IKO PERMATEC

SYSTEM INSTALLATION GUIDELINES

MADE IN THE U.K. SINCE 1883

IKOGROUP.CO.UK

ABOUT THIS GUIDE

These system installation guidelines are intended as a guide for Site Operatives, Supervisors and Managers to ensure the correct storage, handling, installation and protection of IKO Permatec hot melt monolithic waterproofing systems.

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WE ARE IKO

Recognised as being an industry institution in the UK

With more than 140 years' manufacturing experience, IKO is firmly established as the UK's market leader in roofing, waterproofing and insulation solutions, along with our fast-growing highways maintenance range. This hard-earned reputation has been built on a foundation of high quality products, exemplary customer service and an unwavering commitment to driving positive change and protecting what matters to our people and the planet.

With this comes a responsibility to continue investing in our product solutions, manufacturing facilities and extensive team of experts to deliver excellence at every level.

IKO PERMATEC HOT MELT MONOLITHIC WATERPROOFING SYSTEMS

IKO Permatec hot melt monolithic waterproofing systems comprise IKO Permatec, IKO Permatec LI, IKO Permatec Anti-Root, IKO Permatec LI Anti-Root hot melt waterproofing compounds. These compounds contain specially-formulated combinations of refined bitumen, synthetic rubbers, fillers and other additives that are hot-applied in conjunction with carefully-selected reinforcement/detailing fabrics and protection layers to achieve ultimate waterproofing performance.

Installed by a nationwide network of IKO-registered Permatec installers, IKO Permatec provides a tough, flexible, waterproof membrane for flat roofs, certified for use on zero fall flat roofs, podiums, green roofs and blue roofs.

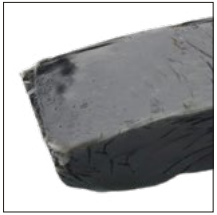
NB: IKO Permatec Anti-Root and LI Anti-Root are suitable for all green roof, biodiverse roof and roof garden systems.

Features and benefits

- Hot-applied system
- BBA-certified No. 03/4009, including zero fall decks
- Outstanding durability - remains waterproof for the design service life of the roof
- Nominal membrane thickness of 6mm
- Tough and resistant to impact damage
- Excellent low temperature flexibility
- Applied directly to substrate
- Homogeneous
- Seamless application and rapid setting
- Resistant to rain, snow and frost immediately after application
- Integral root protection - no need for separate anti-root barriers (IKO Permatec Anti-Root and LI Anti-Root)
- IKO Permatec LI delivers a reduction of over 50% embodied carbon compared to our standard IKO Permatec system
- Virtually no packaging to have to dispose of (zero wrapper waste)

IKO PERMATEC SYSTEM COMPOUNDS

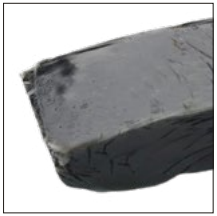
IKO Permatec



A specially-formulated combination of bitumen, synthetic rubbers, fillers and other additives. It is hot-applied to the prepared substrate using squeegees to a total nominal thickness of 6mm.

Size	12kg in polypropylene wrapper
Product code	24110080

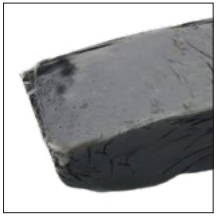
IKO Permatec Anti-Root



A special anti-root formulation of the IKO Permatec compound for use in green roof specifications. It is hot-applied to the prepared substrate using squeegees to a total nominal thickness of 6mm.

Size	12kg in polypropylene wrapper
Product code	24116080

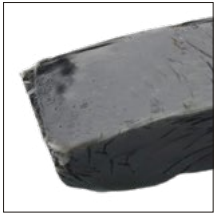
IKO Permatec LI



A specially-formulated combination of bitumen, synthetic rubbers, fillers and other additives with the added benefit of delivering a reduction of embodied carbon of over 50% compared to our standard IKO Permatec system. It is hot-applied to the prepared substrate using squeegees to a total nominal thickness of 6mm.

Size	12kg in polypropylene wrapper
Product code	24120080

IKO Permatec LI Anti-Root



A special anti-root formulation of the IKO Permatec LI compound for use in green roof specifications with the added benefit of delivering a reduction of embodied carbon of over 50% compared to our standard IKO Permatec system. It is hot applied to the prepared substrate using squeegees to a total nominal thickness of 6mm.

Size	12kg in polypropylene wrapper
Product code	24126080

IKO PERMATEC SYSTEM PRIMERS & REINFORCEMENT SHEET

IKO Permatec Polymer Primer

A synthetic rubber-based primer for use on concrete and other substrates prior to the installation of IKO Permatec.

Coverage	4m²/ltr
Size	25ltr (drum)
Product code	24602500

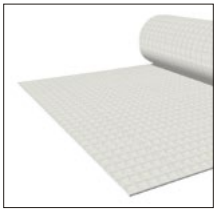
IKO Permatec High Penetration Primer

A specially-formulated bitumen primer for use on concrete and other surfaces prior to the installation of the IKO Permatec system.

Coverage	6-8m²/ltr
Size	25ltr (drum)
Product code	24600025

IKO Permaflash-R

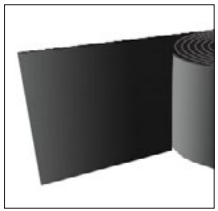
A 55g/m² polyester reinforcement sheet that provides high tensile strength. It is installed between the two applications of IKO Permatec compound.



Roll size	200m x 1m
Roll weight	11kg
Product code	24991000

IKO PERMAFLASH DETAILING

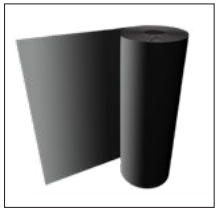
IKO Permaflash-D150



A flexible bitumen polymer detailing strip that is designed to reinforce upstands, change of angle details and minor movement joints, as well as accommodate subsequent differential movement. It is bedded into a coat of IKO Permatec followed by the full IKO Permatec system.

Roll size	20m x 0.15m
Roll weight	4.8kg
Product code	24150000

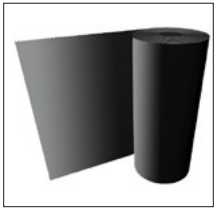
IKO Permaflash-D500



A flexible bitumen polymer detailing sheet that is installed to rainwater outlets. It is bedded into a coat of IKO Permatec followed by the full IKO Permatec system.

