Issue 4 - June 2017

System Installation GUIDELINES

IKO armourplan® PVC

IKO polymeric®
Excellence in Polymer Technology

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1 Introduction

About the IKO Group

IKO is a family owned company that has been committed to manufacturing quality residential and commercial roofing products since 1951. Our company motto is "Setting the Standard" and that's what we do; set the standard for quality, durability and innovation.

The IKO Group is a global leader in the manufacture and supply of roofing and waterproofing products. Group headquarters are in Alberta, Canada, with production carried out at plants throughout North America and Europe.

In the UK, IKO PLC embraced some of the most respected and long-established brands in the marketplace, including Ruberoid Building Products, Permanite Engineered Roofing Systems, Permanite Asphalt, Marley Waterproofing, Hyload and SpectraROOF Single Ply Engineering.

IKO polymeric®
Excellence in Polymer Technology

IKO
Setting the standard

IKO PLC's product range includes:

- Polymeric Single Ply Systems
- Monolithic Hot Melt Roofing Systems
- Reinforced Bituminous Membrane Systems
- Mastic Asphalt Systems
- Green Roof Systems
- Insulation Materials and Roofing Accessories
- Pitched Roof Protection Systems
- High Performance DPC & Cavity Tray Systems
- Below Ground DPMs & Tanking Systems
- Waterproofing Solutions & Compounds

IKO Polymeric UK Manufacture

IKO Polymeric manufactures the latest generation of polymeric single ply membranes, including PVC, TPE systems and associated ancillaries.

IKO Polymeric membranes are manufactured in a purpose built, state-of-the-art manufacturing facility based in Chesterfield, UK. Substantial investment in the latest extrusion technology and computer controlled manufacture ensures consistently high quality membranes are produced while also saving on energy and wastage.

Key Benefits

- Dedicated UK-based manufacturing unit
- BS EN ISO 9001* accreditation
- BS EN ISO 14001* accreditation
- BS EN ISO 6001* accreditation
- Extensive range of products
- Complete system offer
- Trained technical support staff
- Stringent product testing procedures.

As a global leader in the manufacture and supply of waterproofing, roofing and insulation materials, IKO Polymeric is committed to minimising its environmental impact. IKO Polymeric takes responsibility for the effects its business has on the planet. From planning and paperwork, to our manufacturing processes and materials, distribution and use, we consider the environmental impacts throughout the product lifecycle.

IKO Polymeric's UK manufacturing plant is built using recycled building materials and is designed in accordance with BREEAM**, the world's leading and most widely used environmental assessment method for buildings.

It also re-uses byproducts from manufacture, wraps products in minimal packaging and employs a streamlined transportation network.

All polymeric materials offered by IKO Polymeric are resistant to weathering, chemical oxidation and UV radiation which ensures long term durability, a key factor in environmental sustainability.

* ISO9001 is the International Standards Organisation Standard for Quality Management Systems. ISO14001 is the International Standards Organisation Standard for Environmental Management Systems.

* ISO6001 is the International Standards Organisation Standard for responsible sourcing.

**Building Research Establishment Environmental Assessment Method.

Armourplan PVC Membranes

Armourplan PVC is produced in a range of different membrane 'types' designed for specific applications:

- **Armourplan SM**
  Armourplan SM is a polyester scrim reinforced membrane for mechanically fastened roofing systems. The membrane is mechanically fastened in the overlap using IKOfix Stress Plates and IKOfix Screws, the fixing passes through the insulation and vapour control layer into the deck. Overlaps are hot air welded. Armourplan SM can also be used for ballasted systems or alternatively on adhered systems using contact adhesive. Armourplan SM or Armourplan G is also used as the upstand detailing membrane on all Armourplan SM systems. Available in either 1.2mm or 1.5mm thickness.

- **Armourplan SG**
  Glass tissue reinforced fleeced backed membrane for bonded roofing systems. The membrane is bonded to the substrate using Spectrabond low foaming PU Adhesive or IKOpro Sprayfast FMA. Side laps are hot air welded. End laps are butt jointed and waterproofed with a cover strip. Available in 1.2mm thickness.

  Armourplan SM or Armourplan G is used as the upstand detailing membrane on all Armourplan SG systems.

- **Armourplan P**
  Polyester-reinforced membrane suitable for use in a wide range of roofing applications on both flat and sloping roofs. Armourplan P offers enhanced mechanical properties over standard PVC membranes and is completely UV stable throughout. Armourplan P can be mechanically fixed, adhered or ballasted and all overlaps are heat welded using suitable hot air welding equipment. Available in either 1.2mm thickness.

  Armourplan P or is used as the upstand detailing membrane on all Armourplan P systems.

- **Armourplan PSG**
  Glass tissue reinforced polyester fleece backed membrane and is completely UV throughout and is used for bonded roofing systems. The membrane is bonded to the substrate using Spectrabond low foaming PU Adhesive or IKOpro Sprayfast FMA . Side laps are hot air welded. End laps are butt jointed and waterproofed with a cover strip. Available in 1.2mm thickness.

  Armourplan P is used as the upstand detailing membrane on all Armourplan PSG systems.

  The Armourplan membrane range is provided in two standard colours; mid grey (RAL 7046) and slate grey (RAL 7015).

Tools & Equipment

- **Hot Air Hand Welders: -** Quality hot air hand welding tools are available from Leister Triac and Sievert. These tools are lightweight and have a digital temperature display showing 'set' and 'actual' air temperatures up to maximum 600°C. The recommended welders have stepless electronic temperature control and are available in both 110v and 230v.

- **Automatic Hot Air Welders: -** Suitable machines are available from both Leister, Bak or Sievert, and weigh approximately 25kg. The digital temperature display shows 'set' and 'actual' air temperatures up to a maximum 660°C. Maximum welding speeds are between 5 to 7 metres per minute. These machines have stepless electronic temperature and welding speed control. The independent suspension pressure roller ensures consistent distribution of pressure on uneven substrates.

SAFETY NOTE

As with any light coloured surface membrane, it is advisable to take precautions to avoid any harmful effects caused by working in direct sunlight during installation.

- **Nozzles -** A 40mm wide nozzle should be used where stresses occur on the membrane laps e.g. in the field zone. The 20mm wide nozzle is used for welding laps located at intricate detailing e.g. internal corners, and are interchangeable with the hand welders outlined above.
- **Seam Pressure Roller -** 40mm wide silicone roller for providing pressure to welded laps.
- **Penny Pressure Roller -** 6mm brass roller for providing pressure to welded detailing.
- **General Tools -** Armourplan PVC membranes are generally cut using scissors although a flat bladed knife can be advantageous at detailing. A wire brush is required to remove polymer deposits from welding nozzles. Wide paintbrushes or compatible application rollers are suitable for application of Armourplan PVC Contact Adhesive. A chalk line should be used to mark the membrane prior to cutting. Tape measures should be used to ensure consistency of lap widths. Welded seams should be checked using a suitable seam check tool.

