



**PRODUCT AND SPECIFICATION GUIDE
KALIKO ROOFING SYSTEMS PVC-P MEMBRANES
AND THE FLEX-FIX SYSTEM**

A KALTEK system

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OTHER KALTEK SYSTEMS

- Kaligard
- Kalikem
- Kalikuva®

Introduction

This manual is based on 40 years of experience in the installation of The Flex-Fix System, throughout the UK and Europe.

Although every care is taken in the publication of this manual, our Technical Department is constantly reviewing technique in installation and any information or suggestions to improve the manual would be most welcome.

Our Technical Department will be pleased to deal with enquiries for further technical information for a specific situation that is not covered.

This manual is designed to assist:

- The project management team of Architect or Engineer.
- The general contractor.
- The specialist roofing contractor.
- The clerk of works.

Following the principals outlined in the following pages will ensure a long-lived, problem free, installation requiring minimal maintenance.

The Kaliko Roofing Systems Flex-Fix System General Principles

The KRS Flex-Fix System consists of:

- KRS PVC-P roofing membranes, 20 metre x 1.5 metre sheets, are loose laid onto a supporting structure to avoid the stresses caused by thermal and differential movement in the structure and substrate caused by fully bonding.
- The sheets are welded to each other to form a waterproof layer exactly following the shape of the roof. The most complex shapes can be accommodated with ease.
- KRS PVC-P membrane must be attached to the structure at the perimeter of the roof and at all details e.g. gullies and roof-lights.
- KRS PVC-P waterproofing membrane is restrained against wind uplift by Flex-Fix discs and mechanical fixings.
- When insulation is required under KRS PVC-P roofing membranes many types are approved.
- Where no insulation is incorporated in the system, the membrane must be protected from adverse reactions by using cushion layers, separation layers or protective overlay's as required.
- Approved Contractors trained in the required techniques must lay the Flex-Fix System.

The Kaliko Roofing Systems Flex-Fix Roofing System Product Range

KRS PVC-P roofing membranes and Flex-Fix System components are described in this section.

When ancillary products such as insulation, fixings, decks, ballast and so on are used in conjunction with the System, but are not supplied by KALIKO ROOFING SYSTEMS, it is the responsibility of their respective suppliers or manufacturers to ensure their compatibility with PVC-P Roofing membranes.

1. KRS PVC-P Roofing Membranes

These may be divided into three categories:

- a) Unreinforced (D) calendered sheets 1.2mm or 1.5mm thick for executing details, flashings and major expansion joints.
- b) Reinforced (SF) laminated calendered sheet incorporating a polyester mesh to give strength for mechanically fixed system on industrial roofs.
- c) Bitumen and polystyrene resistant (bv) membranes for specialist applications.

Technical Data for these membranes follow later.

All Kaliko Roofing Systems Roofing System PVC-P membranes are manufactured to our specification in Germany in accordance with all relevant DIN standards.
Slip resistant membrane SFNS is available for trafficked areas.

2. Flex-Fix System Components and Ancillary Materials

2.1 Flex-Fix System Components

- a) KRS polyester fleece underlay in various thicknesses.
- b) KRS Glass Fibre Fleece. For use when a fire protective layer is required.
- c) KRS Type 0.45 VB. For use as vapour check.
- d) KRS PVC-P faced metal sheets. For roof edge detailing (sheet size 2m x 1m x 1.40mm or 1.20mm).
- e) KRS PVC-P liquid joint sealant.
- f) KRS unreinforced PVC-P flashing tape in various widths for joints in KRS PVC-P faced metal sheets and flashings.
- g) KRS pre-formed internal and external corners.
- h) Reconstituted rubber protection matting
- i) KRS Solvent Welding Fluid.
- j) KRS C100 Sheet Cleaner.
- k) KRS 180mm diameter Flex-Fix discs.
- l) KRS 50mm diameter galvanised fixing plates.
- m) KRS 44050A Contact adhesive for welding membrane to upstands, curbs etc.
- n) Screws and 50mm galvanised washers or expanding nylon fixings complete with nylon washers.

2.2 Ancillary Materials

- PVC-P Roof Outlets flexible and rigid
- Pre formed corners,
- Pipe and cable flashing
- Bespoke metal profiles,
- Walkway protection sheet
- Rooflights
- Lightning conductor carriers

3. Other materials and equipment

The following equipment is normally required by the contractor to facilitate the installation of the Flex-Fix Roofing System.

3.1 Specialist Items

Hot air welding machines, automatic and hand held
Silicone seam roller
Joint Probes
Sheet Cutter

3.2 General Purpose Tools and Equipment

Brooms and Brushes
Hammer
Shovel
Screw-Drivers
Shears
Electric drill and fixing tool with bits
Knife
Straight Edge
Hand Saw
Tin Snips
Measuring Tape
Extension leads
Chalk Line
Cleaning Materials (rags, cloths, paper etc.)
Pliers
Transformer
De-chipper

4. Site control, handling and storage

The normal control of all site works exercised by the contractors and professional advisors to the owners of the building in question embraces the Flex-Fix system. As bespoke PVC-P metal sections are fashioned into the shape required off site, they must be stored on site in a manner that will avoid damage and distortion. All materials should be stored under cover and in accordance with all the relevant construction site regulations.

Contamination with oil, diesel oil, petrol and other solvents, paint and bituminous products will mar the appearance of PVC-P Roofing Membranes, and in most cases will also reduce their life expectancy.

Care must be taken to prevent damage to the finished System by other trades. If it is impossible to restrict access to completed areas (other than to the roofing contractor), adequate temporary protection should be employed.

Additional Note for CDM Regulations

KALIKO ROOFING SYSTEMS Solvent Welding Fluid, Adhesives, Sheet Cleaner and PVC-P Liquid Joint Sealant are highly flammable liquids having a low flash point. They should be stored in a locked container suitably marked. Smoking, naked flames, sparks etc. are forbidden in their proximity. They should be kept out of strong sunlight as this could cause sealed containers to split. If a solvent welding operation is carried out in an enclosed space, adequate ventilation must be provided. Solvent vapours can cause dizziness or sickness if inhaled; in this event the operator must be taken into the fresh air and encouraged to breathe deeply and appropriate medical advice taken. Additional safety information is contained in COSHH information sheets provided for all hazardous materials used in the installation of the Flex-Fix System.

Accidental spillage of solvent based components should be controlled using dry sand to absorb the liquid and the resulting contaminate disposed of safely under the direction of the site supervisor.

Only Approved Contractors whose employees have received training in the safety requirements and laying techniques employed should undertake installation of the Flex-Fix System.

5. Installation Requirements

All roof finishes should be even and free from sharp edges. Concrete surfaces should be smooth tamped or preferably trowel finish. Timber decks must have all fixings recessed or completely flush with the surface. If any of the timber has been treated with a solvent based chemical a suitable separation layer of glass fibre or polyester fleece with a minimum density of 100g/m² must be used. This also applies in cases of re-roofing where bitumen based materials are to be covered or if a polystyrene insulation is used.