Roll size	20m x 0.5m
Roll weight	16kg
Product code	24500000

IKO Permaflash-UN



A highly flexible, uncured neoprene rubber reinforcement sheet that is used at construction joints and where minor structural movement is anticipated. It is bedded in hot IKO Permatec prior to installing the IKO Permatec waterproofing system.

Roll size	30m x 0.3m
Roll weight	21kg
Product code	24600000

IKO PERMAGUARD BITUMEN PROTECTION MEMBRANES

IKO Permaguard-F

A sand-surfaced 175g/m² polyester-based bitumen membrane. It is installed as a protection layer into the final coat of the IKO Permatec while it is still hot.

Roll size	20m x 1m
Roll weight	42kg
Product code	24010000

IKO Permaguard-M Torch-on (T-O)

A high performance torch-applied SBS-modified bitumen membrane with a 270g/m² polyester fibre carrier. It has a black mineral finish on the upper surface and a thermos-fusible film on the underside. It is torch applied as a protection layer to IKO Permatec on exposed upstand details.

Roll size	8m x 1m
Roll weight	36kg
Product code	24030008

IKO ROOFGARDEN 4 SBS AD/F CAP SHEET

IKO Roofgarden 4 SBS AD/F Cap Sheet

A high performance cap sheet consisting of a polyester base that has been coated with SBS-modified bitumen. The bitumen coating contains a specially-formulated anti-root treatment, which prevents the penetration of roots from a range of plants and shrubs. It is used as the final layer in roof gardens and is an alternative to IKO Permatec Anti-Root compound.

Accreditation	EN13948
Roll size	1m x 7.5m
Weight	43kg
Product code	01520321

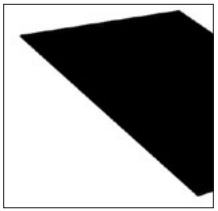
IKO PERMAGUARD SYSTEM PROTECTION BOARDS

IKO Permaguard-PB

A 3.2mm thick protection board fabricated with a bituminous core of non-woven glass fibre reinforcement. It exhibits high strength, excellent puncture resistance and a non-compressible nature. IKO Permaguard-PB is installed into the final coat of IKO Permatec Compound while it is still hot. The boards must be tightly butted and the joints sealed with hot IKO Permatec compound, which is applied with a wide blade scraper.

Standard size	1.22m x 1.22m (1.48m^2)
Unit weight	7.31kg (board)
Nominal weight	4.94kg/m2
Product code	00910004

IKO Permaguard-HDPB (Heavy Duty)



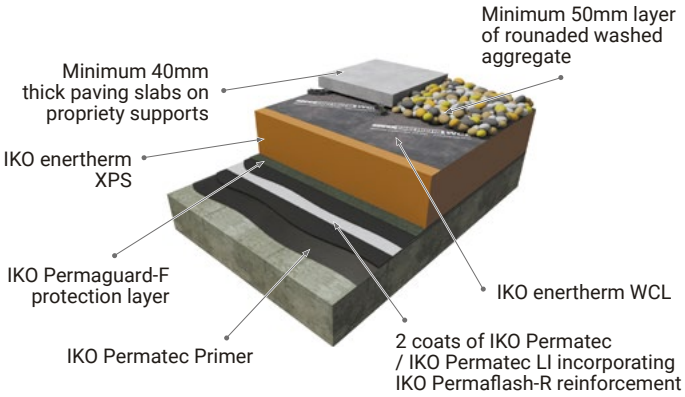
A 3mm high density polymeric protection board. Extremely tough, it offers high impact resistance and is used in heavy duty situations. IKO Permaguard-HDPB is installed into the final coat of IKO Permatec compound while it is still hot.

Boards must be tightly butted and the joints sealed with hot IKO Permatec compound, which is applied with a wide blade scraper.

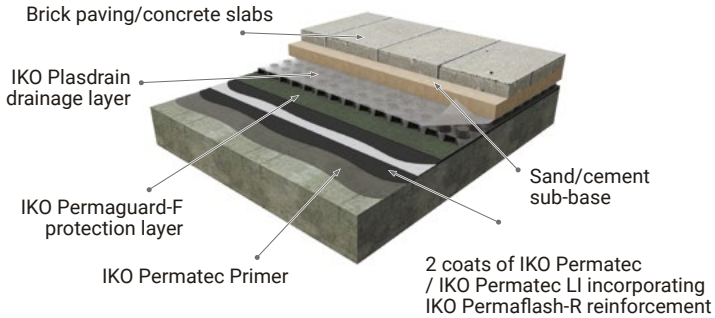
Standard size	2m x 1m
Unit weight	10.5kg
Nominal weight	5.25kg/m^2
Product code	62530000