A chamfer tool is also used on 1.5mm and 2.0mm Armourplan membranes. This is an edge trimming plane used for chamfering the square edge of a seam.

Storage Guidelines

Once delivered to site the membrane should be protected against exposure from rain and site dirt.

When stored in clean & dry conditions the Armourplan membrane needs no additional cleaning.

Cleaning Regime

Clean - Unwrapped, installed and welded immediately.

Soiled - Contamination from building site dust & dirt.

Heavily Soiled - Extensive exposure to contamination from moisture, building site dust & dirt.

Clean Armourplan PVC -
No action required

Soiled Armourplan PVC -
actions 1, 2, 3 & 5

Heavily Soiled Armourplan PVC -
actions 1, 2, 4 & 5

1. Wash/scrub membrane with soapy water
2. Allow to dry
3. Clean with PVC membrane lap preparer

4. Clean with Armourprep Preparation Solution (acetone)
5. Allow to fully dry (time depends on ambient temperature and amount applied)

Note: The weather conditions prior to welding will have an affect on the required cleaning regime (e.g. membrane exposed to prolonged wet periods may result in the need for the use of Armourprep)

Test welds to be carried out to verify that cleaning regime has proven to be adequate.

If the membrane becomes wet or soiled after or during preparation then the cleaning regime is to be repeated.

Day Joints

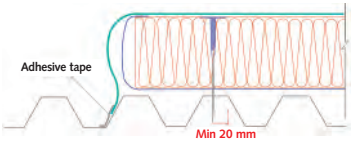
Day joints help to protect from water ingress under incomplete areas roof.

The day joints should be installed when work is either interrupted due to adverse weather or at the end of each working day.

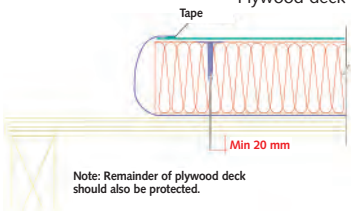
IKO Polymeric would always recommend good roofing practice and promote that only areas that can be completed that day should be laid and that detail work is completed as the roof progresses.

The diagrams opposite show typical methods of sealing day joints.

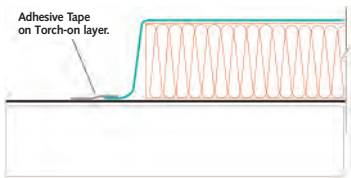
Metal deck



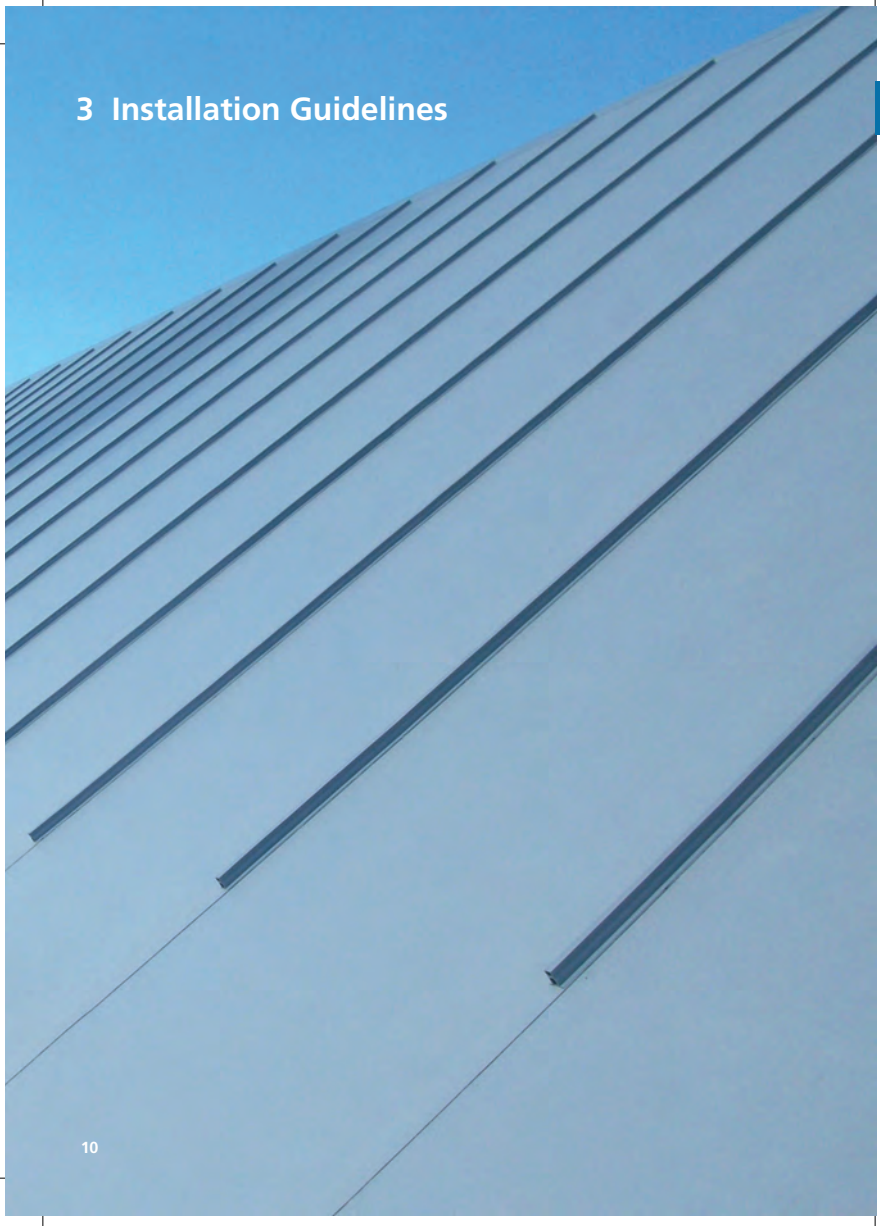
Plywood deck



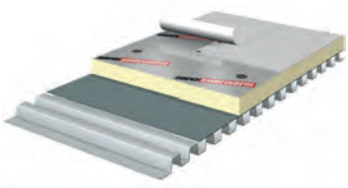
Concrete deck



3 Installation Guidelines



Mechanically Fastened Roofing System



Installation Guidelines - Armourplan SM and P

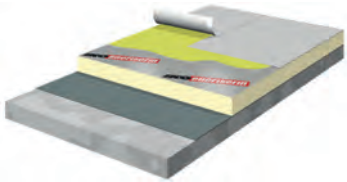
1. Carefully unroll the Armourplan SM or P out over the previously prepared substrate. If installing on a profiled metal deck ensure that the membrane is perpendicular to the direction of the deck sheet.
2. Install the IKOfix fasteners, using an appropriate installation tool 30mm from the rear edge. Fasteners must be installed at the fixing centre's specified by IKO Polymeric for the specific project.