5.1 Roof Drainage

Good practice decrees that a flat roof clears its surface of water as quickly as possible. Although ponding water looks unsightly and increases the dead load on the roof, it will not adversely affect the performance of the Flex-Fix System or the PVC-P waterproofing membrane.

5.2. Trapped Moisture

KRS PVC-P Roofing Membranes are vapour permeable. They are loose laid giving vapour additional free passage beneath the membrane to vent to the atmosphere by way of the edge details, making breather vents superfluous even when covering new or existing roof surfaces which have a high moisture content.

6. Basic Design

KRS PVC-P sheets are loose laid being fixed only at roof edges, upstands, and penetrations. In addition, the sheets are restrained against wind uplift by welding to mechanically fixed Flex-Fix Discs at regular centres.

All joints and laps in the KRS PVC-P Sheets must overlap by 50mm, and wherever ponding is likely sealed using KRS PVC-P Liquid Joint Sealant.

6.1 Layout of Flex-Fix Discs and Insulation Fixings

The fixings holding the Flex-Fix Discs provide additional restraint to any insulation required. The layout and number of fixings relate to the local wind loads and the building height. The Flex-Fix system uses a flexible disc placed between the mechanical fixing and the underside of the waterproofing eliminating penetrations through the sheet. Fixings are evenly distributed throughout the roof area allowing wind loads to be dissipated by the whole of the roof surface acting as a unit.

(The requirements of CP3 Ch V part 2, 1972 and DIN 1055 are always exceeded).

For roofs up to 30m high, in areas of the UK where “average” wind loads are encountered the minimum fixing requirements are:

- General area 600mm centres.
- Local and corner areas 300mm centres.

6.2 Fixings for Various Roof Decks

KRS 50mm Galvanised plates and stainless steel screws are the standard fixing method for the Flex-Fix System. Other fixing methods and combinations are suitable for use with the system such as those designed to prevent cold bridging.

Note

Fixings of different lengths are available to accommodate the combined thickness of roof construction and insulation. The fixing manufacturer should be consulted for pull out tests and suitability.

KRS PVC-P Metal Sections

KRS PVC-P Metal Sections must be used at all internal and external angles, whether the roof membrane is mechanically fixed or ballasted. These must be fixed so that the PVC-P coated face is exposed allowing the waterproofing membrane to be solvent or heat welded to its face.

All fixings used to hold Metal Sections to the structure must be within the weld zone.

Expansion Joints (Metal)

Butt joints of adjoining metal sections should have a 2mm gap between them and be covered with a 38mm wide paper tape. A 125mm KRS Flashing Tape is then welded over the joint.

Joint Strength

There is a limited resistance to peel forces at the welded joint between PVC-P faced Metal Section and the Roofing Membrane, therefore it is essential to ensure that any loads at this point are in shear (i.e. lateral to the direction of the metal at the weld).

Edge sealing

A seal of mastic is recommended under the seating of vulnerable edge details to prevent wind pressurising the loose laid KRS Roofing Membrane.

PRODUCT INFORMATION - KALIKO ROOFING SYSTEMS D

KRS D
PVC-P membrane

Unreinforced
Conforms to DIN 16 730

- Tested in accordance with DIN standards, quality Tested by MFPA
- Resistant to flying sparks and radiating heat in accordance with DIN 4102, part 7
- Building material class B2, DIN 4102, part 1
- Weatherproof
- UV stable
- Resistant to ageing
- Rot-resistant
- Treated with biocide
- Root resistant
- Not compatible with bitumen (NB)

Available types

KRS D

Type	Thicknes s mm	Width mm	Length m	Weight Gsm
D 15	1.5	1450	20	1900

Colours: light grey, dark grey
other colours available on request

Use

- Details and flashings and movement joints.

Kaliko Roofing Systems D15

Technical data

Properties	Check	Unit	Value
Max. tensile force	DIN 53455	N/mm ²	> 15/15
Elongation at max. tensile force	DIN 53455	%	> 300/300
Tear propagation resistance	DIN 53363	N/50mm	> 120/100
Separation force	DIN 53357	N/50mm	≥ 100
High temperature dimensional stability	DIN 53377 6h at 80°C	%	≤ -1.5/+0.5
Condition following storage at high temperature	DIN 53377 6h at 80°C		
Decrease of elongation at break		%	~ 7
Decrease in max. tensile strength		%	~ 8
Behaviour when exposed to salt water, milk of lime and sulphurous acid	DIN 16726		
Decrease in elongation at break		%	~ 5
elongation		%	~ 5
Decrease in max. tensile strength			
Resistance to cold	DIN 53361	°C	> -30
Light-fastness	DIN 53389	grade	8
Weatherproof properties	DIN 53387		No cracks form after 10,000 hours
Water vapour permeability coefficient	DIN 53122 part 1		< 20,000
Root resistance	DIN 4062		Fulfilled
Impact resistance	DIN 16726		No perforation
Weldability			Water-proof
Joint Strength	DIN 16726		Rupture outside the seam joint

Kaliko Roofing Systems SF

KRS SF
PVC-P membrane

Reinforced with polyester
Conforms to DIN 16 734

- Tested in accordance with DIN standards, quality Tested by MFPA
- Resistant to flying sparks and radiating heat in accordance with DIN 4102, part 7
- Building material class B2, DIN 4102, part 1
- Weatherproof
- UV stable
- Resistant to ageing
- Rot-resistant
- Treated with biocide
- Root resistant
- Not compatible with bitumen (NB)

Available types

Kaliko Roofing Systems SF

Type	Thicknes s mm	Width Mm	Length m	Weight Gsm
SF 15	1.2	1500	20	1500
SF 15	1.5	1500	20	1900
SF 18	1.8	1500	20	2300
SF 20	2.0	1500	20	2500
SF 24	2.4	1500	15	3000

Colours: light grey, dark grey, Terracotta, Green
other colours available on request

Use

- Waterproofing membrane mechanically fixed
- Waterproofing membrane ballasted

Kaliko Roofing Systems SF

Technical data

Properties	Check	Unit	Value
Max. tensile strength	DIN 53354	N/50mm	> 1000/1000
Max. breaking elongation	DIN 53354	%	> 15/20
Tear propagation resistance	DIN 53363	N	> 230/230
Separation force	DIN 53357	N/50mm	≥ 100
Alterations in dimensions following storage at warm temperatures	DIN 53377 6h at 80°C	%	≤ -0.5/+0.2
Condition following storage at warm temperatures	DIN 53377 6h at 80°C		
Decrease in max. breaking elongation		%	~ 5
Decrease in max. tensile strength		%	~ 4
Behaviour when exposed to salt water, milk of lime and sulphurous acid	DIN 16726		
Decrease in max. breaking elongation		%	~ 5
Decrease in max. tensile strength		%	~ 5
Resistance to the cold	DIN 53361	°C	> -30
Light-fastness	DIN 53389	grade	8
Weatherproof properties	DIN 53387		No cracks form after 10,000 hours
Steam diffusion resistance coefficient	DIN 53122 part 1		< 15,000
Root strength	DIN 4062		Fulfilled
Mechanical rupture resistance	DIN 16726		No perforation
Weldability			Water-proof
Shear tension resistance of the seam joints	DIN 16726		Rupture outside the seam joint

KRS solvent sealing agent (THF)

Kaliko Roofing Systems solvent sealing agent

KRS solvent sealing agent is used for creating homogenous seam joints on PVC-P waterproofing membranes (for example roofing, plastic wall insulating and flooring sheets, swimming pools etc).