TYPICAL IKO PERMATEC SYSTEM BUILD UPS

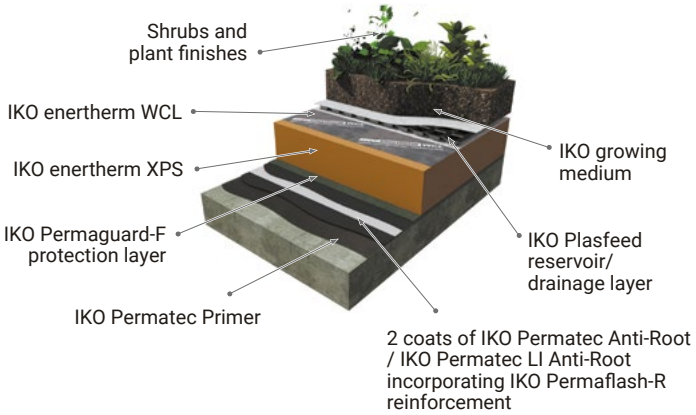
Inverted roof



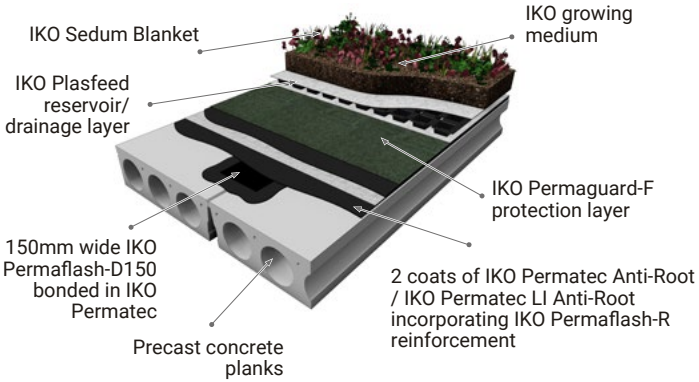
Podium roof



IKO Elements Intensive Green Roof



IKO Elements Extensive Green Roof



FOAMGLAS BUILD UP

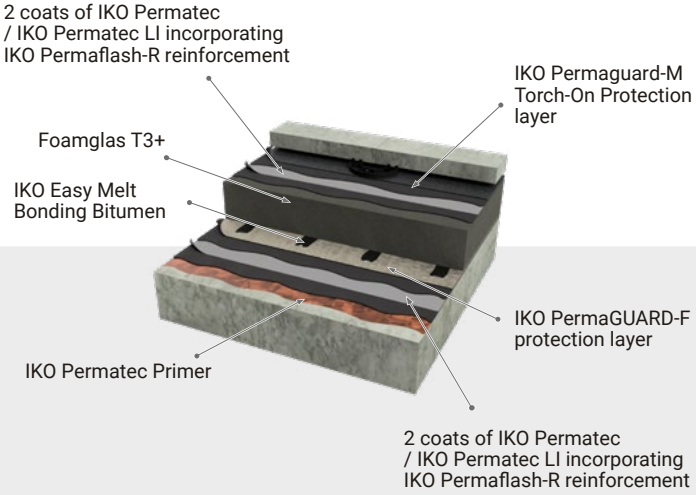
Inverted Roof Insulation
Foamglas T3+ Cellular Glass

FOAMGLAS® cellular glass insulation - long lasting thermal performance, ecellent compressive strength and non-combustibility. T3+ is extremely popular for applications upon walls, soffits and flat roofs.

A protected inverted roof build-up consists of:

- IKO Permatec system
- Bonded Foamglas T3+
- IKO Permatec system with Permaguard-M protection layer

The Foamglas is to be bonded to the primary IKO Permatec system using IKO Easy Melt Bonding Bitumen. This comes in blocks and is to be melted on site using a purpose-built bitumen boiler.



PRE-INSTALLATION NOTES

These guidelines cover the installation of IKO Permatec hot melt waterproofing system and associated ancillary products.

IKO PLC cannot be held responsible for unknown site conditions or the performance of materials other than those manufactured, supplied or marketed by IKO PLC.

The structure must be sound and designed to accept the imposed loading of the waterproofing system, landscaping finishes and associated installation procedures.

IKO Permatec should only be installed by an IKO-registered Permatec installer on behalf of an IKO-registered or IKO-approved contractor and in line with an agreed IKO specification.

Adequate protection should be afforded the newly-installed IKO Permatec against damage caused by following trades.

Before the works proceed, the roofing contractor must ensure the surfaces where IKO Permatec is applied are acceptable and that the specification conforms to the requirements.

IKO Permatec can be installed within a wide ambient temperature range and must be installed to a dry clean substrate. The application of IKO Permatec must NOT proceed during inclement weather. IKO Permatec is not affected by rain, snow or frost immediately after application.

The proper application of IKO Permatec is important to the success of the installation. This success is enhanced by proper preparation of the substrate and membrane.

The substrate must be dry and clear of all surface contaminants, such as unapproved curing compounds, form release agents, oils, dirt, etc. Any surface irregularities likely to inhibit IKO Permatec from being applied as a continuous monolithic membrane should be removed and either replaced or properly repaired.

The installer should thoroughly inspect the surfaces over which the IKO Permatec is to be applied **BEFORE** commencing with the application. Any identified deficiencies should be reported to the Principal Contractor so that they can be corrected. No work should begin until all of the reported deficiencies have been rectified.

IKO's Technical Department is available to provide suitability and specific advice – call 01257 256888

IKO PERMATEC PERSONAL PROTECTIVE EQUIPMENT (PPE) RECOMMENDATIONS

IKO Permatec will adhere to a variety of substrates. The recommended laying temperature is 160°C-180°C.

If it comes into contact with unprotected skin, IKO Permatec will cause burns. It is therefore important to cover all skin areas that could accidentally come into contact with the hot product. The key is to prevent direct contact by wearing a protective layer that can be removed reasonably quickly.

For the latest health and safety data sheets for these specified products visit www.ikogroup.co.uk

Users must conduct their own risk assessment in accordance with the Management of Health and Safety Regulations and implement suitable risk controls. However, based on our experience and practical tests, the following personal protection is recommended:

- Full face visor when adding IKO Permatec into the melter
- Gloves to EN407 contact heat resistant to Class 2 (15 seconds' protection) or rubber-type, liquid tight gloves over a cotton glove. It is important that the gloves are tight fitting around the wrist, but can still be quickly removed, if required
- A fleece top with full length arms. Kevlar sleeves (EN407 flammability resistance class 1) can be worn as an alternative. There should be no gap between the arm cuffs and gloves.
- Full length trousers worn with the bottom covering the boot tops
- Safety boots with tops high enough so that the trouser cuffs always overlap the boot top

SUBSTRATES

IKO Permatec can be applied to a number of substrates, as detailed in the following pages. Application to any other substrate not included in this document must be checked with IKO Technical Services.

IKO does not recommend sand and cement screeds as a substrate to receive IKO Permatec due to the fact they have been proven to be troublesome when it comes to achieving a satisfactory bond. Screeds tend to absorb moisture if exposed to rain and cannot be dried sufficiently to enable the Permatec to adhere.

Drainage falls

IKO Permatec is British Board of Agrément (BBA) certified for use on zero fall decks.

To ensure a finished zero fall, allowance must be made in relation to the design and construction of the structural deck for deflection and construction tolerances.

Substrates that receive IKO Permatec waterproofing system should comply with BS6229:2018. Allowance should be made to remove any backfalls, hollows, depressions or deflections that can prevent effective drainage prior to the first layer of waterproofing being applied.

Where areas are found by a site level survey to have negative falls, i.e. hold water, remedial action should be taken, e.g. localised screed or an additional rainwater outlet.

IN-SITU STRUCTURAL CONCRETE DECKS TO RECEIVE IKO PERMATEC

Concrete specification

In-situ concrete for roof decks should be specified and produced in accordance with BS EN 206 and installed in accordance with BS13670 and the National Structural Concrete Specification.

