July 2019

IKO permatec®

Hot Melt Waterproofing System

System Installation Guidelines

IKO

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 Systems.

130 Years of Knowledge

IKO continues to remain committed to its family values of entrepreneurial spirit, craftsmanship and innovation in roofing, waterproofing and insulation that were the foundation of the business in 1951, as envisioned by IKO founder, Israel Koschitzky.

IKO is a truly Global enterprise, distributing products to 96 countries around the globe with manufacturing plants in Canada, United States, United Kingdom, Belgium, Holland, France and Slovakia.

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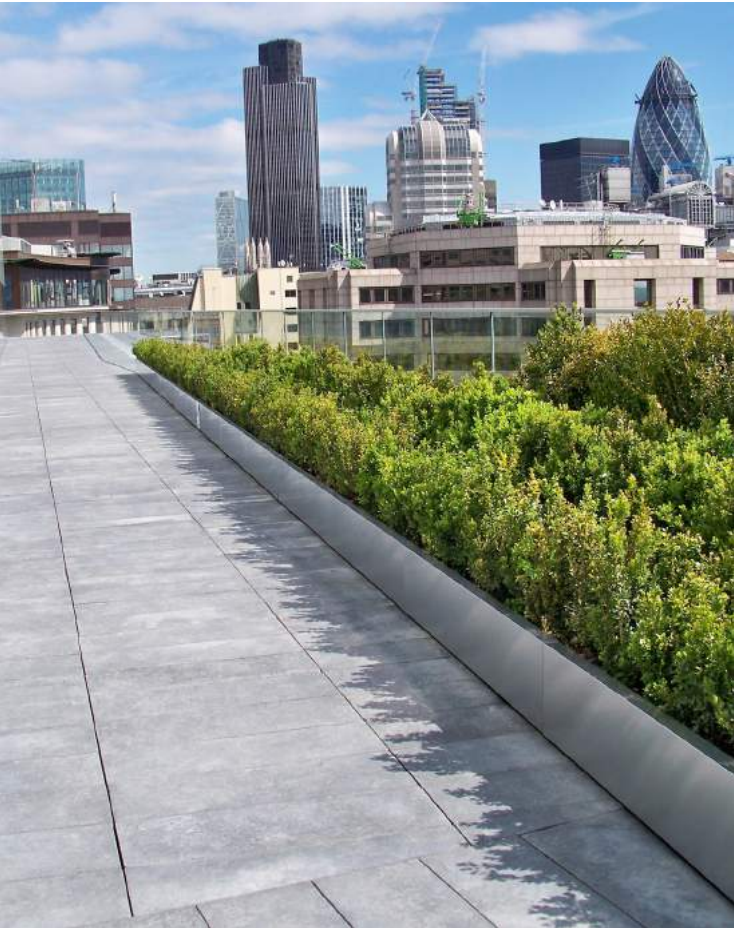


IKO Permatec Hot Melt Monolithic Waterproofing Systems

IKO Permatec Hot Melt Monolithic Waterproofing Systems comprise of IKO Permatec Ecowrap or IKO Permatec Anti-Root hot melt waterproofing compounds, specially formulated combinations of refined bitumen, synthetic rubbers, fillers and other additives, which are hot-applied in conjunction with carefully selected reinforcement/ detailing fabrics and protection layers to give the ultimate waterproofing performance.

Installed by a nationwide network of IKO Registered Permatec Installers, IKO Permatec provides, tough, flexible, waterproof membrane for flat (including zero falls inverted roofs, podiums, green roofs, blue roofs and protected vehicle decks. IKO Permatec if also suitable for use as a damp-proof membrane in solid concrete floors or as the waterproofing layer in a typical sandwich membrane used for above or below ground waterproofing in concrete, brick or blockwork structures.

NB: IKO Permatec Anti-Root is suitable for all Green Roof, Biodiverse Roof and Roof Garden Systems.