Consumption

Approx. 30 gsm applied with a 4 cm wide brush. KRS solvent sealing agent is applied in undiluted form.

Delivery form

5 litre disposable drum (approx. 4.5 kg)

Storage

Store in air-tight containers. Once opened, drums can only be stored for a limited period of time.

Instructions for use

- Only use KRS solvent sealing agent for seam and lap-welding.
- Surfaces being joined together must be clean and dry and clear of any grease and dust. You are advised to use Kaliko Roofing Systems C100 cleaner.
- Ensure that you apply KRS solvent welding agent evenly between the overlap using either the applicator or brush.
- The seam created also needs to be weighed down, usually with a sand tube, which is drawn along the seam as the welding work proceeds.
- The weld seam is tested with a test probe once sufficient time has been allowed for the solvent to cure. If there are any flaws in the seam, they are to be re-done with hot air.
- Solvent welding should not be attempted at ambient temperatures below 5°C.

KRS solvent sealing agent is a highly volatile, stabilised solvent. When using the product, pay careful attention to the relevant safety regulations for working with solvents and flammable liquids. For further details, please refer to safety data sheet for KRS solvent sealing agent (THF) – copies available on request.

Kaliko Roofing Systems PVC-P seam sealant

KRS PVC-P seam sealant

KRS PVC-P seam sealant is a liquid film. It is colour co-ordinated to match the PVC-P membranes, which are joined by solvent or hot air welding.

Areas of use

KRS PVC-P seam sealant is used for sealing the seams on welded PVC-P membrane.

Consumption

Approx. 10 gm per lineal metre of seam

Delivery form

- 1 litre disposable drum or dispenser
- 5 litre disposable drum (approx. 5.0 kg)
- 10 litre disposable drum (approx. 9.9 kg)
- 30 litre disposable drum (approx. 29.7 kg)

Storage

Store the product in its original drum in a cool, dry place. Ensure that the drum is sealed tightly. Follow the instructions on the drum (the product contains solvent).

Instructions for use

The edge of the seam to be sealed with KRS PVC-P seam sealant must be dry and clean. The seam sealant is applied using a PE bottle with a metering nozzle. Coagulated seam sealant can be returned to its usable state by adding solvent.

Before use, stir the KRS PVC-P seam sealant well in the drum in order to achieve a shade which matches that of the membrane. When using the product, pay careful attention to the relevant safety regulations for working with solvents and flammable liquids. For further details, please refer to safety data sheet for KRS PVC-P seam sealant.

Kaliko Roofing Systems cleaner (C100)

KRS cleaner

KRS cleaner is a highly flammable, highly volatile. It is used for cleaning seam surfaces before they are joined or sealed. It is also used for cleaning grease from metal or plastic surfaces in preparation for adhesive or solvent sealed joints.

Consumption

35-50 g/m of seam, depending on how dirty the seam is.

Delivery form

5 litre disposable drum (approx. 4.2 kg)

Storage

Store the product in its original drum in a cool dry place. Ensure that the drum is sealed tightly. Follow the instructions on the drum (the product contains solvent).

Instructions for use

KRS cleaner has a strong paint and dirt-dissolving effect. Do not leave it on the product for too long or use in excessive amounts. Use neutral coloured cloths to avoid colour transfer. Avoid contact with and skin! For further details, please refer to safety data sheet for KRS cleaner (C100).

Kaliko Roofing Systems FB bonded plate

KRS FB bonded plate

KRS FB bonded plate comprises a steel plate which is hot-dip galvanised on both sides (zinc deposit 275 gsm, type ST2 02 Z), 0.6 mm thick with PVC-P membrane conforming to DIN 16 730 bonded to its face side.

Colour : light grey, dark grey other colours available on request

Backing (galvanised sheet steel): protective lacquer coating.

Properties

- Permanent bond between the sheet steel and the PVC-P membrane face.
- Welding strength test in the form of a double cross test conforming to DIN 53 156.

Areas of use

KRS FB bonded plate is suitable for manufacturing bespoke termination profiles and for fixing and anchoring membranes in difficult detail applications.

Delivery form

KRS FB bonded plate

Type	Bonded plate thickness: mm	Metal plate thickness: mm	Coat thickness: mm
FB 12	1.2	0.6	0.6
FB 14	1.4	0.6	0.8

Sheet Size 2000 x 1000 mm

30 or 50 per pallet

Bespoke profiles available on request

Storage

Store KRS bonded metal plates lying flat in dry surroundings.

Instructions for use

Profiles can be made from KRS FB bonded plates using conventional metal-work tools. Cutting tools must be kept clean and sharpened. Blunt blades will cause damage to the facing as a result of squeezing or ripping. It is best to guide the cut along the back of the bonded plate. During edge trimming, the bending radius should not be any more than two or three times the thickness of the bonded plate.

KRS membranes are attached to KRS FB bonded plate by solvent or hot air welding.

Specification 1.

- **Overlay failed waterproofing.**
- **No insulation required.**
 - Remove chipping to expose existing waterproofing.
 - Cut out all blisters on failed bituminous system leaving exposed deck open to provide venting to any moisture trapped beneath the retained felt or mastic.
 - Loose lay 200gm polyester fleece with 100mm overlap at edges and laps.
 - Install Colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 150mm centres.
 - Install Flex-Fix discs, fixing through to sound deck, at maximum 600mm centres in general area and at maximum 300mm centres in local area to comply with local wind uplift requirements, with 50mm headed fixings or 50mm Galvanised Washer/Screw combinations to achieve a minimum pull out resistance of 0.4kn
 - Lay SF12 reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix discs only - Note: 50mm fixing heads or washers must be free of adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method"
 - Install **D15** unreinforced flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane, allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method" Apply KRS liquid PVC-P bead to all tested laps and joints.