Normal weight and lightweight concretes are suitable substrates for IKO Permatec. As defined in BS EN 206, normal weight and lightweight concrete should have a density of 2000kg/m³ - 2600kg/m³ and 800kg/m³ - 2000kg/m³, respectively.

Concrete finish

The concrete roof deck should be finished with either a basic or ordinary finish that can be achieved with a skip float (easy float) or power float, as appropriate.

Decks that are deemed suitable to receive IKO Permatec should be free from raised float marks or protruding aggregate that will cause thinning of the IKO Permatec system. Such blemishes will need to be ground flat prior to installing IKO Permatec.

A phenomenon termed 'reinforcement ripple' can occur where the skip float action over the surface moves the mortar and coarse aggregate away from above the reinforcing bar. This can fail to return fully, causing a slight depression to form over the reinforcing bar position and a slightly raised profile between the bars. Reinforcement ripple does not usually have a detrimental effect on the installation of IKO Permatec, but additional thickness of the material will be required to fill the depressions.

Curing

The rate at which concrete dries depends on a number of factors, but is mainly affected by climatic conditions and the water/cement ratio of the mix. Normal weight concrete typically retains 5% moisture when fully cured, and because lightweight concrete aggregates are pre-wetted prior to manufacture, their retained moisture content tends to be higher. This does not have a detrimental effect on the installation of IKO Permatec, but may result in an extended drying time of the concrete.

It is recommended that an in-situ concrete deck is allowed to cure to ensure the concrete has achieved its structural design strength, usually 28 days, prior to installing the IKO Permatec. However, with the agreement of the Principle Contractor, the installation of the IKO Permatec system can commence earlier, subject to successful peel tests (page 46).

Laitance, dusting and curing materials are usually restricted to the surface only, but will need to be removed in order for the IKO Permatec to achieve a suitable bond. Light mechanical brushing is normally sufficient to prepare the surface. However, in more severe cases, shot blasting or scabbling is usually required.

Surface defects

The most common causes of a failed IKO Permatec peel test is the presence of surface laitance (a thin layer of residue left after water evaporation) or dusting of the concrete surface.

There are a number of potential causes:

- Premature surface moisture loss - this can occur, particularly in the summer months, if the surface is allowed to dry out before sufficient hydration of the cement has taken place
- Excessive bleed water affecting the water/cement ratio at the surface
- Frost shortly following placement which affects the surface paste integrity
- Rain shortly after placement – rain has a similar impact to frost, with excessive bleed water affecting the water/cement ratio at the surface. This can usually be identified in the form of dimples within the finished surface
- Curing techniques can also affect the IKO Permatec bond, and procedures involving spray-on waxes should be avoided. If used, they will need to be removed prior to application

Laitance, dusting and curing materials are usually restricted to the surface only, but will need to be removed in order for the IKO Permatec to achieve a suitable bond. Light mechanical brushing will normally be sufficient to prepare the surface. However, in more severe cases, shot blasting or scabbling will be required.

Surface cracks and joints

Cracks less than 3mm wide do not need any specific preparation, but to all structural/shrinkage cracks 3-6mm wide, and all structural joints 6-12mm wide, a strip of IKO Permaflash-D150 should be bonded centrally over the crack/joint in hot IKO Permatec. This should take place prior to the installation of the full IKO Permatec System.

Movement joints

For joints above 12mm wide and structural movement joints, IKO Permaflash-UN or a proprietary expansion joint system specifically designed to accommodate the anticipated movement will be required.

IKO Permaflash-UN is suitable over construction joints and structural movement joints with a maximum width of 25mm and maximum 50% total movement.

For greater widths or movement, a proprietary joint system will be required and designed and installed in accordance with the manufacturer's instructions.

For Permaflash-UN installation instructions, download the Permaflash-UN technical data sheet.

Pre-cast concrete

Composite pre-cast concrete decks require a structural concrete topping which, in order to be suitable to receive IKO Permatec, needs to be finished to the same standard as that specified for cast in-situ concrete.

Where a structural topping is not required, IKO Permatec can be applied directly to the pre-cast concrete units, providing they are finished to a suitable quality. The surface will need to be the equivalent of a skip float or power float finish, and the units installed sufficiently level and even to ensure roof drainage is not adversely impacted.

All joints will need to be filled flush with a suitable proprietary screed or levelling compound and covered with IKO Permaflash-D150 bonded centrally over the joints in hot IKO Permatec prior to installing the full IKO Permatec System.

Where the above conditions cannot be achieved, the pre-cast concrete units will need to be covered with a suitable proprietary screed, such as IKO Permascreed.

NB: Sand and cement screeds should not be used (see page 28 for more detail).

IKO Permascreed

A proprietary hot-applied screed that forms an ideal base for IKO Permatec. It can be used over a wide range of roof decks to improve poor quality substrates, overcome bonding issues and, where necessary, create drainage falls.

Features and benefits:

- Fast application
- Suitable for levelling out uneven roof decks and creating drainage falls, where required
- Avoids the extended curing time associated with cementitious materials
- Can be covered or trafficked once cooled to ambient temperature
- Can be laid to a wide range of thicknesses

Further details can be found in IKO's Permascreed brochure.

Check the suitability of individual products prior to installation by calling IKO's Technical Department on 01257 256888

Plywood and Oriented Strand Board (OSB board)

Plywood decks should comply with BS EN 636:2012, BS EN 13986 and BS 5268-2. These BS EN references must be marked on the boards to ensure full compliance with the standards. Unmarked boards should not be accepted without genuine supporting documentation.

OSB/3 Oriented Strand Board Type 3 should be in accordance with BS EN 300 and BS EN 1995. Boards must be fully compliant to BS EN 13986 and have a CE Marking and/or third party accreditation (e.g. BBA) minimum thickness 18mm.

A strip of IKO Permaflash-D150 must be bonded centrally over all horizontal and vertical board joints in hot IKO Permatec prior to the installation of the full IKO Permatec System.

Cement-bonded particle boards

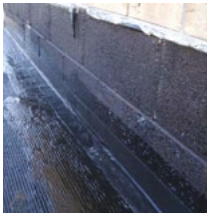
Exterior grade cement-bonded particle boards are light grey in colour and have a hard, smooth and flat surface, making them an ideal substrate for IKO Permatec. Minimum 12mm thickness should be used, which is usually fixed to the top of a profile metal structural deck.