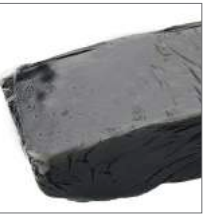
Features and Benefits

- Hot applied system
- BBA Certified No. 03/4009 including zero fall decks
- Outstanding durability - lasts the design life of the building
- Nominal membrane thickness of 6mm
- Tough and resistant to impact damage
- Excellent low temperature flexibility
- Applied directly to substrate
- Homogeneous and seamless
- 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)
- Virtually no packaging to be disposed of (zero wrapper waste)

IKO Permatec System Compounds

IKO Permatec Ecowrap Compound

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



Product Details

Size	12kg in polypropylene wrapper

IKO Permatec Anti-Root Compound

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

Product Details

Size	12kg in polypropylene wrapper

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.

Product Details

Coverage	4m²/ltr
Size	25ltr (drum)

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.

Product Details

Coverage	6-8m²/ltr
Size	25ltr (drum)

IKO Permaflash-R

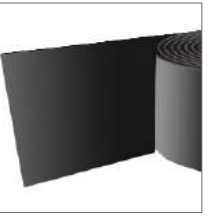
A 55g/m² polyester reinforcement sheet, provides high tensile strength. Installed between the two applications of IKO Permatec Compound.

Product Details

Roll Size	200m x 1m
Roll Weight	11kg

IKO Permaflash Detailing

IKO Permaflash-D150

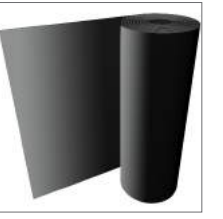


A flexible bitumen polymer detailing strip, installed to reinforce upstands change of angle details and minor movement joints, to accommodate subsequent differential movement. It is bedded into a coat of IKO Permatec followed by the full IKO Permatec System.

Product Details

Roll Size	20m x 0.15m
Roll Weight	4.8kg

IKO Permaflash-D500



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

Product Details

Roll Size	20m x 0.5m
Roll Weight	16kg

IKO Permaflash-UN

A very flexible un-cured neoprene rubber reinforcement sheet 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.

Product Details

Roll Size	30m x 0.3m
Roll Weight	20kg

IKO Permaguard Bitumen Protection Membranes

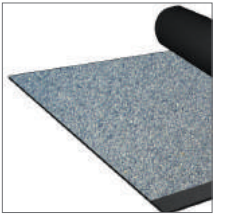
IKO Permaguard-F

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

Product Details

Roll Size	20m x 1m
Roll Weight	39kg

IKO Permaguard-M



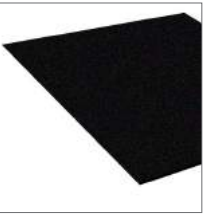
A slate surfaced high performance torch-applied 175g/m² polyester based SBS coated bitumen membrane, with a thermofusable film to the underside. It is torch applied as a protection layer to IKO Permatec on exposed upstand details.

Product Details

Roll Size	8m x 1m
Roll Weight	35kg

IKO Permaguard System Protection Boards

IKO Permaguard-PB

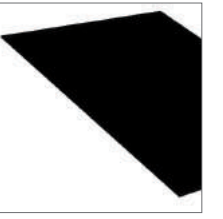


A 3.2mm thick protection board fabricated with a bituminous core of non woven glass fibre reinforcement. It exhibits high strength, excellent puncture resistance and non-compressible nature. IKO Permaguard-PB is installed into the final coat IKO Permatec Compound whilst it is still hot. Boards must be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

Product Details

Standard Size	1.22m x 1.22m (1.48m2)
Unit Weight	7.31kg (board)
Nominal Weight	4.94kg/m2

IKO Permaguard-HDPB (Heavy Duty)



A 3mm high density polymeric protection board which is extremely tough with high-impact resistance used in heavy-duty situations. IKO Permaguard-HDPB is installed into the final coat of IKO Permatec Compound whilst it is still hot.

Boards must be tightly butted and the joints sealed with hot IKO Permatec Compound applied with a wide blade scraper.