Specification 2

- **Overlay failed waterproofing**
- **Upgrade insulation.**
 - Remove chippings to expose existing waterproofing
 - Cut out all blisters on failed bituminous system leaving exposed deck open to provide venting to any moisture trapped beneath the retained felt or mastic.
 - Lay suitable insulation fixed to manufacturer's instructions.
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 150mm centres.
 - Install Flex-Fix discs at maximum 600mm centres in general area and at maximum 300mm centres in local area to comply with local wind uplift requirements fixing through insulation to sound deck with 50mm head fixings to achieve a minimum pull out resistance of 0.4kn.
 - Lay **SF12** reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix Discs only - Note: 50mm fixing heads or washers must be free of adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method".
 - Install **D15** unreinforced flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane, allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe" method. Apply KRS liquid PVC-P bead to all tested laps and joints.

Specification 3.

- **New construction - metal/timber deck.**
- **Compatible insulation**
 - Loose lay 1000 gauge polythene or similar vapour control layer over metal deck.
 - Lay compatible insulation fixed to manufacturers instructions - polyurethane, polyisocyanurate, phenolic rigid foam boards, Rockwool, dense fibre or foam glass are compatible insulants
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 300mm centres.
 - Install Flex-Fix Discs at maximum 600mm centres in general area at maximum 300mm centres in local area to comply with local wind uplift requirements fixing through insulation to sound deck with 50mm head fixings to achieve a minimum pull out resistance of 0.4kn.
 - Lay **SF12** reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix Discs only - Note: 50mm fixing heads or washers must be free from adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method."
 - Install **D15** unreinforced PVC-P flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane, allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method". Apply liquid PVC-P bead to all tested laps and joints.

Specification 4.

- **New construction - metal/timber deck.**
- **Non compatible insulation**
 - Loose lay 1000 gauge polythene or similar vapour control layer over metal deck.
 - Lay insulation fixed to manufacturer's instructions.
 - Loose lay 200 gm/sq.m. Polyester or raw glass fleece over polystyrene insulation ready to be fixed by Flex-Fix System discs later.
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at maximum 300mm centres.
 - Install Flex-Fix Discs at maximum 600mm centres in general area at maximum 300mm centres in local area to comply with local wind uplift requirements fixing through insulation to sound deck with 50mm head fixings to achieve a minimum pull out resistance of 0.4kn.
 - Lay **SF12** reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix Discs only - Note: 50mm fixing heads or washers must be free from adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method."
 - Install **D15** unreinforced long life PVC-P flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane, allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method". Apply liquid PVC-P bead to all tested laps and joints.

Specification 5.

- **New construction.- Wood wool deck.**
 - Loose lay vapour control layer over wood wool deck.
 - Lay suitable insulation fixed to manufacturer's instructions.
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 150mm centres.
 - Install Flex-Fix Discs at maximum 600mm centres in general area at maximum 300mm centres in local area to comply with local wind uplift requirements fixing through insulation to sound deck with 50mm head fixings to achieve a minimum pull out resistance of 0.4kn - **Note: If pull out resistance is not achieved within the wood wool slab fixings should be installed through to joists or into channel reinforcing. The Flex-Fix Systems is designed around a 600mm(2ft.) module to allow for this eventuality.**
 - Lay **SF12** reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix discs only - Note: 50mm fixing head or washers must be free of adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method".
 - Install **D15** unreinforced flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method". Apply liquid PVC-P bead to all tested laps and joints.

Specification 6.

- **New construction - concrete deck - warm roof.**
 - Loose lay vapour control layer over concrete deck.
 - Lay suitable insulation fixed to manufacturer's instructions.
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 150mm centres.
 - Install Flex-Fix Discs at maximum 600mm centres in general area at maximum 300mm centres in local area to comply with local wind uplift requirements fixing through insulation to sound deck with 50mm head fixings to achieve a minimum pull out resistance of 0.4kn.
 - Lay **SF12** reinforced PVC-P waterproofing membrane over prepared area ensuring good adhesion to Flex-Fix Discs only - Note: 50mm fixing heads or washers must be free of adhesive.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method".
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the sharp probe method.
 - Install D15 unreinforced flashing membrane cut to suit upstands and penetrations. Heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method". Install liquid PVC-P bead to all tested laps and joints.

Specification 7.

- **New construction - concrete deck- Inverted roof.**
 - Loose lay 200gm fleece cushion layer over concrete deck.
 - Install colour matched PVC-P faced metal profiles as required at perimeters, upstands and penetrations fixed at 150mm centres.
 - Loose lay **SF12** reinforced PVC-P waterproofing membrane over 200gm fleece cushion layer.
 - Heat weld all 50mm laps and joints and test by the "sharp probe method"
 - Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld to PVC-P faced metal profiles at all perimeters, upstands and penetrations and test by the "sharp probe method".
 - Install D15 unreinforced flashing membrane cut to suit upstands and penetrations, heat weld to PVC-P faced metal profiles. Wherever flashing membranes dress over roof membrane, allow a minimum of 50mm overlap and heat weld flashing to roof membrane.
 - Test all welds by the "sharp probe method". Apply liquid PVC-P bead to all tested laps and joints.
 - Loose lay 200gm fleece layer over finished **SF12** membrane.
 - Loose lay suitable insulation to achieve required u value.
 - Cover roof area with suitable river washed ballast, paving slabs or roof garden components to provide a minimum 50kg ballast per m2

Specification 8.

- **Fully adhered Kaltek adhesive**

Note: This specification is for use over sound bituminous or mastic surfaces only. The adhesion made by KRS Roofing Systems Kaltek PVC-P/bitumen activator is sufficiently strong to exceed all requirements of DIN 1055 and CP 3. However, it should be noted that the bond is only made to the top surface of the existing waterproofing system and no guarantee can be given for the performance of the bond between the original deck and the existing bituminous waterproofing.

- Ensure existing bituminous layer is clean and smooth ready to receive Kaltek activator.
- Install colour matched PVC-P faced metal profiles if required to terminations and perimeters fixed at 250mm centres through to sound deck.
- Stir Kaltek activator thoroughly and apply to the existing bituminous surface only, using a rubber squeegee, in an even coat at the rate of 0.5 - 1 kg Kaltek to 1 sq.m. depending on surface condition.
- After approx. 10 to 15 minutes roll **SFbv15** bitumen compatible long-life reinforced PVC-P membrane into the activated bituminous surface pressing firmly to ensure full surface contact, actual times will vary depending on atmospheric conditions.
- Partial adhesion is achieved on contact. Full adhesion is achieved after 12 - 14 hours.
- Ensure that activated bitumen cannot come into contact with any area of the new **SFbv15** waterproofing membrane that must be welded i.e.: metal profiles or lap and joint areas.
- Weld minimum 50mm laps and joints by approved method and test by the sharp probe method.
- Install liquid PVC-P seal to all tested laps and joints.
- The finished roof area may show initial surface blistering this will disappear as excess solvent is released through the membrane.

Specification 9.