3. Unroll the next roll of Armourplan SM or P ensuring the end laps are staggered and the side overlaps the previously installed sheet by a minimum 110mm.
4. Hot air weld the side laps with an automatic welder or hot air gun and allow to cool completely.
5. Mechanically check the integrity of the cooled weld by running a seam probe along the seam applying pressure into the seam.
6. In corners and other areas where additional fastening is required install IKOfix fasteners through the roof sheet and cover with a 200mm wide strip of Armourplan SM or P. Hot air weld both sides and ends.
7. At upstands and at all roof penetrations secure the Armourplan SM or P membrane with a toothed bar.
8. Cover 10mm gap in the toothed bars with a 50mm x 50mm piece of Armourplan SM or P and weld to the roof sheet.
9. Waterproof the toothed bar with the upstand flashing hot air welded to the roof sheet.

NB: This is a guide only – please refer to Armourplan Application Manual for Contractor notes

3 Installation Guidelines

Adhered Roofing System using Contact Adhesive



Installation Guidelines using PVC Contact Adhesive – Armourplan SM and P

1. Before use, thoroughly stir the PVC Contact Adhesive. Replace the container lid when work is interrupted.
2. Using a sheepskin or similar roller apply a primer coat of PVC Contact Adhesive to the prepared substrate surface, priming only the area of substrate where the membrane will be laid the same day. Allow adhesive to completely dry. If the substrate is PIR insulation then all the board joints are to be taped using self-adhesive foil faced tape prior to the primer coat being applied.
3. Unroll the Armourplan SM or P over the completely dry primed substrate and fold back approximately half its length.
4. Apply PVC Contact Adhesive with a suitable roller to the exposed surface of the Armourplan SM or P membrane ensuring the weld area is kept free of adhesive. Allow the adhesive to become tacky. In normal conditions only apply approximately 2 linear meters of adhesive. The open time of the adhesive will be effected by varying ambient conditions.
5. With one person either side of the membrane slide the primed membrane onto the previously primed substrate.
6. Continue this process for the remainder of the sheet.
7. Roll the adhered membrane with a water filled roller or soft broom ensuring intimate contact is made between membrane and substrate.
8. Fold back other half of the roll of Armourplan SM or P and repeat the adhering procedure.
9. Roll the adhered membrane with a water filled roller or soft broom ensuring intimate contact is made between membrane and substrate.
10. Position the next roll of Armourplan SM or P, ensuring a minimum overlap of 65mm onto the previously installed roll.
11. Repeat the adhering process.
12. Fully hot air weld using an automatic welder or hot air gun the side lap, allow to cool completely before probing.
13. Mechanically check the integrity of the cooled.

Important: PVC Contact Adhesive must only be applied to 100% dry substrates. Failure to do so could result in the membrane de-bonding from the substrate.

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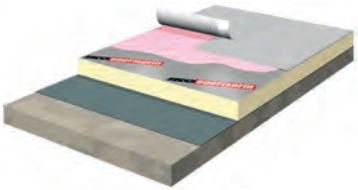
Adhered Roofing System using Sprayfast PCA



Installation Guidelines using Sprayfast PCA – Armourplan SM and P

1. Before use, thoroughly shake the canister.
2. Spray apply a primer coat of Sprayfast PCA to the prepared substrate surface, priming only the area of substrate where the membrane will be laid the same day. Allow adhesive to completely dry.
3. Unroll the Armourplan SM or P over the completely dry primed substrate and fold back approximately half its length.
4. Apply Sprayfast PCA to the exposed surface of the Armourplan SM or P membrane ensuring the weld area is kept free of adhesive. Allow the adhesive to become tacky. In normal conditions only apply approximately 2 linear meters of adhesive. The open time of the adhesive will be effected by varying ambient conditions.
5. With one person either side of the membrane slide the primed membrane onto the previously primed substrate.
6. Continue this process for the remainder of the sheet.
7. Roll the adhered membrane with a water filled roller or soft broom ensuring intimate contact is made between membrane and substrate.
8. Fold back other half of the roll of Armourplan SM or P and repeat the adhering procedure.
9. Roll the adhered membrane with a water filled roller or soft broom ensuring intimate contact is made between membrane and substrate.
10. Position the next roll of Armourplan SM or P, ensuring a minimum overlap of 65mm onto the previously installed roll.
11. Repeat the adhering process.
12. Fully hot air weld using an automatic welder or hot air gun the side lap, allow to cool completely before probing.
13. Mechanically check the integrity of the cooled weld by running a suitable seam probe along the seam applying pressure into the seam.

Important: Sprayfast PCA must only be applied to 100% dry substrates. Failure to do so could result in the membrane de-bonding from the substrate.

NB: This is a guide only – please refer to Armourplan Application Manual for Contractor notes

Adhered Roofing System using Spectrabond Low Foaming Adhesive

Installation Guidelines - Armourplan SG or PSG

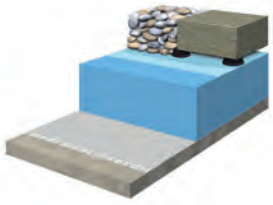
The PU adhesive must be given time to activate prior to applying the membrane. On activation i.e. the point at which the adhesive will afford the highest bond strength, the surface of the adhesive starts to change from pink to opaque.

1. Before use thoroughly stir the Spectrabond PU Adhesive. Replace the container cap when work is interrupted. If required place the Spectrabond PU Adhesive in warm water.
2. Position the Armourplan SG or PSG over the prepared substrate and fold back approximately half its length.
3. Using a suitable roller apply a coat of Spectrabond PU low foaming adhesive to the substrate surface, priming only the area of roof where the membrane will be laid.
4. With one person either side of the membrane slide the membrane into the coated substrate.
5. Fold back the other half of the roll of Armourplan SG or PSG and repeat the procedure.
6. Roll with water filled roller or soft bristled broom ensuring intimate contact is made between membrane and substrate.
7. Position the next roll of Armourplan SG or PSG, ensuring a minimum overlap of 60mm onto the previously installed roll.
8. Repeat the adhering process.
9. Fully hot air weld using an automatic welder or hot air gun the side lap and allow to cool completely before probing.
10. Mechanically check the integrity of the cooled weld by running a suitable seam probe along the seam applying pressure into the seam.