Product Details

Standard Size	2m x 1m (2m2)
Unit Weight	10.5kg (board)
Nominal Weight	5.25kg/m2

IKO Roofgarden 4 APP AD/F Cap Sheet

IKO Roofgarden 4 APP AD/F Cap Sheet

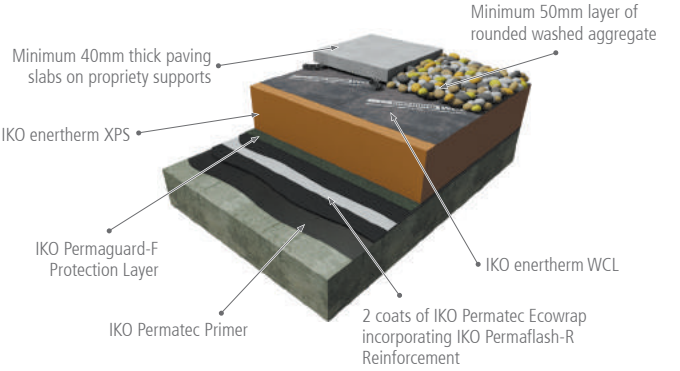
A high performance cap sheet consisting of a polyester base, coated with APP polymer modified bitumen. The bitumen coating contains a specially formulated anti-root treatment, which prevents the penetration of roots from a range of plants and shrubs. Flexible down to minus 20°C. Used as the final layer in a roof garden specification if IKO Permatec Anti-Root Compound is not used.

Product Details

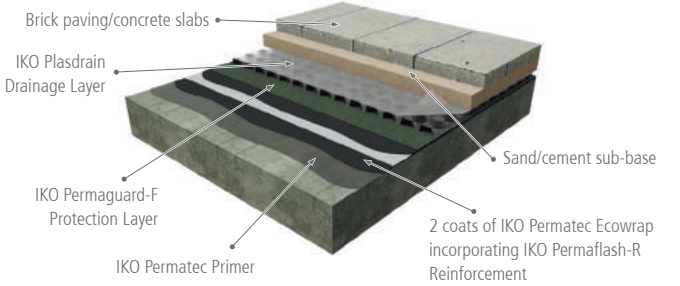
Accreditation	FLL 4-Year Root Penetration Test
Roll Size	1m x 7.5m
Weight	46kg

Typical IKO Permatec System Build Ups

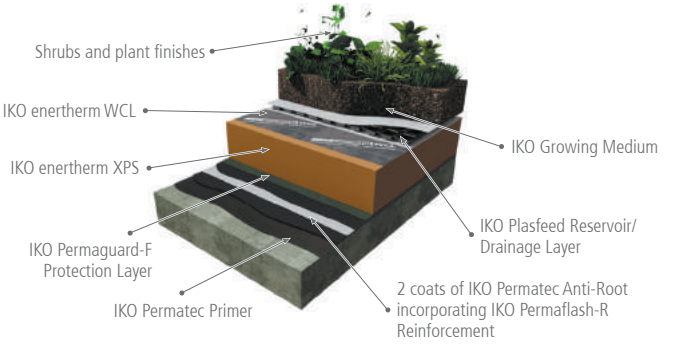
Inverted Roof



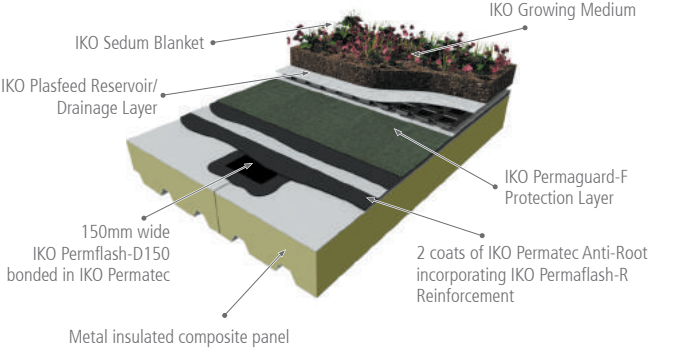
Podium Roof



Intensive Green Roof



Extensive Green Roof



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 for the performance of materials other than those manufactured, supplied or marketed by IKO PLC.

It must be ensured that the structure is sound and designed to accept the imposed loading of the waterproofing system, the 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.

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 to receive IKO Permatec are acceptable and that the specification conforms to the requirements.

IKO Permatec can be installed within a wide ambient temperature range. IKO Permatec 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 its 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 clean 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 deficiencies found should be reported to the Principal Contractor so that they can be corrected. No work should begin until all the deficiencies reported have been rectified.

IKO Technical Department is available to give suitability and specific advice on **01257 256 888**

IKO Permatec Personal Protective Equipment (PPE) Recommendations

IKO Permatec's recommended laying temperature is 160°C-180°C and it will adhere to almost anything.