- **Fully adhered SF12bvSK Self Adhesive Membrane**

Note: This specification is for use over dry, sound, smooth and dust free materials and structural decks.

- Ensure deck or substrate is clean, dry and dust free ready to receive primer.
- Prime surface with good quality quick drying bituminous primer following manufacturer's instructions.
- Install colour matched PVC-P faced metal profiles as required to perimeters and terminations fixed at max. 300mm centres through to sound deck.
- Carefully position **SF12bvSK** self-adhesive reinforced PVC-P membrane ensuring that bitumen cement will not contaminate metal profiles at perimeter terminations.
- Roll out **SF12bvSK** membrane gently removing the release foil at an oblique angle from the rear of the membrane. Steady pressure applied to the membrane as the bitumen cement comes into contact with the prepared surface will ensure good overall primary adhesion.
- Roll over the adhered surface with a hard rubber roller to complete the bond between membrane and prepared substrate or deck.
- **SF12bvSK** should be butt jointed at the end of each roll and at perimeter metal profiles. The 50mm selvage should only be used to weld **SF12bvSK** to itself. At internal perimeter angles or changes of level within the roof area **SF12bvSK** should be mechanically fixed using either elongated plates at maximum 300mm centres, galvanised termination bar or welded to PVC-P faced metal profiles.
- Butt joints and perimeter metal profiles should be covered using 135mm wide **bv15** cover strips welded to the surface to provide a minimum 50mm lap to each side of the joint.
- All welded joints should be tested by the sharp probe method and have a liquid PVC-P seal applied after approval.

Note: The vapour permeability of **SF12bvSK** is not compromised by the inclusion of the self-adhesive bituminous cement.

Specification 9.

- **Bitumen to PVC-P joints and day joints.**

Ensure a 100mm wide strip of existing bituminous layer is clean, dry and smooth, ready to receive bitumen primer.

Prime surface following manufacturers instructions.

Install **SF12bvSK** reinforced PVC-P jointing strip pressing firmly onto prepared area, gently removing release film at an oblique angle as the jointing strip is extended.

Primary adhesion is achieved on contact.

Complete the installation by firmly rolling the whole area with a hard rubber roller.

(a) Day joints:

Trim **SF12** reinforced PVC-P membrane to provide neat edges and heat weld a standard 50mm seam to prepared **SF12bvSK** reinforced PVC-P/bitumen joint strip and test by the sharp probe method.

(b) Permanent and semi permanent joints:

Install suitable mechanical fixings at max. 300mm centres throughout the length of the **SF12bvSK** jointing strip ensuring that fixings are a minimum of 50mm from the exposed bituminous waterproofing to remain.

Trim **SF12** reinforced PVC-P membrane to provide neat edges and weld a minimum 50mm seam to the prepared **SF12bvSK** PVC-P/bitumen jointing strip ensuring that the mechanical fixings are covered by a minimum of 25mm of new **SF12** membrane adjacent to the exposed bituminous waterproofing.

- Install liquid PVC-P bead to all tested laps and joints.
- Note: All standard PVC-P membranes must be protected from contact with bitumen using a suitable fleece.

Other mechanical fixing systems

KRS advanced PVC-P membranes are suitable for use with any mechanical fixing system commonly in use throughout the world.

The KALIKO ROOFING SYSTEMS insurance backed warranty remains valid with all propriety systems so long as they are fixed in accordance with the system designer's instructions.

Typical systems are:

- Elongated plates or washers
- Seam fixing
- Frame fixing
- Rigid plastic or PVC-P faced metal disc fixings either above or below the membrane
- Bar fixing - non rusting or galvanised pre formed bar

Fixings:

Only those fixings recognised by and in regular use by propriety system designers within the single ply roofing industry should be used, consult the individual system designer for recommendations.

Maintenance requirements

For all roofs waterproofed with Kaliko Roofing Systems PVC-P membranes.

- KRS PVC-P roofing membranes are effectively maintenance free however it is good practice to ensure that roof outlets are cleared of leaves at least once a year.

Instructions for permanent repairs:

- Clean area around the damage, with **C100** sheet cleaner ensuring that an area 50mm greater than the damaged area is cleaned ready to receive new membrane.
- Heat weld appropriate **SF12** Reinforced PVC-P membrane to the cleaned sheet and test by the sharp probe method.
- Seal tested weld with liquid PVC-P sealant
- In an emergency a temporary patch can be applied using a good quality contact adhesive, following the general principles described above, carefully following the adhesive manufacturers instructions.
- To maintain the insurance backed warranty a permanent repair, cutting out the temporary patch, must be carried out by a KALIKO ROOFING SYSTEMS Authorised Contractor.

Sundries:

Outlets

KRS advanced PVC-P membranes are suitable for use with clamp ring roof outlets. The clamp ring on these outlets provides the primary seal and must be smooth, flat and of good design.

When welding PVC-P membranes to PVC-P roof outlets manufactured by others consideration should be given to the depth of any surface markings or patterns which may defeat either the effectiveness of the weld or the flow of surface water.

For refurbishment of existing outlets KRS approved rigid or flexible PVC-P outlets are available

Pipe flashings and upstand flashings

D15 unreinforced PVC-P membrane is used to form bespoke flashings for all penetrations not catered for in the standard range.

KRS Roofing Systems colour matched metal profiles

Standard profiles are supplied in 2m lengths with 50mm profile surfaces.

Bespoke metal profiles are manufactured to suit angles other than 90 degrees and profile surfaces exceeding 50mm.

PVC-P faced metal is available in 2m x 1m sheet form for cutting and bending by others.

Corners

Pre-formed **D15** internal and external corners are available.

Walkways

KRS advanced PVC-P membranes are suitable for maintenance and general foot traffic and in normal circumstances do not require additional protection.

Where walkways are to be identified the use of **SFNS12** slip resistant reinforced PVC-P membrane, in a contrasting colour, welded over the completed waterproofing installation is recommended.

Where additional protection is considered necessary, particularly in areas where plant is dismantled for maintenance at roof level and sharp tools are likely to be used, a reconstituted rubber protection mat should be used over the completed waterproofing installation.

