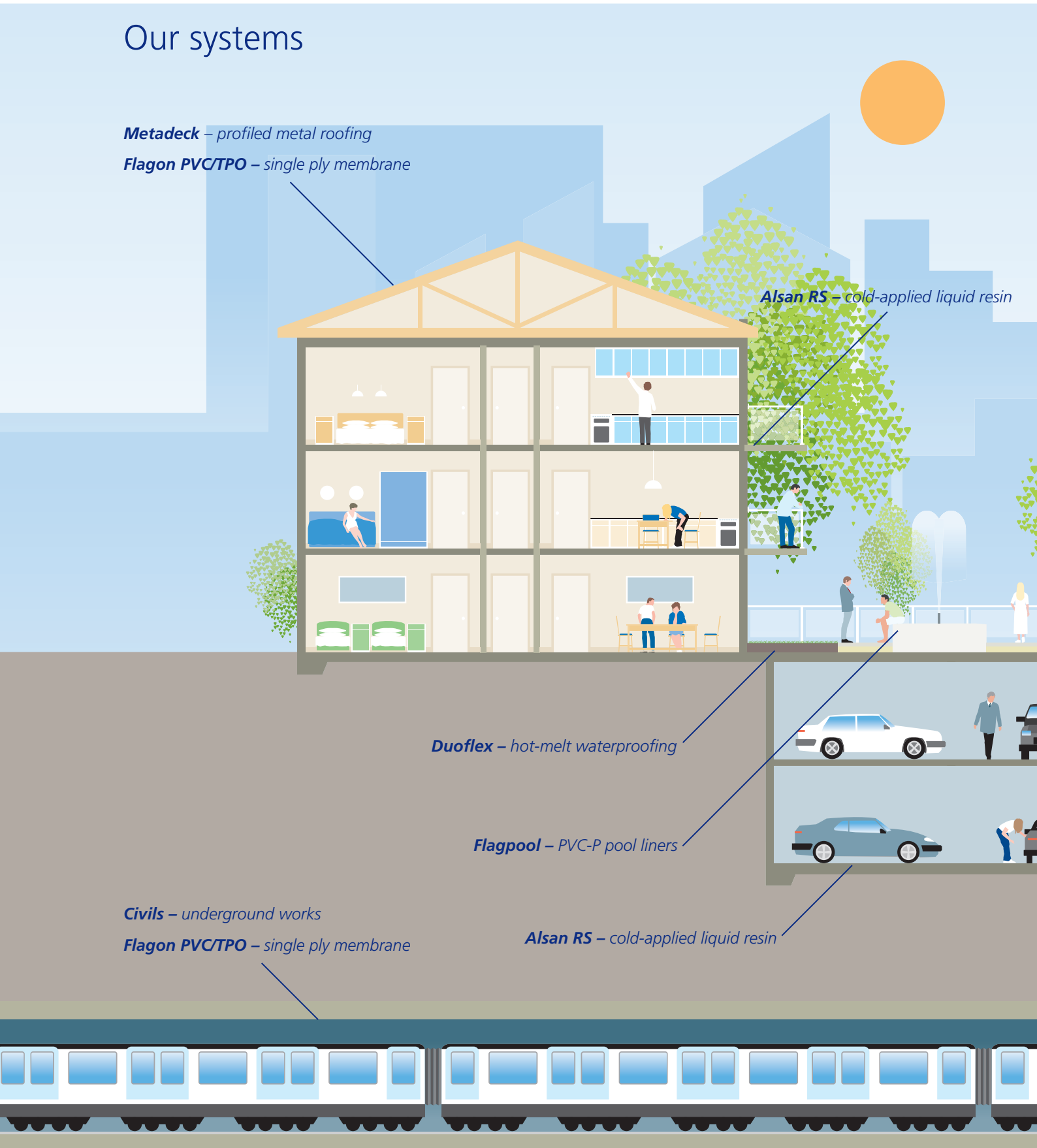
Duoflex – hot-melt waterproofing

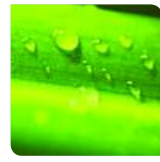
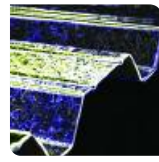
Flagpool – PVC-P pool liners

Civils – underground works

Flagon PVC/TPO – single ply membrane

Alsan RS – cold-applied liquid resin





Metadeck – profiled metal roofing

Sopralene – elastomeric waterproofing

Elastophene – elastomeric waterproofing

Flagon PVC/TPO – single ply membrane

Alsan RS – cold-applied liquid resin

Optigreen – green roof solutions

Duoflex – hot-melt waterproofing

Sopralene – elastomeric waterproofing

Elastophene – elastomeric waterproofing

Flagon PVC/TPO – single ply membrane

Alsan RS – cold-applied liquid resin

Alsan RS – cold-applied liquid resin



World class systems for single ply roofing

Other Flag-Soprema systems



Sopralene
Elastomeric Waterproofing

Sopralene

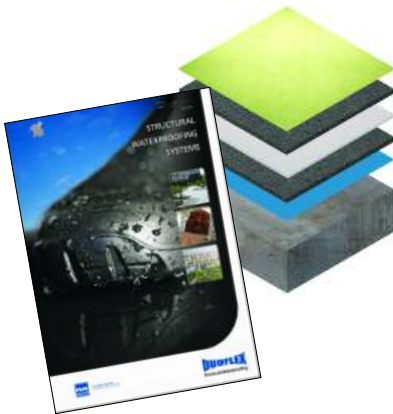
Sopralene elastomeric waterproofing is a comprehensive range of torch-on heat-activated membranes comprising two principal components:

- Expertly blended SBS elastomeric bitumen
- High resistance polyester reinforcement



Sopralene is used for roof and general waterproofing, including basement walls, in both new and refurbishment projects. Products are covered by BBA Certificates and are also technically approved by national test laboratories in France, Germany, Switzerland, Belgium, Canada, USA and Japan.