Adhered Roofing System using Sprayfast FMA Adhesive

1. Before use thoroughly shake the Sprayfast FMA canister.
2. Position the Armourplan SG or PSG over the prepared substrate and fold back approximately half its length.
3. Apply a coat of Sprayfast FMA adhesive to the substrate surface, priming only the area of roof where the membrane will be laid.
4. With one person either side of the membrane slide the membrane into the coated substrate.
5. Fold back the other half of the roll of Armourplan SG or PSG and repeat the procedure.
6. Roll with water filled roller or soft bristled broom ensuring intimate contact is made between membrane and substrate.
7. Position the next roll of Armourplan SG or PSG, ensuring a minimum overlap of 65mm onto the previously installed roll.
8. Repeat the adhering process.
9. Fully hot air weld using an automatic welder or hot air gun the side lap and allow to cool completely before probing.
10. Mechanically check the integrity of the cooled weld by running a suitable seam probe along the seam applying pressure into the seam.

Inverted Roofing System

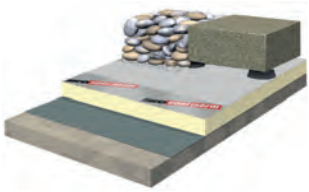


Installation Guidelines using Armourplan SM or P

1. Carefully unroll the IKOtex levelling layer over the previously prepared deck. All end and side laps to be a minimum of 80mm.
2. Carefully unroll the Armourplan SM or P out over the levelling layer.
3. Position the next roll of Armourplan SM or P ensuring the membrane overlaps the previously installed sheet by 80mm.
4. Hot air weld the side laps with an automatic welder or hot air gun and allow to cool completely.
5. Mechanically check the integrity of the cooled weld by running a suitable seam probe along the seam applying pressure into the seam.
6. At upstands and at all roof penetrations secure the Armourplan SM or P membrane with a toothed bar.
7. Cover 10mm gap in the toothed bars with a 50mm x 50mm piece of Armourplan SM or P and weld to the roof sheet.
8. Waterproof the toothed bar with the upstand flashing hot air welded to the roof sheet
9. Thoroughly check the roof area for damage and weak welds paying close attention to all cross-joints and T seams.
10. Carry out a low voltage integrity test. This is a guarantee requirement.
11. Install the approved thermal insulation over the SM or P membrane ensuring that all insulation boards are laid with staggered joints and the boards are clear from debris.
12. Unroll the filter/separation layer over the completed roof area allowing 100mm overlap on all side and end laps.
13. If using round washed pebbles as ballast then the separation layer must be installed to a minimum height of 50mm up all upstand's.
14. Install approved ballast.

NB: This is a guide only – please refer to Armourplan Application Manual for Contractor notes

Warm Ballasted Roofing System



1. Carefully unroll the Armourplan PVC membrane out over the previously installed loose laid VCL and insulation layer.
2. Unroll the next roll of Armourplan PVC ensuring the end laps are staggered and the side overlaps the previously installed sheet by 80mm.
3. Hot air weld the side laps with an automatic welder or hot air gun and allow to cool completely.
4. Mechanically check the integrity of the cooled weld by running a 4mm wide screwdriver (with rounded edges) along the seam applying pressure into the seam.
5. At upstands and at all roof penetrations secure the Armourplan PVC membrane with a toothed bar.
6. Cover 10mm gap in the toothed bars with a 50mm x 50mm piece of Armourplan PVC and weld to the roof sheet.
7. Waterproof the toothed bar with the upstand flashing hot air welded to the roof sheet.
8. Thoroughly check the roof area for damage and weak welds paying close attention to all cross-joints and T seams.
9. Unroll the separation layer over the completed roof area allowing 100mm overlap on all side and end laps.
10. Carry out a low voltage integrity test. This is a guarantee requirement.
11. If using round washed pebbles as ballast then the separation layer must be installed a minimum height of 50mm up all upstand's.
12. Install approved ballast.

NB: This is a guide only – please refer to Armourplan Application Manual for Contractor notes

System Accessories

A range of ancillaries is available to complement the Armourplan PVC field sheet membranes:

- **Armourplan D**
  Homogeneous roofing membrane for use on complex detailing.
- **Armourplan G**
  Glass tissue re-enforced roofing membrane for use on complex detailing.
- **Armourplan Walkway**
  Heavy duty PVC membrane with a grid pattern for use on walkways.

PVC Coated Metal

PVC coated metal is a steel sheet pre-coated with homogeneous PVC membrane. The coated metal can be fabricated off-site to form perimeter details such as drip edges and upstands. The PVC membrane surfacing to the metal enables Armourplan PVC Membranes to be heat welded to preformed edge details to ensure the perimeters are fully sealed and waterproofed.

IKO Sprayfast Adhesives

IKO Sprayfast IBA

IKOpro Sprayfast IBA is a moisture-curing polyurethane adhesive that can be applied faster and more accurately than standard hand-poured PU adhesives. It utilises a new canister system, enabling rapid, professional bonding of a wide range of insulation boards to VCL or straight to deck.

IKO Sprayfast FMA

IKOpro Sprayfast FMA is a moisture-curing polyurethane adhesive that enables fast, secure and professional bonding of fleece-backed polymeric roofing membranes to insulation boards and other substrates. It can be applied up to four times faster than standard roller-applied PU adhesives and is suitable for both large-scale fieldwork and detailing.

IKO Sprayfast PCA

IKOpro Sprayfast PCA is a multipurpose, moisture-curing polyurethane adhesive that enables professional, simple and secure bonding of non-backed PVC roofing membranes to a wide range of roof substrates. It can be applied quickly and accurately and is ideal for use on both large-scale fieldwork and detailing.

System Accessories (continued)

IKOpro High Performance PU Adhesive

IKOpro High Performance PU Adhesive is high performance moisture cured single part, polyurethane adhesive for bonding rigid insulation boards to a wide variety of substrates. The adhesive is cold applied and has been specially developed to allow the safe and rapid bonding of suitable insulation boards.
The product is supplied in 6.5Kg tins ready to apply directly from the container.

Spectrabond Low Foaming PU Adhesive

Spectrabond PU Adhesive is a ready to use, high performance, single component, moisture curing polyurethane adhesive for bonding fleece backed polymeric single ply membranes to rigid insulation and other suitable substrates. The adhesive is cold applied and has been specially developed to allow safe and rapid bonding of suitable membranes.