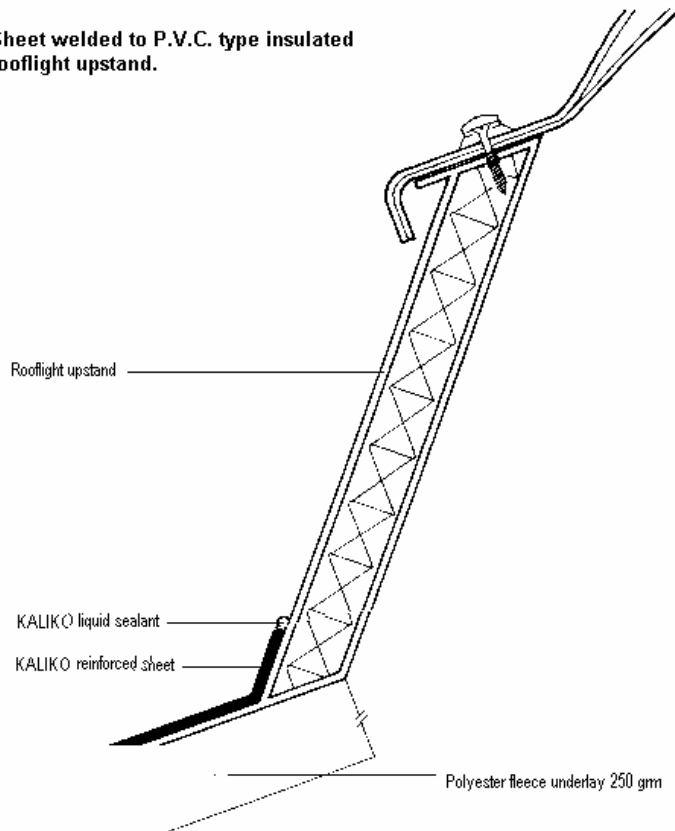
Min 6mm thick, spot bonded, ladder bonded or fully adhered with **4050a** adhesive.

Rooflights

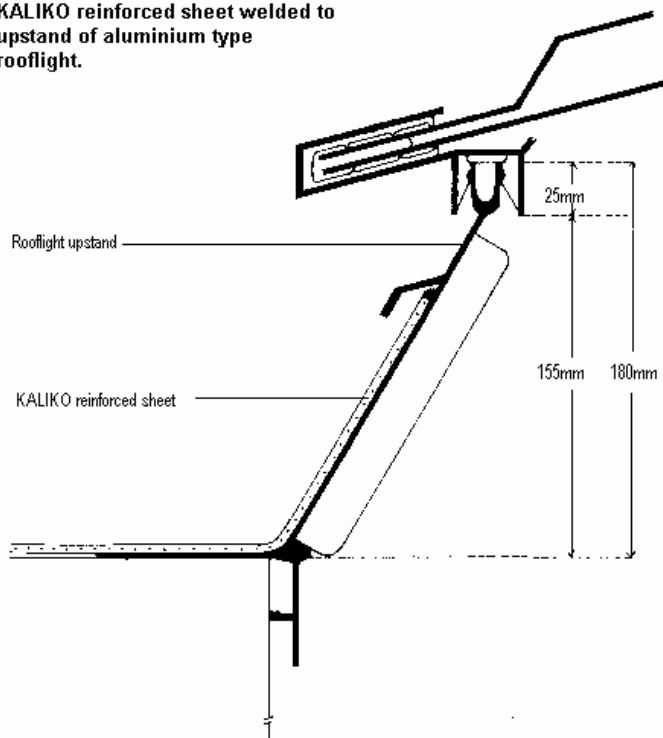
Acrylic and Polycarbonate glazed Rooflights with compatible insulated kerbs are available in a range of sizes and designs.

General Detail Drawings

Sheet welded to P.V.C. type insulated
rooflight upstand.



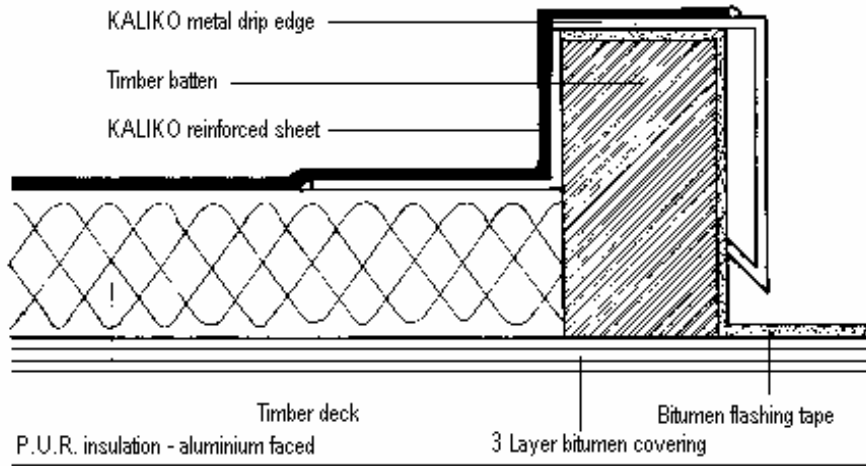
KALIKO reinforced sheet welded to
upstand of aluminium type
rooflight.



Abutment of flat roof finishing at join between new roof and old bitumen roof.

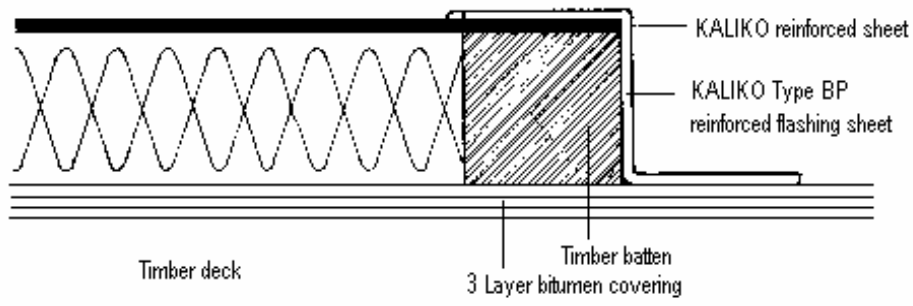
Finish being parallel to fall of roof.

Constituents: timber deck, 3 layer bitumen covering, insulation, wooden end block, internal angle, KALI KO sheet, bitumen flashing tape, standard drip edge.



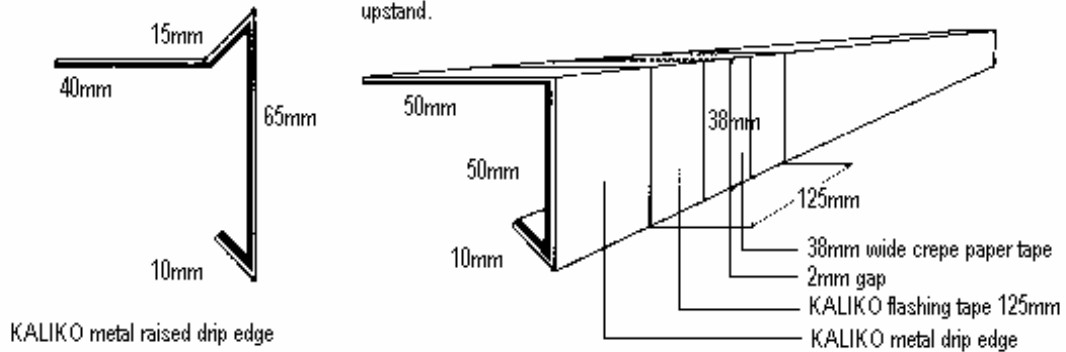
Finish being against fall of roof.