DUOFLEX
Structural Waterproofing



Duoflex®

The Duoflex Structural Waterproofing System is a hot-melt system, which provides a strong, durable, flexible, lightweight and self-healing monolithic barrier to the transmission of water and water vapour. Designed to last the lifetime of the structure to which it is applied, it eliminates future maintenance and gives rise to particularly low life cycle costs.



Duoflex is an environmentally friendly formulation of rubberised bitumen, modified with SBS styrene butadiene polymer resins, supplied in solid blocks ready for melting on site. It offers superior mechanical properties and has minimal environmental impact.

Duoflex is designed to retain its durability and elasticity, absorbing repeated movements and stress within the structure.



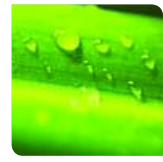
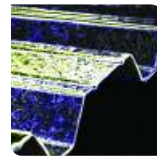
Alsan

The Alsan RS range of cold-applied liquid resin systems offers cost-effective, loadbearing, high-performance seamless, waterproofing. It is ideal for roofs, general waterproofing, parking decks, balconies, patios, terraces, pedestrian areas, wet rooms and repairing existing roofs.

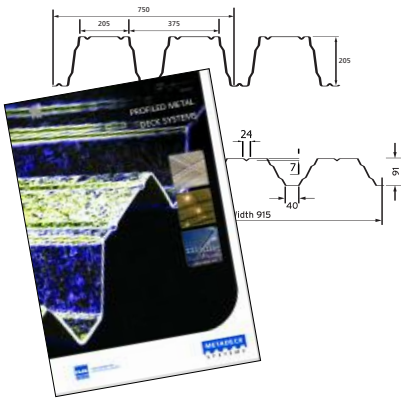
The Alsan RS range uses PMMA (polymethyl methacrylate) resin technology. The dramatically fast cure time ensures that the installation can accommodate tight construction schedules.

The waterproofing system is extremely flexible and adheres fully to the substrate, creating a homogeneous waterproofing layer, perfectly fitted to the contours of the roof. This means that applications can be warranted for up to 20 years.

ALSAN
Liquid Coatings



METADECK SYSTEMS



Metadeck

Metadeck profiled metal roofing systems are manufactured to provide optimum performance combined with a high degree of design flexibility to realise exciting construction opportunities.

They are manufactured from the finest, high quality galvanised steel and aluminium and are available in both un-perforated and web-perforated forms.

The steel is galvanised to EN 10147 S320GD + Z275 and can be supplied in a range of gauges, including 0.75mm, 0.88mm, 1.00mm, 1.13mm, 1.25mm and 1.50mm. The aluminium 3004 grade is available in 1.25mm and 1.5mm gauge, with a standard internal finish of off-white 15-micron RAL 9002 polyester.

OPTIGREEN® ROOF GREENING



Optigreen®

Optigreen systems are the perfect way to create sustainable green roofing solutions, promoting biodiversity and incorporating thermal insulation, vapour control layers, drainage and filtration layers.

Optigreen Extensive roofs are low-maintenance, eg, with grasses and sedums, and are accessed for routine maintenance only. Optigreen Intensive roofs can include shrubs and small trees, and are intended for frequent recreational use, eg, roof gardens.

Modern green roofs have been in existence for around 35 years and Optigreen was one of the first major innovators in green roof design. All Optigreen roofs are backed by a comprehensive quality system in accordance with ISO 9001 and are certified to FLL standards for green roof systems.



Sopracover warranty scheme

Sopracover offers major advantages over other warranties of a similar type, covering consequential loss, product liability, design liability and workmanship. It is provided on the basis that the work is carried out by a Flag-Soprema Approved Contractor, specifically chosen by Flag-Soprema representatives for the high quality of workmanship and knowledge of the Flag-Soprema waterproofing systems.

Sopracover has the following features:

- The insurance is provided by a major insurance company, actionable and bound by UK law.
- It is more than a marketing tool, being based on proven world-class products.
- The waterproofing materials have been independently tested and have been shown to have a life expectancy of 'at least 30 years'.
- Cover is maintained if Flag-Soprema or the roofing contractor cease to trade.
- The insurance cover is transferable to any new building owner.
- An individual warranty certificate is issued for every project, complete with component listings.
- No compulsory maintenance agreements are required from the installer, and no costs relating to the warranty are demanded from the beneficiary.
- Inspections are carried out by Flag-Soprema throughout the warranty period, at year 10 and 20.

Sopracover includes:

- Payment of the cost of materials and labour to rectify any failure in the waterproofing products or their design and resultant damage to the roofing system.



Flag-Soprema
Unit 640
The Hub
Avenue West
Skyline 120
Great Notley
Essex CM77 7AA
United Kingdom

T: +44 (0) 845 1948727
F: +44 (0) 845 1948728

E: enquiries@flag-soprema.co.uk
W: www.flag-soprema.co.uk



YOUR ROOFING AND
WATERPROOFING PARTNER