PVC Contact Adhesive

PVC Contact Adhesive is a ready to use nitrile rubber based, contact adhesive for adhering PVC roofing membranes onto various substrates. It is easy to apply using brush or roller and is specifically used to adhere Armourplan PVC membranes to various substrates at upstands and details.

Preformed Details

A range of preformed corner and outlet units designed to facilitate the installation of Armourplan PVC Single Ply systems. Preformed PVC corner units are available in both internal and external configurations and are flexible and easy to mould and heat weld over the Armourplan PVC Membrane to detail and waterproof corner areas. Preformed Outlets are a range of PVC / Aluminum preformed straight and 90° roof drain outlets. The outlet units are mechanically fixed into position and waterproofed with a cover flashing of Armourplan PVC Membrane which is heat welded onto the outlet flange.

PVC Membrane Lap Preparer

PVC Membrane Lap preparer is a cleaning solvent designed to be used to clean soiled PVC roofing membranes as required prior to welding. It can also be used as a general cleaner to remove wet adhesive and residual dirt from the surface of PVC roofing membranes.

Armourprep Preparation Solution

Armourprep Preparation Solution is a acetone based solvent designed to be used to clean heavily soiled PVC roofing membranes as required prior to welding.

Armourplan PVC Sealant

Specially formulated sealant for PVC membranes. Ideal for sealing detail terminations and available in either white or grey.

System Accessories (continued)

IKO PVC Refurbishment Primer

A polyurethane based product specifically developed to prime existing adhered PVC roof membranes. The primer allows the effective application and adhesion of either Spectrabond Low Foaming PU adhesive or IKOpro High Performance PU adhesive for the installation of an adhered IKO Polymeric roofing system where mechanical fixing of the new roof system cannot be achieved

IKOfix Thermally Broken Tube Washers and Fixing Screws

Polypropylene thermally broken tube washers for fixing membranes and insulation in warm roof build¬ups, used in conjunction with the appropriate fixing screws. Using tube washers reduces thermal bridging and can offer cost savings when fixing through large insulation thicknesses. The tube washer also protects the membrane from damage caused by foot trafficking.

Pressure Plates

Metal pressure plates suitable for membrane and insulation applications. Flat plates are used for rigid / flat surfaces and those with a deeper recess are suitable for compressible substrates.

Toothed Flatbar Peelstops & Termination Bars

Toothed flatbar peelstops and termination bars for mechanical fixing of Armourplan membranes at perimeters.

Armourplan Standing Seam Profile

Armourplan Standing Seam Profile is a preformed profile used to simulate a metal standing seam joint. The profile is manufactured from homogeneous PVC and is heat welded.

Vapour Control Layers (VCLs)

A range of bituminous VCLs are available to complement Armourplan systems. These include metal lined membranes with an impervious aluminium core, and a number of other high performance polyester based options suitable for either torch-on or self-adhesive application.

Spectravap-Polyethylene Vapour Control Layer (VCL)

Spectravap is a 0.3mm thick polyethylene VCL, suitable for use on most Armourplan mechanically fastened systems. It is loose laid over the surface with side and end laps overlapped by a minimum of 80mm and sealed with a Spectravap jointing tape.

PIR Thermal Insulation

Enertherm PIR high performance insulation boards are totally CFC/HCFC free, and are made from rigid polyisocyanurate foam. They are available with a choice of facings - perforated (mineral-coated) glass tissue, or triply gas-tight aluminium.

Spectratex Separation Layers

Spectratex Separation Layers are a range of polyester geotextile isolation and protection fleeces. They are used to protect the Armourplan waterproofing membrane on ballasted roofs and as a separation layer over contaminated or uneven decks.

Rainwater Outlets

IKO Trendy

IKO Trendy vertical roof outlets are made of thermally insulated polyurethane. Available in a range of diameters to enable direct connection to pipes with push in spigot for conventional gravity drainage. The outlet is finished with an Apron of Armourplan Membrane allowing them to be hot air welded to the field sheet.

Armourplan PVC Vertical Outlets

Armourplan PVC rainwater outlets are pre-formed vertical drop outlets manufactured from injection moulded PVC and are available in a wide range of diameters. Armourplan rainwater outlets provide a secure hot air welded solution to roof top drainage when used in conjunction with Armourplan membranes.

Armourplan Refurbishment Rainwater Outlets

Armourplan refurbishment rainwater outlets are pre-formed vertical drop outlets manufactured from injection moulded flexible PVC and are available in a wide range of diameters. The outlet can be pushed into the existing rainwater outlet or downpipe in refurbishment applications where the fins can provide a watertight seal to the inside of the existing outlet. Armourplan rainwater outlets provide a secure hot air welded solution to roof top drainage when used in conjunction with Armourplan membranes.

IKO Easy-Flow Parapet Outlets

IKO Easy-Flow parapet outlets are made from thermally insulated polyurethane. Available in a range of diameters with optional pipe lengths, IKO Easy-Flow outlets enable effective drainage through the parapet wall up to 1m wide into a rainwater hopper. IKO Easy-Flow outlets are available with pre-fitted apron of Armourplan membrane to enable an effective waterproof detail.

Armourplan Horizontal Outlets & Box Scuppers

Armourplan rainwater outlets are pre-formed horizontal parapet outlets manufactured from injection moulded PVC and are available in a range of diameters and rectangular opening sizes. Armourplan rainwater outlets provide a secure hot air welded solution to roof top drainage when used in conjunction with Armourplan membranes.

Hand Welding

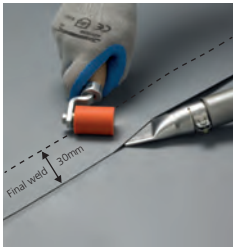
Hand Welding

1. When hot air welding Armourplan the overlap should be clean and dry. The following minimum system overlaps are required. Adhered - 65mm, Loose laid - 80mm Mechanically fixed - 110mm.

TACK WELD *The tack weld prevents movement of the overlap.*

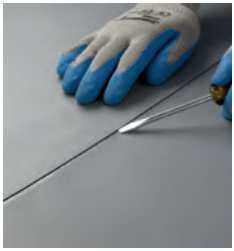
2. Position the welding nozzle at the rear of the overlap allowing for a 30mm lap to remain once welded (see illustration).

PRE-WELD The pre-weld acts as a continuous air trap, ensuring minimal heat loss during the final weld stage.



3. Always roll the pressure roller fully across the seam. A distance of 20mm should be kept between the roller and nozzle.

FINAL WELD The final weld ensures that the overlap is watertight.



4. The seams are to be checked once they have completely cooled. Seams are checked using an approx 5mm wide probe with rounded edges.