Constituents: timber deck, 3 layer bitumen covering, insulation, wooden end block, KALI KO sheet, flashing of type BP (Bitumen proof) bonded to bitumen.



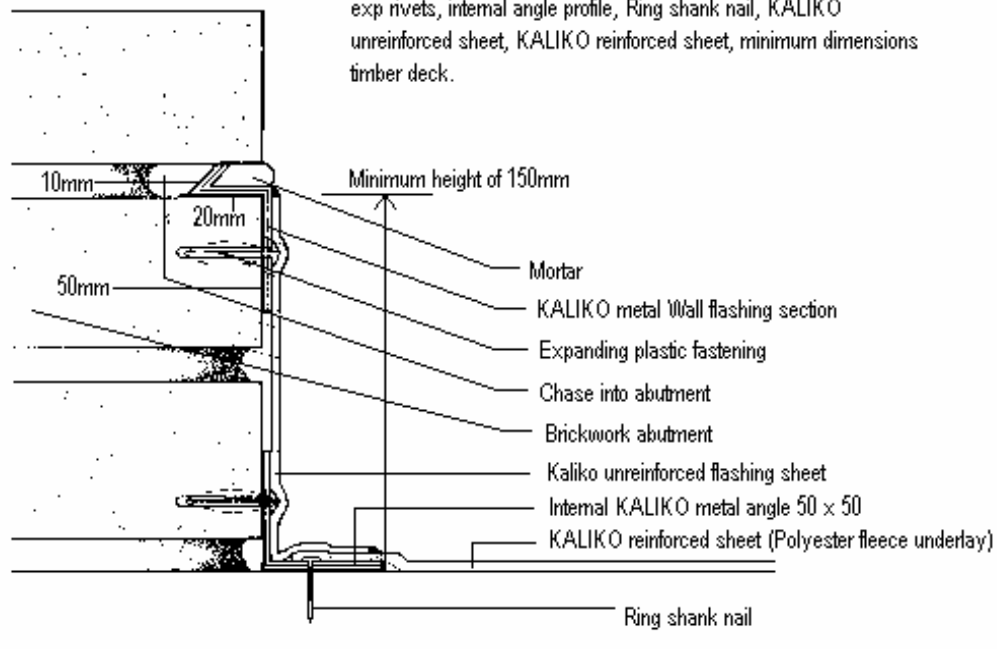
Edge trim detail showing join.

Constituents: Standard drip edge, 2mm gap, 38mm wide paper tape, 125mm wide KALIKO flashing tape, cross section of alternative edge trim: verge upstand.

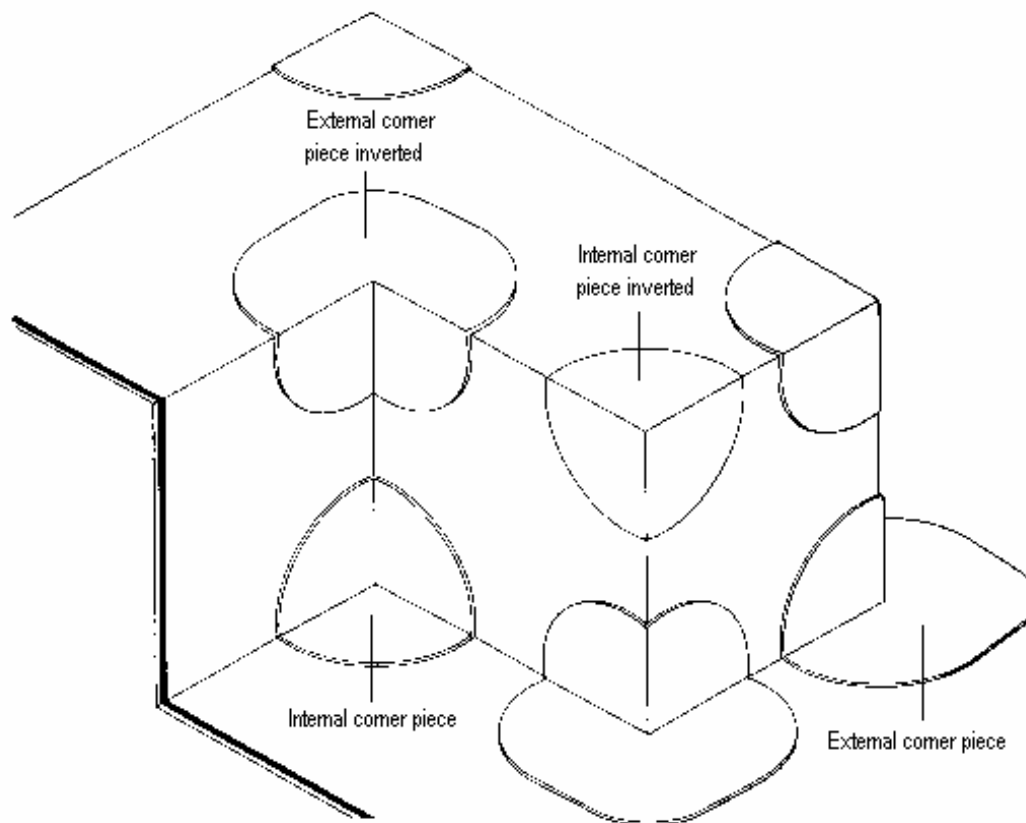


Wall abutment detail.

Constituents: Bricks, mortar and chase, wall abutment profile, Nylon exp rivets, internal angle profile, Ring shank nail, KALIKO unreinforced sheet, KALIKO reinforced sheet, minimum dimensions timber deck.

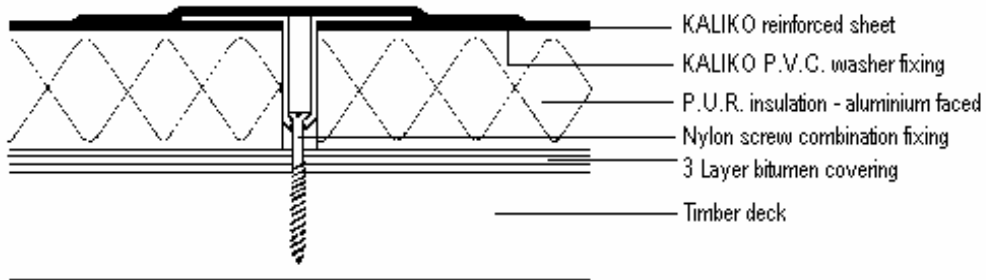


Use of KALIKO pre-formed corners.