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

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 can be removed quickly.
- A fleece top with full length arms. As an alternative to full length arms, kevlar sleeves (EN407 flammability resistance class 1) can be worn. There should be no gap between the arm cuffs and the gloves.
- Full length trousers worn with the bottom covering boot tops.
- Safety boots with tops high enough so that trouser cuffs always overlap the boot top.

For latest Health and Safety Data Sheets regarding the specified products
www.ikogroup.co.uk

Substrates

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

Sand and cement screeds are not generally suitable to receive IKO Permatec and should be avoided. All substrates need to be completely clean and dry in order to achieve the required bond.

Drainage Falls

IKO Permatec is British Board of Agrément Certified for use on zero falls decks. In order to ensure a finished zero fall, due allowance must be made in the design and construction of the structural deck for deflection, and construction tolerances.

The recommendations of BS 6229:2018 (Flat roofs with continously supported flexible waterproof coverings - Code of Practice) should be followed.

In-situ Structural Concrete Decks to Receive IKO Permatec

Concrete Specification

In-situ concrete for roof decks shall be specified and produced in accordance with BS EN 206:2013 and installed in accordance with BS13670:2009 and the National Structural Concrete Specification.

Normal Weight and Lightweight concretes are suitable substrates for IKO Permatec. As defined in BS EN 206:2013, Normal Weight and Lightweight concrete shall have a density of 2000kg/m³ - 2600kg/m³ and 800kg/m³ - 2000kg/m³ respectively.

Concrete Finish

The concrete roof deck shall be finished with either a Basic or Ordinary Finish which are achieved with a Skip Float (Easy Float) or Power Float as appropriate.

Decks suitable to receive IKO Permatec should be free from raised float marks or protruding aggregate which 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, will not normally have a detrimental effect on the installation of IKO Permatec but additional thickness of material will be required to fill the depressions.

In-situ Structural Concrete Decks to Receive IKO Permatec

Curing

The rate at which concrete dries will depend 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 will tend to be higher. This will 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 an in-situ concrete deck is allowed to cure to ensure the concrete has achieved it's 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 a successful Peel Tests (ref page 26).

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 Defects

The main 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 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 will affect the surface paste integrity
- Rain shortly after placement – similar affect to excessive bleed water affecting the water/cement ratio at the surface. Usually noticeable within the finished surface as dimples.
- Curing techniques can also affect the IKO Permatec bond and procedures involving spray-on waxes should be avoided or if used 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, 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.

Consult IKO Technical Department for specific advice on **01257 256 888**

Acceptable Substrates

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 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 in order not to adversely affect roof drainage.

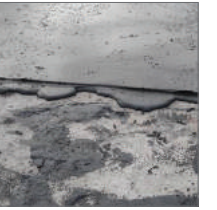
All joints will need to be filled flush with a suitable proprietary screed or levelling compound and covered with IKO Permaflash-D150 bonded centrally over the joints in hot IKO Permatec prior to installing the full IKO Permatec System.

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

Sand and cement screeds should not be used.

Acceptable Substrates

IKO Permascreed



A proprietary mastic asphalt screed which forms an ideal base to receive IKO Permatec. It can be used over a wide range of roof decks to make good poor quality substrates, overcome bonding issues and where necessary create drainage falls.

Features and Benefits:

- Fast application
- Suitable for levelling out uneven roof decks
- Avoids the extended curing time associated with cementitous materials
- Can be covered or trafficked once cooled to ambient temperature
- Can be laid to a wide range of thickness's and to create drainage falls if required
- Easily prepared to receive IKO Permatec

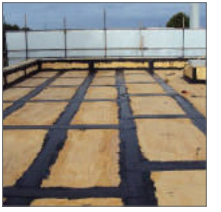
Refer to IKO Permascreed Brochure.

Modified Screeds/Levelling Compounds

Proprietary modified screeds & levelling compounds are available which provide a suitable surface to receive IKO Permatec.

Consult IKO Technical Department as to the suitability of individual products prior to installation on **01257 256 888**

Plywood and Oriented Strand Board (OSB board)



Plywood decks should be in accordance 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 this standard. 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 Board is light grey in colour and has a hard smooth flat surface which makes 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.