Gypsum-based boards

These boards are generally not considered to be a suitable substrate for the direct application of IKO Permatec.

SUBSTRATES - UPSTANDS

Brickwork/blockwork



A strip of IKO Permaflash-D150 must be installed at the base of brickwork and blockwork upstands in hot IKO Permatec prior to the installation of the full IKO Permatec System.

Metal

A strip of IKO Permaflash-D150 must be installed at the base of metal upstands over the horizontal flange in hot IKO Permatec prior to the installation of the full IKO Permatec System.

Cross Laminated Timber (CLT)

To receive IKO Permatec, Cross Laminated Timber decks need to be overlayed with mechanically-fixed IKO Permaguard-PB. Boards must be butted together in a brick bond pattern with five fixings per sheet to ensure they are held firmly in place and remain flat. Flat-headed fixings should be used to maintain the full thickness of Permatec.

MELTING IKO PERMATEC, IKO PERMATEC LI, IKO PERMATEC ANTI-ROOT AND IKO PERMATEC ANTI-ROOT LI

IKO Permatec must only be melted in a purpose-built hot melt melter with mechanical agitation specifically designed for the preparation of hot-applied rubberised bitumen materials.

Melters must be thermostatically-controlled and capable of maintaining IKO Permatec at the recommended laying temperature of 160°C - 180°C.

The temperature of IKO Permatec must not exceed 190°C.

The installing operatives must be fully trained in the safe operation of the melter. The melter manufacturer's operating instructions must be followed at all times.

At the start of each day, the inside of the melter must be checked for any debris or water, which must be removed before the melting process commences.

Melter manufacturers

Merlin Asphalt Mixers
Unit 12b South Leicester
Industrial Estate,
South Street,
Ellistown,
Coalville,
Leicester
LE67 1 EU
Tel: 01530 264114

WJ Horrod Ltd
1 Leaway,
Lea Bridge Road,
London
E10 7QW
Tel: 020 8539 8746

Imperial Thermal Engineering

Fully electric melters are available to hire.

Bridge Hall Barn,
Hollies Road
Bradwell,
Braintree,
Essex
CM77 8DZ
Tel: 01376 330 582

Melters are also available to hire directly from IKO
Speak to your IKO ABM or contact IKO's Technical Department on 01257 256 888

HANDLING IKO PERMATEC

Transporting to the point of laying

Once the molten IKO Permatec has reached the required temperature, it needs to be transported to the point of laying in metal-lipped buckets, which are an essential piece of equipment within the IKO Permatec installation process.

The buckets must be placed on a firm, level surface during filling. To minimise the risk of spillage, it is recommended the bucket is filled to the base of the lip only.

Cleaning buckets

During installation, a build-up of IKO Permatec will occur around the base and sides of the bucket, which will need to be removed from time-to-time.

The suggested best practice to clean out buckets would be to support an upturned bucket above a bitumen drip tray, which contains approximately 25mm of water.

Heat is then applied to the outside of the bucket using a gas torch. Heat should be applied uniformly to the base and all sides.

NB: During the heating process, the temperature of the IKO Permatec in contact with the metal bucket may well exceed the normal application temperature. The necessary PPE therefore needs to be worn to protect against any splashing of the molten material.

The vast majority of the IKO Permatec Systems will remain solid and the ‘slug’ of material will simply fall into the drip tray.

Once cooled, the bucket can be removed and the IKO Permatec safely handled and put back into the melter.

IKO PERMATEC PEEL TEST

Bond Checks

Before IKO Permatec is applied to concrete decks, IKO Permatec peel tests must be carried out to confirm the suitability of the deck and ensure that the IKO Permatec will satisfactorily adhere to the substrate. If a suitable result is not achieved, remedial steps need to be taken (pages 34 + 48) and IKO Technical Services must be informed.

Peel test procedure

The test is carried out by pouring a small amount of IKO Permatec on to the primed concrete substrate. It should be spread to a thickness of approximately 3mm and cover approximately 300mm x 300mm.

Cover with a piece of IKO Permaguard-F, ensuring that at least one side overhangs the hot IKO Permatec, and press it firmly into the hot IKO Permatec.

Allow the IKO Permatec to cool completely before checking the bond strength. The bond to the substrate is checked by folding back the loose edge(s) of IKO Permaguard-F and pulling it towards you.

If it is not possible to remove the IKO Permatec without distorting the membrane, then the substrate is suitable to receive IKO Permatec and the works can commence.

Common reasons for tests failing:

- Substrate is not dry (i.e. concrete has not fully cured or is wet from rain, snow, frost, dew or condensation etc.) Ensure that adequate curing time is allowed and the surface has fully dried prior to repeating the test
- Substrate is not clean (i.e. dirt, dust, oil, liquid membrane curing compounds, form release agents etc.) They will need to be removed prior to repeating the test
- Substrate is too smooth and needs to be scabbled
- Weak surface laitance, which will need to be removed prior to repeating the test
- Primer was not allowed to dry properly - ensure that the primer has fully dried prior to repeating the test and make sure it is allowed to dry naturally. Gas torches must not be used to dry primer

Successful peel test example

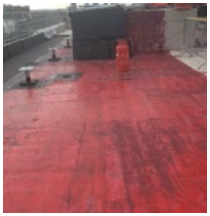
Failed peel test - easily pulled from the substrate

If the IKO Permatec has a suitable bond to the substrate initially, or after corrective remedial steps have been taken, the application of the membrane can proceed. Frequent bond checks throughout the application of the membrane should be conducted to ensure an adequate bond is being obtained.

If bonding problems persist after corrective action has been taken, contact IKO's Technical Department on 01257 256 888.

PRIMING

IKO Primers



Concrete, brickwork and blockwork substrates must be primed with IKO Permatec Polymer Primer or IKO Permatec High Penetration Primer (page 10).

IKO Permatec Primers can be applied by brush, roller or squeegee. Typical curing time is one hour for IKO Permatec Polymer Primer and four hours for IKO Permatec High Penetration Primer, depending on the ambient temperature with a minimum application temperature of 5°C.

Allow the primer to cure naturally - do not use gas torches to cure the primer.

Once cured, the normal use of a gas torch to dry moisture from the surface is acceptable.

IKO Permatec compound must not be applied to wet primer.

Timber and metal substrates do not usually require priming.