SEAM CHECK *A seam check is not a leak test but will help to identify weak welds.*

GENERAL INFORMATION ON WELDING ARMOURPLAN MEMBRANES

Armourplan SM, P and SG can be welded at temperatures ranging from 400°C to 450°C.

The appropriate temperature should be selected depending on individual speed preferences and ambient conditions.

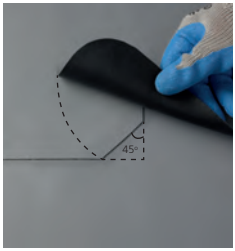
Armourplan D and Armourplan G should be welded at temperatures between 380°C and 420°C. allowing for greater control when dealing with intricate or difficult details.

Automatic machine welding guide rates:

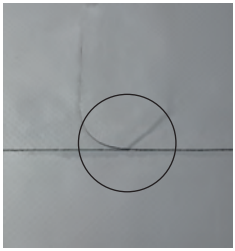
SPEED: 1.8 - 2.0 linear metres per minute
TEMP: 420°C and 450°C

NOTE Welding should be carried out in adequately vented surroundings.

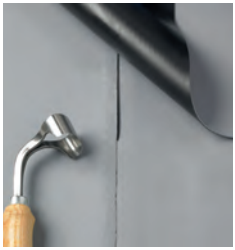
Cross Joints

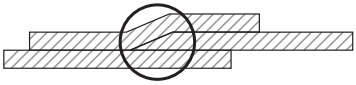


1. Mitre the lower layer of overlap seam as illustrated. Round off corner to top overlap layer. Fully weld subsequent layers of membrane to the field sheet.



NOTE Care should be taken at point of potential capillary (see illustration).





When installing 1.5mm & 2.0mm membranes it is recommended that the seam edge is chamfered in the areas of transverse joints and cross joints. The chamfer must extend the width of the entire weld.

Adhering Upstands

1. The PVC Contact Adhesive is applied evenly with a brush or compatible application roller. Absorbent substrates may require two or more coats of adhesive.

NOTE If in doubt please contact IKO Polymeric Technical Services Department on +44 (0)1257 488012.

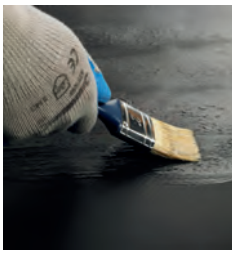
The primed substrate must be allowed to dry fully before further coats or membranes are applied.

NB. Normal conditions require one coat.

Please refer to the Armourplan Application Manual for advice on suitable substrates when using PVC Contact Adhesive.

Insulation boards will require their joints taped.

All substrates must be completely dry before applying Contact Adhesive.



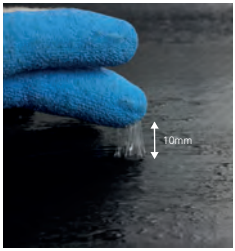
2. PVC Contact Adhesive is now applied to the back of the Armourplan membrane with a brush or compatible application roller.

Residual adhesive should be removed.

Care should be taken not to apply adhesive in areas of seam to be hot air welded.

NOTE If in doubt please contact IKO Polymeric Technical Services Department regarding compatibility between the Contact Adhesive and the substrate/insulation board.

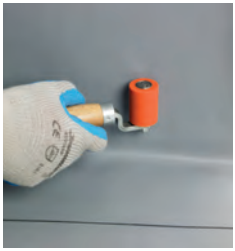
Adhering Upstands (continued)



3. When the solvent has evaporated, position the Armourplan membrane onto the primed substrate.

The evaporation time will depend on the weather conditions, amount of adhesive applied and type of substrate being adhered to.

An indication of when sufficient solvent has evaporated is by the finger test (see diagram). Adhesive strands should be approximately 10mm



4. Once the membrane has been applied to the substrate the surface must be rolled to ensure all air pockets are removed and that intimate contact is achieved between the membrane and substrate.

Armourplan System Construction

1. A 10mm clearance is needed between the bar ends due to expansion and contraction of the bar.

2. Cover the bar ends with a sacrificial piece of Armourplan. This will help protect the membrane flashing from sharp edges.

5 Standard Detail Procedure

Note: either Armourplan D or G can be used for the apron & collar, if using Armourplan G it will be necessary to gently warm and then slightly stretch the edge of the membrane to make it more flexible when dressing through a third plane.

Pipe Flashing

1. Cut a hole in the Armourplan field membrane. This needs to be slightly larger than the pipe diameter.

2a. Cut a hole in the Armourplan D (or G) base plate apron 10mm smaller than the pipe diameter.

NB. The outer diameter should be large enough to cover any additional fasteners.

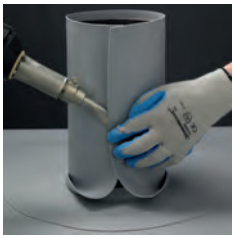
2b. Pull the base plate apron over the top of the pipe.

TIP *Warming up the inner hole with a hot air gun will help this process.*

3a. Once in position the base plate apron will create a 10mm upstand around the pipe.

3b. Hot air weld the outer edge of the base plate apron to the field sheet.

TIP Hot air weld the outer edge of the base plate apron to the field sheet.



4. Cut out a pipe collar flashing to suit the pipe dimensions. A 20mm (min) vertical overlap and 15mm (min) horizontal overlap should be allowed for.

It is advised to prepare the horizontal overlap prior to installation (as illustrated).

Pre-stretch the horizontal overlap.

5. Once prepared, position the pipe collar flashing around the pipe and tack weld the base into position.

Pipe Flashing (continued)

6. Hot air weld the vertical pipe collar seam

7. Hot air weld the horizontal seam to the apron base plate.

8. Completed detail

Once completed, the top of the pipe is to be clamped with a mechanical restraint and sealed using Armourplan PVC sealant.

Rainwater Outlets

1. Mechanically fixed systems require additional fasteners around the outlet. These can be positioned around the completed outlet and weathered separately or alternatively they can be installed under the outlet. (Not suitable for cold roof applications)

2. Connect and seal Armourplan outlet. Weld Armourplan outlet to field sheet.

Optional
Cut and position the circular apron.

3. Weather outlet by welding apron to outlet and membrane.

Parapet Outlets (Option A)

Two matching Armourplan D (or G) pieces should be cut as illustrated. One piece should be welded to the outlet first. Then the second piece can be positioned and welded to the outlet. Once this operation is completed the outer edge can be welded to the field sheet and upstand flashing.

Parapet Outlets (Option B)

Weld the two Armourplan D (or G) pieces to the outlet prior to installing it. Remember to leave the fixing points of the outlet free from weld and complete outer edge welding after the outlet has been installed.