Acceptable Substrates

Insulated Roof Deck Panels

Generally insulated roof deck panels are suitable to receive the direct application of IKO Permatec. A strip of IKO Permaflash-D150 must be bonded centrally over all panel joints in hot IKO Permatec prior to the installation of the full IKO Permatec System.

Contact IKO Technical Department on 01257 256 888 for suitability of specific systems.

Brickwork/Blockwork Upstands

A strip of IKO Permaflash-D150 must be installed at the base of Brickwork & Blockwork upstands in hot IKO Permatec prior to the installation of the full IKO Permatec System.

Metal Upstands

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)

CLT provides a suitable substrate to receive IKO Permatec. A strip of IKO Permaflash-D150 must be bonded centrally over all panel joints in hot IKO Permatec compound prior to the installation of the full IKO Permatec System.

Melting IKO Permatec Ecowrap and IKO Permatec Anti-Root

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 be capable of maintaining the IKO Permatec at the recommended laying temperature of 160°C - 180°C.

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

The installing operatives must be fully trained in the safe operation of the melter. The melter manufacturer 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

Handling IKO Permatec

Transporting to the Point of Laying

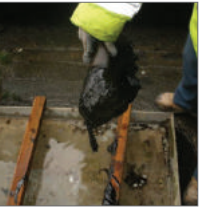
Once the molten IKO Permatec has reached the required temperature, it needs to be transported to the point of laying in metal lipped buckets, which are an essential piece of equipment in the process of installing IKO Permatec.

Ensure that buckets are 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 to the base and around the 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 ensuring that heat is 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 and the necessary PPE needs to be worn to protect against any splashing of the molten material.

The vast majority of the IKO Permatec 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 to ensure that the IKO Permatec will satisfactorily adhere to the substrate. If a suitable result is not achieved, remedial steps need to be taken (ref page 18 + 27), 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 3m 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.

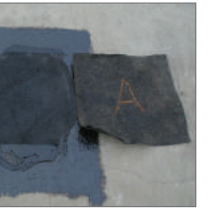
If it is not possible to remove the IKO Permatec without distorting the membrane, then the substrate is suitable to receive IKO Permatec and the works can commence.

Consult IKO Technical Department on **01257 256 888**

IKO Permatec Peel Test

The Most Common Causes Of A Failed Test

- 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 or surface is dried prior to repeating the test.
- Substrate is not clean (i.e. dirt, dust, oil, liquid membrane curing compounds, form release agents etc.). These 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 is fully dried prior to repeating the test but make sure that it is allowed to dry naturally. Gas torches must not be used to dry primer.



Successful peel test example


Failed peel - 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 Technical Department on 01257 256 888.**

Priming the Area

IKO Primers

Concrete, brickwork and blockwork substrates must be primed with IKO Permatec Polymer Primer or IKO Permatec High Penetration Primer (page 6).

IKO Permatec Primers can be applied by brush, roller or squeegee. Typical curing time is 1 hour for IKO Permatec Polymer Primer and 4 hours for IKO Permatec High Penetration Primer, depending on ambient temperature.

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.

Plywood, Metal and Cement Particle Boards do not normally require priming.

IKO Permatec Installation and Detailing

General

IKO have 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 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, 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 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 whilst still tacky. The IKO Permaflash-R must extend at least 150mm onto 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 no air pockets.

The IKO Permaguard-F must extend at least 75mm onto 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, or IKO Roofgarden 4 APP AD/F Cap Sheet or other suitable mineral surfaced membrane.

IKO Rainwater Outlets

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

They must be securely fixed to the deck and correctly connected to down pipes. 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 on to the substrate. 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 whilst it is still hot.

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

IKO Rainwater Outlets

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 so to be trapped beneath the clamping ring.

Finish the outlet with clamping ring and gravel guard.

IKO Permatec Pitch Pockets

IKO Permatec Pitch pockets should be used to waterproofing 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 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. Clean with a wire brush.

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

Metal Pipe Flashing

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.

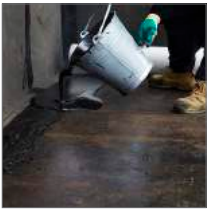
Exposed pipe flashings must be protected with IKO Permaguard-M Protection Sheet which is applied by controlled torch application and the upper edge protected with a cover flashing to complete the detailing.