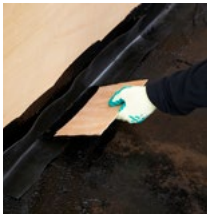
IKO PERMATEC INSTALLATION AND DETAILING

General

IKO has a comprehensive range of IKO Permatec details, which are available from IKO Technical Services.

All detailing works are to be carried out as separate items, ideally before installing IKO Permatec over the main field area of the roof. All of the upstand details should be a minimum of 150mm above finished surface levels and all surfaces to which IKO Permatec is to be applied must be clean and dry.

IKO Permaflash-D150 application



At all changes in substrate materials, all structural/ shrinkage cracks 3-6mm wide, and at all structural joints 6-12mm wide, a strip of IKO Permaflash-D150 must be fully bonded centrally over the transition in hot IKO Permatec. This should take place prior to the installation of the full IKO Permatec System.

Application to upstands

Using a spreader made of hardboard or thin plywood (approximately 200mm x 300mm) the hot IKO Permatec compound is poured in a line along the base of the detail. The material is then pulled up the vertical surface to the desired height using the spreader. Three passes will ensure a nominal coat thickness of 3mm. A nominal 200mm wide strip of IKO Permatec must also be applied to the deck at the base of the upstand to receive the IKO Permaflash-R polyester reinforcement.

Detailing continued

The Permaflash-R polyester reinforcement is embedded into the IKO Permatec compound while it is still hot.

The IKO Permaflash-R must extend at least 150mm on to the flat. Laps in the IKO Permaflash-R should be at least 75mm and fully sealed by the IKO Permatec compound.

Taking the spreader used for the first coat, the second coat is applied in the same manner, ensuring complete coverage of IKO Permaflash-R at the nominal coating thickness of 3mm.

The IKO Permaguard-F protection layer should be applied to the hot IKO Permatec as quickly as possible, ensuring there are no air pockets.

The IKO Permaguard-F must extend at least 75mm on to the flat.

Laps in IKO Permaguard-F protection are to be minimum 75mm and fully sealed using hot IKO Permatec.

Exposed IKO Permatec upstands must always be protected by IKO Permaguard-M, IKO Roofgarden 4 SBS AD/F Cap Sheet.

IKO RAINWATER OUTLETS

Metal rainwater outlets, fitted with clamping rings and pebble guards, are recommended for use with IKO Permatec.

They must be securely fixed to the deck and correctly connected to downpipes. The substrate around the outlet bowl and flange should be recessed to allow the outlet to be lower than the deck surface.

Prior to the installation of the full IKO Permatec System, IKO Permaflash-D500 should be bonded in hot IKO Permatec to the substrate and into the bowl of the rainwater outlet. IKO Permaflash-D500 should extend at least 50mm Into the mouth of the outlet. Smooth out wrinkles and press into IKO Permatec to exclude air

The first coat of IKO Permatec is then applied followed by the IKO Permaflash-R, which should be embedded into the IKO Permatec while it is still hot.

The IKO Permaflash-R should be continued into the bowl of the outlet.

The second coat of IKO Permatec is applied as soon as possible and must fully cover the IKO Permaflash-R reinforcement. Spread evenly, the second coat is also applied at a nominal thickness of 3mm.

NOTE: IKO Permaflash-R must not be left exposed at the end of each day or if rain is expected.

The second coat of IKO Permatec must be covered by the IKO Permaguard-F Protection Layer as quickly as possible, ensuring that the protection sheet is dressed sufficiently into the bowl of the outlet and trapped beneath the clamping ring.

Finish the outlet with a clamping ring and gravel guard.

IKO PERMATEC PITCH POCKETS

IKO Permatec Pitch Pockets should be used to waterproof protrusions, such as handrail stanchions, man-safe posts, I-beams, etc.

A minimum 50mm high galvanised metal former is bonded in hot IKO Permatec around the protrusion. The former can be any shape and size, but must extend at least 20mm beyond the base of the protrusion and must be deep enough to ensure a minimum 10mm covering of IKO Permatec over the over fixings.

The metal former is secured by straps of IKO Permaflash-D150 bonded in hot IKO Permatec. If necessary, mechanical fixings can also be used to secure the former.

The former is then filled flush with hot IKO Permatec. Depending on the size, several pours may be required, leaving the IKO Permatec to cool each time.

Once filled, IKO Permaguard-F should be applied to the top and sides of the pitch pocket and bonded to the surrounding flat to complete the detail.

METAL PIPE FLASHING

Ensure that metal pipes are free from grease, rust, etc. by cleaning them with a wire brush.

A strip of IKO Permaflash-D150 is applied around the base of the pipe and fully bonded in hot IKO Permatec.

Two coats of IKO Permatec, incorporating IKO Permaflash-R, are applied to the pipe.

The height of the IKO Permatec System should be at least 150mm above the finished roof level.

Exposed pipe flashings must be protected with IKO Permaguard-M Protection Sheet, which is applied by controlled torch application and the upper edge protected with a cover flashing to complete the detailing.

Plastic pipes

A galvanised steel pipe sleeve should be fitted around plastic pipes prior to the IKO Permatec Pipe Flashing being applied. The height of the pipe sleeve should be at least 150mm above the finished roof level, with the upper edge protected with a cover flashing fixed to the pipe.

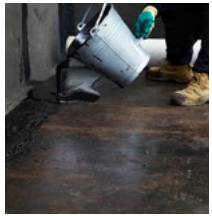
IKO PERMATEC INSTALLATION - HORIZONTAL SURFACES

General

The application of the IKO Permatec compound should be conducted in a carefully planned, methodical manner to assure proper control of the membrane's thickness.

However, regular thickness tests must always be carried out, as detailed on page 66.

Applying a first coat of IKO Permatec



The spreading of IKO Permatec is carried out using a rubber-bladed squeegee. Pour a bucket of hot IKO Permatec along the one edge of the area to be covered. As a guide, a standard, 3 gallon lipped bucket, filled to the base of the lip will cover an area of approximately 2.5m x 1.1m at a nominal 3mm thickness.

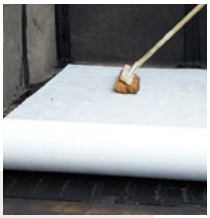
Using the squeegee, pull the hot IKO Permatec compound towards you in a methodical manner, ensuring that it covers the substrate beyond the width of the IKO Permaflash-R Reinforcement, which is 1m wide.