Once secured the Armourplan cloak can be welded to the field sheet and upstand membrane.

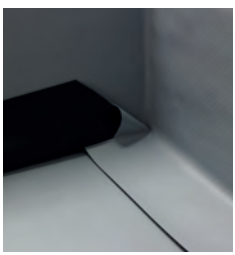
Internal Corner (Horizontal Fold)

1. Adhere Armourplan SM membrane into corner ensuring that the membrane is tight into all angles.

TIP *20mm nozzle advised.*

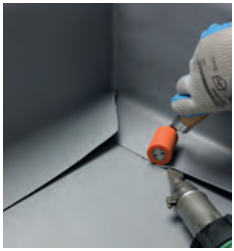
TIP *For corners that are not 90 degrees, allow for an oversized membrane flashing that can then be trimmed. Form internal fold as illustrated.*

2. Form a 45 degree mitre and crease fold with a silicon roller.

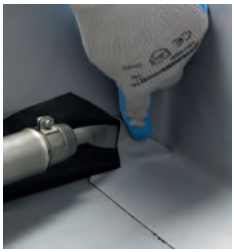


3. Cut out the lower layer of the gusset as indicated.

TIP *Allow gusset to cool during procedure to reduce risk of fold splitting.*

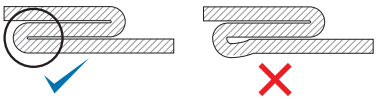


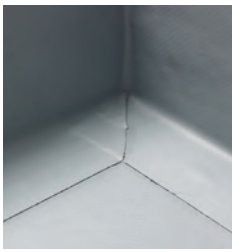
4. Weld lower flap to field sheet.



5. Hot air weld the remainder of the gusset.

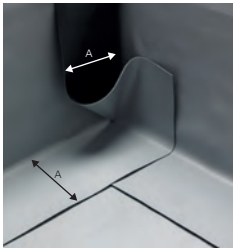
TIP *The critical weld is at the internal fold.*





6. Complete the weld from the corner outwards, to achieve completed corner detail.

Internal Corner (Vertical Fold)



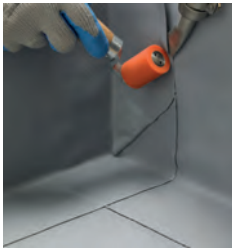
1. Cut and adhere into position the Armourplan SM membrane. Ensure that sufficient material is allowed for on the vertical corner return (see illustration). If the corner is not square, allow for an oversized membrane flashing and trim back. Ensure membrane is tight into all angles.

2. Form a 45 degree mitre and crease fold with a silicone roller. Hot air weld the gusset.

TIP *Allow the gusset to completely cool before moving onto next stage.*

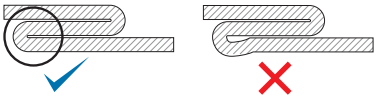
3. Hot air weld the Armourplan SM membrane Pre-formed internal corner flashing overlap to the adjacent flashing and fieldsheet.

TIP *Work away from the internal angle.*



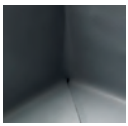
4. Hot air weld the remainder of the gusset.

TIP *The critical weld is at the internal fold.*



5. Once tacked into position, pre-weld then final weld the corner to form completed corner.

Pre-formed internal corner



1. Apply Armourplan SM120 membrane as illustrated

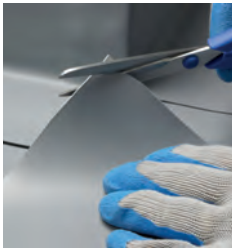
2. Tack pre-formed corner into position ensuring that it fits all internal and external angles correctly. Pre-weld and final weld outer edge of pre-formed corner to membrane flashing.

External Corner

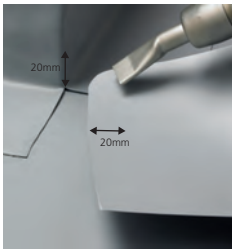
1. Make a cut in the Armourplan SM membrane

2. Warm up the Armourplan SM membrane flashing along the vertical edge and dress the membrane around the corner, avoiding ripples.

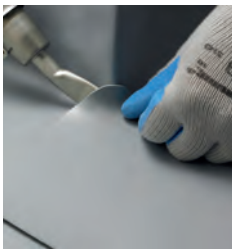
3. Hot air weld the Armourplan SM membrane flashing overlap to the field sheet.



4. Prepare a corner patch from Armourplan D (or G) in line with the vertical corner approx 20mm larger than the required dimensions. Round off the corner before tack welding into position.



5. Warm up rounded corner sufficiently and stretch so that it fits contour of the extended corner. Tack weld the rounded corner into position. Allow for a minimum of 20mm on the vertical surface.



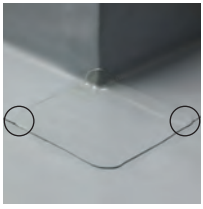
6. Hot air weld the top of the raised section of the corner patch to the upstand flashing. Allow Armourplan membrane to cool fully before proceeding to next stage. Now weld either side of the raised corner to the adjacent angle.

NOTE *Hot air weld Armourplan D/G at approx 380°C -420 °C.*

External Corner (continued)

7. Trim the corner patch in line with outer edge of the upstand flashing.

8. Hot air weld the remainder of the corner detail.

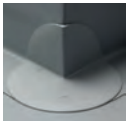


9. Completed detail.

TIP *Care should be taken on the capillaries (see illustration)*

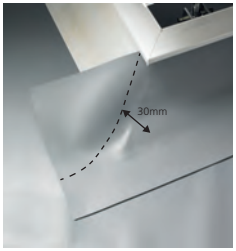
Pre-formed external corner

1. Apply Armourplan SM120 membrane as illustrated

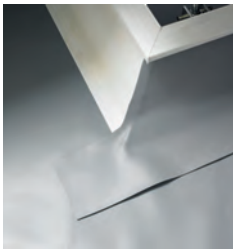


2. Tack pre-formed corner into position as illustrated, ensuring that it fits all internal and external angles correctly. Pre-weld and final weld outer edge of pre-formed corner to membrane flashing.

Rooflights



1. Adhere Armourplan D to the rooflight kerb using Armourplan Contact Adhesive. Ensure that there is sufficient membrane overlap either side of the rooflight (see illustration). Cut out the corner as illustrated. Once trimmed allow for min 30mm extra membrane to return around rooflight corner.



2. Warm up the Armourplan D and adhere to the adjacent surface. Ensure that areas to be hot air welded are free from adhesive.

3. Ensure that there is sufficient membrane either side of the rooflight. Trim excess membrane and allow for a thumb sized tab of material in the base of the corner (as illustrated).