Plastic Pipes

A metal pipe sleeve should be fitted around plastic pipes to receive the IKO Permatec Pipe Flashing. 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 39.

First Coat 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. Very little downward force should be applied to the squeegee.

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 whilst 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 IKO Permatec Membrane should overlap the fabric from the preceding row by approximately 100mm so that the next roll of IKO Permaflash-R can 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 Second Coat 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 in to the area of installed IKO Permatec whilst 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 so to form a minimum 75mm sealed lap.

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 and additional coat of IKO Permatec and specified protection sheet.

IKO Technical Department is available to give suitability and specific advice on **01257 256 888**

Post Installation Check

Electronic Leak Testing

Unless specifically approved otherwise by IKO Technical Services, on completion 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 his 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 allow the IKO Permatec Registered Contractor to carry out the necessary repairs.

The areas should be retested to verify the integrity of repair.

NB: The issue 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 the IKO Permatec waterproofing, a minimum 18mm plywood should be used as protection.

Repair of 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 can not 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 whilst it is still hot and tacky.

Application Summary

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

IKO Permatec Flat Roof Inspection, Maintenance and Guarantee Guidance Notes

1.0 General

General flat roof maintenance is essential to obtain the maximum performance and ensure the longest life expectancy for the Permatec waterproofing system as a whole. It is also an integral part of our guarantee offer for the project. Any deficiencies should be reported immediately to IKO PLC.

2.0 Access

Access to the roof must only be allowed by arrangement with and under supervision of the Building Manager or the person responsible for building maintenance, in accordance with the Construction (Design & Management) Regulations 2015.

2.1 All personnel given permission to access the roof must be fully advised of the health and safety procedures required by the site or that of the individual roof concerned. Where roof working/access, other than foot traffic is required, adequate protection must be provided to avoid damaging the surface finishes, insulation and underlying IKO Permatec Waterproofing.

3.0 Protection

During routine maintenance to plant or the building fabric, the flat roofing system must be protected against damage caused by spillage of solvents, oil, fuels etc and sharp objects such as nails, fixings, trims panels etc. Where it is necessary to temporary place plant materials, or equipment directly on the IKO Permatec Waterproofing, we would recommend the use of minimum 18mm plywood as protection.

NB: The completed roof must not be used as a storage area)

4.0 Alterations

Additional units, penetration or fixings that may be required should be referred to IKO PLC or the original roofing contractor prior to any works being carried out.

4.1 Any approved additional waterproofing works must be carried out with the full knowledge of IKO PLC and ideally by the original Registered Contractor.

4.2 Any works to the roof must take account of the requirements of any horticultural or protective finishes, and provision made to remove, correctly store and reinstate drainage/filter layers, growing medium and plants, where applicable.

5.0 Routine Inspections

The roofs should be inspected twice yearly, preferably in the spring and autumn, and/or after extremes of weather conditions. Inspections should be carried out generally in accordance with BS 6229, with particular attention to the following items:

5.1 It is important to check that roof outlets are functioning and gratings are not blocked. Remove debris from the roof but do not flush silt or dead leaves down outlets. In areas where taller trees are adjacent to the roof, inspections may be required more frequently.

5.2 Note the general condition of any exposed Permatec waterproofing and report any damaged areas immediately.

5.3 Check waterproofing to any roof light kerbs. Check any rooflight domes for signs of damage or deflection.

5.4 Check perimeter details and upstands, ensuring that any metal cappings, flashings, edge trims and mortar pointing to chase details are secure.

5.5 Check flashings to any expansion joints and that cappings are secure.

5.6 Check upstand flashings to plant support legs/upstands.

5.7 Check upstands and flashings to pipe penetrations.

5.8 Examine all mastic seals and repair/replace as necessary.

5.9 Check walkways and around access points to ensure damage/displacement has not occurred to walkway or concrete paving.

6.0 Accidental Damage

In the event of accidental damage occurring to the waterproofing, the installing contractor and/or IKO PLC should be notified immediately in order that a practical solution to the problem can be agreed and any remedial actions taken. Failure to make contact with IKO and/or the contractor could invalidate any guarantee offered.

7.0 Roof Repairs

Permatec Roofs which are under guarantee by IKO PLC should only be repaired by the installing contractor, with full design reference to IKO Technical Services Department.

See guidance notes on the guarantee document.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July 2019