Once the whole bucket has been brought towards you, push the molten material back over the area. Now pull the entire line of hot IKO Permatec Compound back across the grid to achieve the required thickness of 3mm (nominal). Do this over the entire grid. Make at least three passes with the squeegee. This is the most effective way to control the correct thickness of the IKO Permatec membrane.

Reinforcement

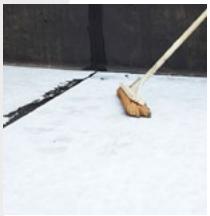
After each bucket, IKO Permaflash-R should be embedded into the compound while it is still hot. Unroll the IKO Permaflash-R and lay it into the IKO Permatec compound, keeping it pulled tight to minimise folds and wrinkles.
Do not 'pour and roll' the IKO Permaflash-R into the hot IKO Permatec.

As the IKO Permaflash-R is being installed, it should be brushed into the hot IKO Permatec, taking care to avoid air pockets, folds or wrinkles in the fabric.



Once one row of the IKO Permatec membrane and fabric has been applied, another row can be started. The membrane should overlap the fabric from the preceding row by approximately 100mm, enabling the next roll of IKO Permaflash-R to be embedded into the membrane to form a minimum, fully-bonded 75mm overlap between the two sheets of fabric.

NOTE: IKO Permaflash-R must not be left exposed at the end of each day or if rain is expected.



Adding a second coat of IKO Permatec

The second coat of IKO Permatec should be applied as soon as possible, using the same procedure for the first coat to a nominal thickness of 3mm, and must fully cover the IKO Permaflash-R reinforcement

Ensure that the IKO Permatec membrane is taken beyond the width of the IKO Permaguard-F protection sheet on both edges, which is also 1m wide.

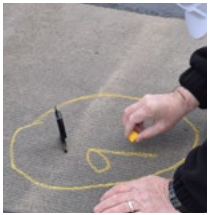
Unroll the Permaguard-F protection sheet into the area of installed IKO Permatec while it is still hot and tacky. Do not apply IKO Permaguard-F using the 'pour and roll' method.

With subsequent rows, ensure that the second coat of IKO Permatec overlaps on to the preceding row by approximately 100mm, enabling a minimum 75mm sealed lap to be formed.

Using a wide blade scraper, make sure that the laps in the IKO Permaguard-F protection sheet are fully sealed.

THICKNESS TESTING

Achieving the required thickness



To ensure that the required coverage rate is being achieved, IKO recommends that the thickness of the installed IKO Permatec System is checked every 25m², using a tyre tread depth gauge.

Place the gauge on the upper surface of the horizontal protection sheet and force the plunger through the IKO Permatec System down to the structural deck. Without removing the gauge, note the thickness.

Record the thickness

Record the result next to the test point. The thickness of the IKO Permatec, minus the protection sheet, should be a nominal 6mm, but never less than 5mm.

Therefore the system thickness, including the protection layer, should be in accordance with the following table:

Protection layer	Thickness	Nominal total System thickness	Minimum system thickness
IKO Permaguard-F	1.5mm	7.5mm	6.5mm
IKO Permaguard-M	3.5mm	9.5mm	8.5mm
IKO Roofgarden AD/F	4.0mm	10.0mm	9.0mm
IKO Permaguard-PB	3.2mm	9.2mm	8.2mm
IKO Permaguard-HDPB	3.0mm	9.0mm	8.0mm

Ensure that the hole made by the gauge plunger is sealed by applying pressure to the surface. The rounded end of a screwdriver handle is ideal for this.

NB: Failure to achieve the specified minimum system thickness will result in overlaying the identified roof area with an additional coat of IKO Permatec and specified protection sheet.

POST-INSTALLATION CHECK

Electronic leak testing

Unless specifically approved otherwise by IKO Technical Services, the integrity of the completed IKO Permatec System must be confirmed by means of an electronic integrity test to show that the waterproofing is free from punctures and defects.

The roofing contractor should include a sum for such a test within their quotation.

The testing should be carried out immediately before the application of the insulation and surface finishes.

If any defects are discovered, the locations should be clearly identified to enable the IKO Permatec-registered contractor to carry out the necessary repairs.

The areas should be re-tested to verify the integrity of repair.

NB: The issuing of the IKO guarantee is conditional upon the provision of a leak test certificate.

Protection from following trades

Completed areas of IKO Permatec must be protected from damage prior to installing the specified surface finishes.

The system must be protected against damage caused by spillages of solvents, oil, fuels, etc. and sharp objects, such as nails, fixings, trims, glazing panels, etc. Where it is necessary to temporally place plant materials or equipment directly on to the IKO Permatec waterproofing, a minimum 18mm plywood should be used.

REPAIRING DAMAGED AREAS

Easily repaired

Damaged areas of the completed IKO Permatec waterproofing can be easily repaired.

Where possible, the protection layer should first be carefully removed, exposing not only the damaged membrane, but also at least 75mm in all directions from it. If the protection layer cannot be removed without causing further damage to the underlying IKO Permatec, the upper surface should be carefully heated with a gas torch to 'sweat' the bitumen within it.

Hot IKO Permatec can then be applied to the damaged area, extending at least 75mm on to the surrounding protection area. The IKO Permatec should be applied in one coat - minimum 3mm thick -followed by a new protection layer embedded into the membrane while it is still hot and tacky.

Application summary

- Ensure surfaces are clean and dry
- Carry out a bond test on in-situ structural concrete or screeded decks
- Apply IKO Permatec Primer to concrete, brickwork,blockwork substrates and cement bonded particle board
- Maintain IKO Permatec within the application temperature range 160 - 180°C. Ensure IKO Permatec is applied at nominal 6mm thick in two coats
- Ensure minimum 75mm fully bonded laps in reinforcement and protection sheets
- Carry out thickness checks every 25m^2
- Protect completed areas against damage

INSULATION AND WFRL INSTALLATION

IKO enertherm XPS insulation

A rigid, extruded polystyrene (XPS) insulation, IKO enertherm XPS is used for the thermal insulation of a wide variety of flat roofs, including an inverted roof below ballast or paving slabs, or a green/ garden roof.

Boards should be laid in a staggered, brick bond pattern, ensuring all joints between the boards are tight and that no gaps exist where they meet roof lights, edge details and other services that perforate the roof deck.