4. The corner is now ready for welding.

TIP *It is advised that all four corners are prepared as outlined previously prior to welding.*

5a. Pre-weld the vertical and horizontal seam starting from the internal angle each time. The protruding thumb tab should be welded first.

5b. The final weld can now be carried out. Start the vertical and horizontal weld from the thumb tab, to achieve the completed detail.

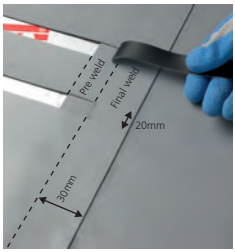
6. Completed detail

Peel Tests

1. Optimum welding quality can be ensured by:

- Test weld prior to actual welding.
- Seam check during welding.
- Seam check after welding.

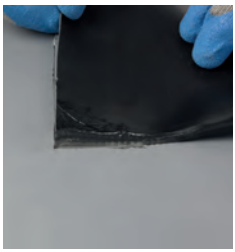
Before welding the membrane a peel test must be carried out to determine the optimum welding parameters for that day. Subsequent test welds should be carried out if outside temperature dramatically changes. Peel tests should be performed for each piece of hot air welding equipment used.



2. Peel test across the seam

The fully cooled welded seam must not separate within the final weld zone. 20mm wide strips are cut across the welded seam and care is to be taken to only cut the top layer.

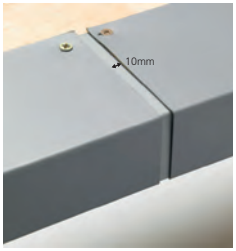
When machine welding the test weld must not separate within the whole width of the weld.



3. Peel test along the seam

The fully cooled welded seam is tested by pulling the top layer of the seam. This will also establish if a continuous weld has been achieved in the final weld zone.

Roof Trims



1. Insert butt strap between joint of Armourplan trims.

Leave a 10mm expansion gap between trims as illustrated.

Trim Fixing Guide

a. General trims on adhered upstand's - fix at 250mm centres.

b. Trims used as mechanical restraint - fix at 150mm centres.

c. Trim used as part of a mechanically fixed upstand - fix at 150mm centres.

d. Fixings should be staggered on wide horizontal surfaces.

2. Apply a 30mm strip of self-adhesive aluminum tape over expansion gap.

This will help to provide a clean line on the pre-weld.

3. An Armourplan D strip should be welded to the face of the trim.

NOTE *Welding temperature for Armourplan D should be approx 380°C ¬400°C.*

Face Fixing Guide

a. 50mm - 90mm deep trims - 0.6mm butt strap plate needed.

b. 90mm - 120mm deep trims - face fixed at each end.

c. 120mm - 150mm deep trims - face fixed at one metre spacings.

Additionally Armourflow metal could be used to form the trims, Armourflow Metal is a heavier grade at 1.2mm for the metal thickness and 1.2mm membrane thickness and in normal circumstances would not require face fixing.

In the event that Face Fixing is not possible:

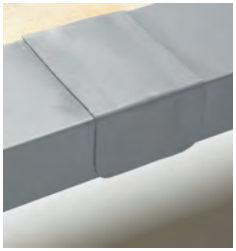
a. If a suitable face fixing cannot be achieved then face fixings can be substituted for additional 0.6mm galvanized butt straps.

b. 50mm - 90mm deep trims - each end and in the centre of the trim.

c. 90mm - 150 deep trims - at 500mm spacings including each end

Trims protected from wind damage by guttering may not need additional face fixing. If in doubt please consult IKO Polymeric Technical Services Department on +44 (0)1257 488012.

Roof Trims (continued)



4a. Carry out the remaining weld of the Armourplan D strap.

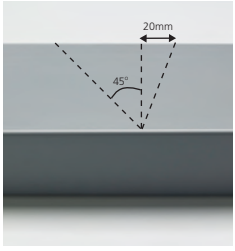
4b. Complete butt strap detail.

5. Hot air weld the Armourplan fieldsheet or upstand flashing directly to the trim.

Ensure membrane is positioned a minimum of 5mm from the outer edge of the trim.

NOTE *Care should be taken to ensure a capillary is not created when passing over the butt strap.*

Armourplan Roof Trims Internal Corner



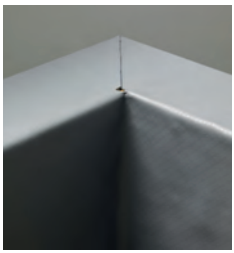
1. Mark mitre on Armourplan coated metal and cut out excess to fit internal corner.

TIP: *Ensure drip return is cut directly below fold point so that a straight corner can be formed.*

To ensure accuracy, transfer cutting point with a right angled straight edge.

2. Internal corner once cut.

3. Fold Armourplan roof trim to form corners and fix to substrate.



4. Cut and adhere Armourplan SM/P membrane to substrate. Ensure membrane is free from adhesive in the section to be welded to Armourplan trim. Once in position weld Armourplan SM/P membrane to the trim and fieldsheet.

TIP: *Before folding the membrane onto the horizontal surface of the parapet, heat up the Armourplan membrane at the point of the fold with the hot air welder.*

This will help to create a clean, neat edge.

5. Cut and position patch as illustrated using Armourplan D membrane only.

6. Hot air weld down the Armourplan D corner patch.

Armourplan Roof Trims External Corner

1. Mark a line on Armourplan coated metal and cut to fit external corner.

TIP: *Ensure drip return is cut directly below fold point so that a straight corner can be formed.*

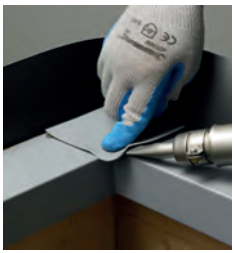
To ensure accuracy, transfer cutting point with a right angled straight edge.

2. Fold the Armourplan roof trim to form external corner and fix to substrate.

Cover the remainder of the corner by inserting a section of Armourplan coated metal as illustrated.

3. Cut and adhere Armourplan SM/P membrane to the substrate.

Ensure membrane is free from adhesive in section to be welded to Armourplan trim.



4. Cut Armourplan D patch and weld into position as illustrated. To ensure coverage, cover cut edge of trim.

5. Weld one side of the Armourplan SM/P membrane to the Armourplan coated metal.

Create a 45 degree fold in the Armourplan SM/P membrane. Hot air weld the pocket together and allow to fully cool before continuing.

6. Hot air weld the remaining side of Armourplan SM/P membrane to the Armourplan trim.

Ensure mitered pocket is fully welded.

Excellence in Polymer Technology

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Membrane Manufacturer

sharecycle
In IKO's book it's better to recycle or redistribute

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