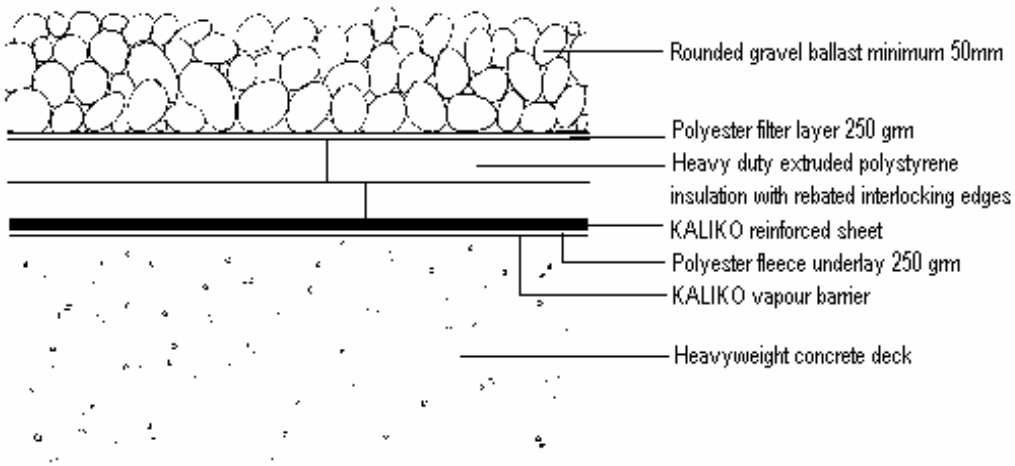
Re-roof over existing bituminous roof.

Constituents: timber deck, 3 layer bitumen covering, insulation, KALIKO P.V.C. washer, Hardscrew combination fixing, KALIKO reinforced sheet.



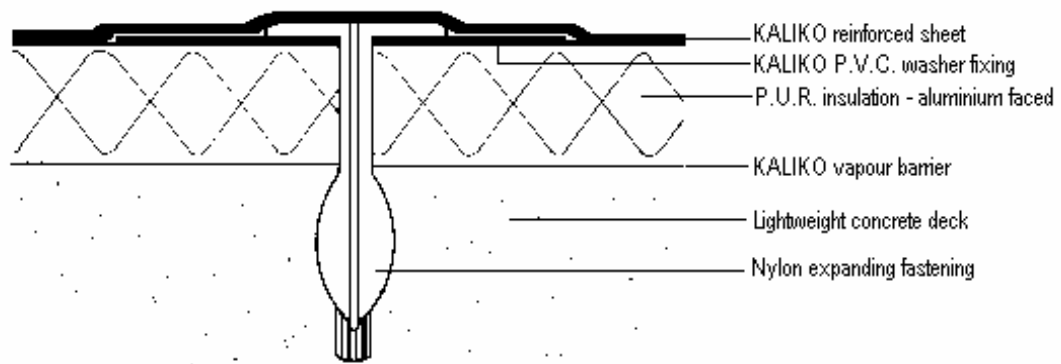
Roof over heavyweight concrete.

Constituents: heavy concrete deck, fleece underlay, KALIKO reinforced sheet, heavy duty insulation boards with interlocking rebated edges, 250 gm polyester filter layer.



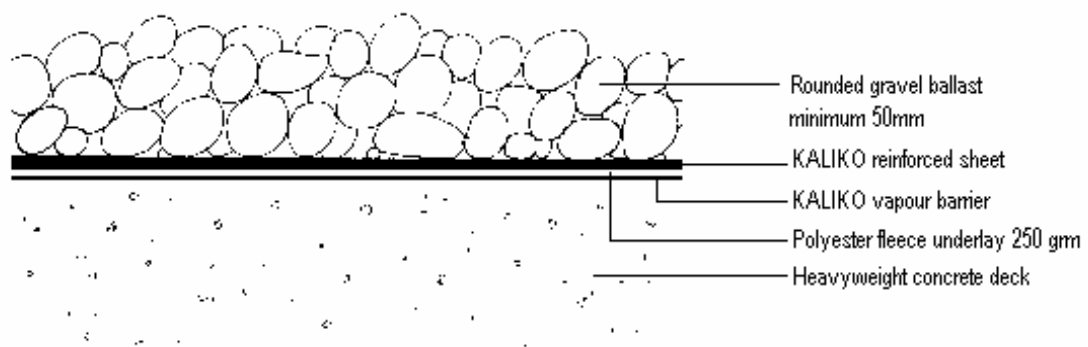
New roof on lightweight concrete deck.

Constituents: lightweight concrete deck, insulation boards, KALI KO P.V.C. washer, nylon expanding fixing with stainless steel centre pin.



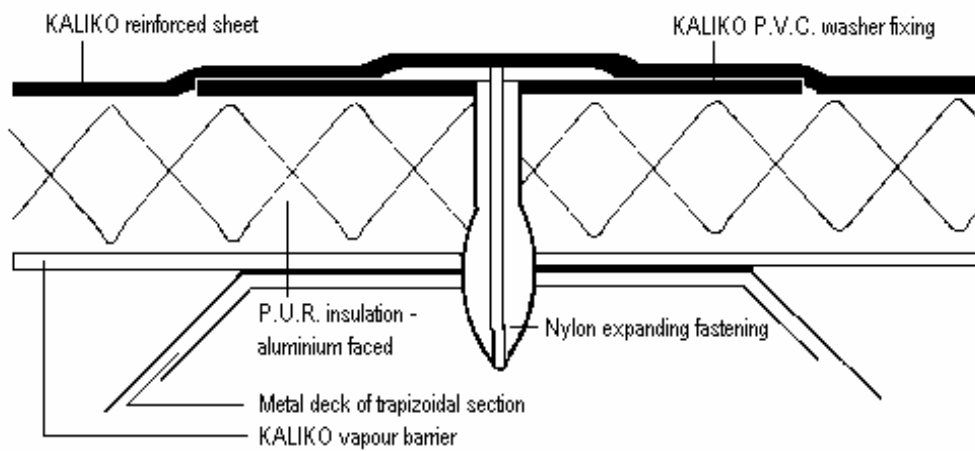
New roof on heavyweight concrete deck.

Constituents: Heavyweight concrete deck, fleece underlay, KALI KO reinforced sheet, gravel ballasting.



New roof on metal deck.

Constituents: trapezoidal section metal decking, KALIKO vapour barrier, insulation boards, KALIKO P.V.C. washer fixing, nylon expanding fixing, KALIKO reinforced sheet.



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Other Kaltek Systems:

Kaliko Multiplan

PVC-P membrane used with any single ply roofing mechanical fixing system currently in service
– Seam fixing, frame fixing bar fixing etc.

Kaligard

Bridge deck waterproofing system designed for the protection of Rail Bridges for Railtrack PLC
Resistant to diesel fuel, fuel oil and bitumen.

Kaliko Liner

Chemical resistant liners for swimming pools, fuel bunds, containment tanks, pools and ponds

Kalikuva®

Passive protection system designed for the Home Office for use in secure institutions suitable
for padding almost any hard surface



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