IKO enertherm WCL (Water Control Layer)

IKO enertherm WCL is a water flow-reducing layer (WFRL) used as part the IKO enertherm XPS system, which reduces the flow of water during roof construction and eliminates the impact of rainwater cooling on thermal performance.

IKO enertherm WCL must be laid with 300mm laps, overlapping in the downward direction of the flat roof slope. At upstands and penetrations, the membrane must be turned up 50mm to finish above the surface of ballast layers. At drainage outlets, the membrane must be turned down.

For further guidance, please refer to the Liquid Roofing & Waterproofing Association (LRWA) Guidance Note no. 14 – Best Practice for the Installation of Water Flow Reducing Layers in Inverted Roofs.

MAINTENANCE, INSPECTION, TESTING & REPAIR

IKO Permatec flat roof maintenance notes

A routine care and maintenance programme is fundamental to the long-term performance of the waterproofing system. The building owner is responsible for ensuring that regular maintenance of the waterproofing is undertaken in line with this document.

As with all flat roofing and waterproofing systems, it is essential proper and adequate maintenance is undertaken at routine intervals to ensure long-term performance and life expectancy. This is an integral part of the terms and conditions of any guarantee. Any defects found to the waterproofing must be highlighted and notified to IKO's Guarantees Department at customersupport@iko.com in accordance with the terms and conditions of the IKO guarantee.

Safe access to the roof must only be allowed by arrangement and supervision of the person responsible for the building. The building owner or client is responsible for providing safe access to and from the roof. All persons given access to the roof must be instructed to use dedicated access and walkways and be fully advised on the health and safety procedures required for each roof area.

Maintenance, inspection, testing and repair

A flat roof or waterproofing system, which has been designed and installed in accordance with the recommendations of British Standard BS6229 and relevant flat roofing trade associations guidance, should be expected to provide a trouble-free service for many years, providing it is properly maintained. Maintenance inspections should be carried out annually by a competent person.

IKO Technical Services recommend that their flat roofs and waterproofing systems are inspected and maintained in accordance with the guidelines given in BS6229.

BS6229: gives guidance on the content of maintenance manuals and the scope and frequency of routine maintenance inspections applicable to all flat roofing and waterproofing finishes. All roofs should be inspected at least once a year; ideally, there should be inspections each spring and autumn, to enable the effects of annual extremes of weather to be checked. Roofs exposed to high levels of pollution or in close proximity to trees may require more frequent inspections.

Any roof inspections should cover the interior of the building - for signs of water penetration or condensation – as well as alterations that may have affected the roof. Externally, abutting construction, which can affect the performance of the roof, should also be inspected.

An inspection should also be carried out if one or more of the following situations have occurred.

- Recent construction on or adjacent to the roof.
- New roof-mounted equipment installed on the roof.
- Unusual weather conditions, such as very high winds or unusually heavy snow.
- Following a fire, vandalism or other known damage to an adjacent roof area.

Maintenance checklist

During the course of regular maintenance inspections the whole of the roof and waterproofing should be systematically checked and a note made of any items requiring attention. For example:

a) General area - examine the entire general roof area and note any areas of stress, signs of blistering, ruckling or any indications that the roofing is detached from the substrate. Record the extent and type of any defects and notify IKO Technical Services of such findings. Check for any loose or unbonded laps and areas of repair.

b) General area – check for signs of debris, leaves, algae and areas of overhanging trees. Lightly sweep and remove from the waterproofing finish, check any internal rainwater outlets for signs of blockages replace any missing leaf guards for drainage locations.

c) Drainage - inspect all gutters and rainwater outlets and discharge points. Ensure they are clean and that water discharge from the roof is uninterrupted. Carefully examine the junction between the roof waterproofing and rainwater outlets. Note any apparent defects or signs of silting or ponding. Check internal rainwater goods for blockages or buildup of debris. Check leaf guards are secure and in place.

d) Internal - check inside the building for any staining or indication of damp penetration or condensation, which could be related to the roof.

e) Surface protection - check that the surface protection layer is in place and complete. Note any wind scour, displacement of ballast, cracked or damaged tiles. Check for any wind damage to the waterproofing or components upon the roof.

f) Upstands - check that upstands are intact, fully adhered and adequately protected. Note any areas of distortion or stress and any blistering.

g) Flashings - check that flashings are intact and fully secured with sealant/mastic pointing complete.

h) Penetrations - inspect the membrane around each penetration; ensure that flashings and upstands are intact. Check if further penetrations have been undertaken since the waterproofing has been completed.

i) Edge trims - check for signs of movement, displacement or stress, particularly at the joint between the roof waterproofing and trims.

j) Cappings - check for signs of movement, displacement or stress.

k) Protection - restrict and prevent unauthorised access to the roof to prevent the possible risk of abuse and damage to the roof. Allow only competent persons to access the roof, and ensure those undertaking any repair works are specifically trained and experienced in the type of waterproofing involved.

l) Damage - check for damage to the waterproofing by other trades, such as cable penetrations, satellite dishes or PV solar panels, or vandalism, ducting installed or roof-mounted equipment after the waterproofing has been completed.

Other items

Mastics, sealants and gaskets are deemed as being maintenance items and are not covered by the IKO guarantee. Consideration to any necessary repair or replacement should be undertaken every five years.

During any maintenance to any roof-mounted equipment or components of the building fabric, the waterproofing must be protected against damage caused by spillages of solvents, oils, fuels etc. or sharp objects, such as nails, fixings, glazing etc.

Accidental damage to the waterproofing must be reported to IKO at customersupport@iko.com immediately to allow a practical method of repair to be undertaken.

Repairs

Where an IKO guarantee has been issued, no roof repairs should be carried out without first referring to IKO's Technical Services guarantee department as described in the guarantee text. All repairs or modifications must be agreed in writing by IKO Technical Services and undertaken by the original installing contractor.

Repair procedure

Repairs should only be carried out after the type and extent of any defects have been noted and their underlying cause identified. The intention of repair work should be to restore the roofing to its original condition and ensure continuing performance. All repairs should therefore be carried out in materials, and with accessories and standards of workmanship, compatible with the original installation.

All silting, debris and plant life should be removed and the whole of the roof left clean. For areas where there is algae or moss growth, it might be advantageous to apply a compatible fungicidal wash.

On completion of all necessary repair work, the roof should be re-inspected and the nature and extent of all repair work recorded.

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