



**NSAI**  
Agrément

**IRISH AGREMENT BOARD  
CERTIFICATE NO. 23/0440**

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## **PERMATEC ECOWRAP HOT MELT ROOF WATERPROOFING SYSTEM**

**NSAI Agrément (Irish Agrément Board)** is designated by Government to carry out European Technical Assessments.

NSAI Agrément Certificates establish proof that the certified products are 'proper materials' suitable for their intended use under Irish site conditions, in accordance with TGD Part D of the second schedule of the Building Regulations 1997 to 2023.

### **PRODUCT DESCRIPTION**

This Agrément Certificate relates to the Permateg EcoWrap Hot Melt Waterproofing System. The system is based on a formulated waterproofing membrane made from a combination of refined bitumen, synthetic rubbers and other additives. The membrane is applied in two layers to provide a waterproofing layer with a nominal coating thickness of 6 mm. The system is used in conjunction with a reinforcement layer and a protection layer.

In the opinion of NSAI, the IKO Permateg EcoWrap hot melt waterproofing system as described in this Certificate, complies with the requirements of the Building Regulations 1997 to 2023.

### **USE**

The Permateg EcoWrap Hot Melt Waterproofing System is suitable for use as a waterproofing layer in protected flat roofs, zero fall roofs, inverted roofs and blue roof specifications in combination with a storm water attenuation system<sup>(1)</sup>.

The System can also be used with an anti-root additive for use as a waterproofing layer in green roof specifications in combination with a storm water attenuation system<sup>(1)</sup>. See detail sheet 1 appended to this Certificate for details specific to green roof specifications.

<sup>(1)</sup>The storm water attenuation system is outside the scope of this certificate.

The product is manufactured by:

IKO PLC  
Prospect Quarry,  
Grangemill,  
Matlock,  
DE4 4BW,  
United Kingdom

In Ireland, the product distribution, technical support and sales are performed by:

IKO Ltd.  
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### **MANUFACTURE AND MARKETING**

**Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting NSAI Agrément, NSAI, Santry, Dublin 9 or online at [www.nsai.ie](http://www.nsai.ie)**

## 1.1 ASSESSMENT

In the opinion of NSAI Agrément, the Permateg EcoWrap Hot Melt Waterproofing System, if installed, used and maintained in accordance with this Certificate, can meet or contribute to meeting the requirements of the Irish Building Regulations as indicated in Clause 1.2 of this Agrément Certificate.

## 1.2 BUILDING REGULATIONS

### REQUIREMENT:

#### **Part B Volume 1 – Fire Safety B4 – External Fire Spread**

When used in accordance with this certificate, the Permateg Hot Melt Waterproofing System can meet the relevant requirements of TGD Part B4 using suitable finishing layers. See section 4.1 for further information.

#### **Part B Volume 2 – Fire Safety B9 – External Fire Spread**

When used in accordance with this certificate, the Permateg Hot Melt Waterproofing System can meet the relevant requirements of TGD Part B4 using suitable finishing layers. See section 4.1 for further information.

#### **Part C – Site Preparation and Resistance to Moisture**

##### **C4 – Resistance to Weather and Ground Moisture**

The Permateg Hot Melt Waterproofing System can meet the relevant requirements of TGD Part C4, when installed in accordance with this Certificate.

#### **Part D - Materials and Workmanship**

##### **D1 - Materials and workmanship**

The Permateg Hot Melt Waterproofing System used in accordance with this NSAI Agrément Certificate can meet the requirements of TGD Part D1.

**D3** – The Permateg Hot Melt Waterproofing System, as certified in this NSAI Agrément Certificate, is manufactured from materials which are 'proper materials' fit for their intended use.

## 2.1 PRODUCT DESCRIPTION

The Permateg EcoWrap Hot Melt Waterproofing System consists of a hot applied membrane made from a combination of refined bitumen, synthetic rubbers, fillers and other additives. The material is melted at the installation location in a purpose-built machine and is applied to a prepared structural deck in two nominal 3mm coats. The membrane is reinforced with a polyester reinforcing scrim, providing a monolithic waterproofing system with a nominal coating thickness of 6mm. The system is protected using a suitable protection layer to achieve the necessary resistance to mechanical damage, resistance to solar UV rays, solar heat gain and combustibility rating required for a project.

## 2.2 ANCILLARY ITEMS

The membrane is used in conjunction with a range of reinforcement membranes, protection membranes and boards depending on a project specific design. The following products have been assessed for use with the system:

- PermaFLASH-R — a 55 g/m<sup>2</sup> polyester reinforcing scrim
- PermaFLASH-D150 — a 1.25mm thick and 150mm wide flexible detailing sheet, used as a reinforcement layer over cracks, construction joints and changes in materials, and where minor movement may occur
- PermaFLASH-D500 — a 1.25mm thick and 500mm wide flexible detailing sheet, used as a reinforcement at rainwater outlets
- PermaGUARD-F — a 180g/m<sup>2</sup> sand-surfaced, polyester-based bitumen membrane protection layer
- PermaGUARD-M — a 180g/m<sup>2</sup> slate-surfaced, high-performance torch-applied bitumen membrane protection layer for use on details which will not be covered by the surface finishes
- PermaGUARD-HDPB — a 3mm thick high-density polymeric protection board
- PermaGUARD-PB — a 3.2mm thick protection board fabricated with a bituminous core sandwiched between two layers of non-woven glass fibre reinforcement
- IKO Permateg High Penetration Primer — a brush or roller-applied bituminous priming solution used in the preparation of cementitious surfaces prior to the application of the membrane.
- IKO Permateg Polymer Primer — a brush- or roller-applied synthetic rubber-based

priming solution used in the preparation of cementitious surfaces prior to the application of the membrane.

Other products which may be used with the system but are outside the scope of this certificate include:

- Foamglass insulation - cellular glass insulation slabs with a minimum compressive strength of 400kpa
- IKO Plasdrain — a range of drainage boards
- Inverted Roof Insulation Board — insulation used in inverted/protected roof specifications
- Upstand Insulation Board — insulation with a weather-resistant facing board, used for upstand detailing
- Proprietary expansion joint systems
- PermaFLASH-UN — a 1.5 mm thick and 300 mm wide un-cured neoprene rubber reinforcement sheet used at construction joints and where minor structural movement is anticipated.

## 2.3 MANUFACTURE

The Permateg EcoWrap compound is manufactured by heating and blending bitumen, process oils, fillers and other additives in a temperature-controlled cycle. Protection membranes are manufactured by traditional continuous coating processes, and other components of the system are purchased to agreed specifications.

## 2.4 QUALITY CONTROL

The NSAI has assessed and agreed the following with respect to the quality control of the waterproofing membrane:

- The quality control procedures and product testing to be undertaken have been agreed, documented, and implemented within the company quality management system. The management system of IKO PLC has been assessed and registered as meeting the requirements of EN ISO 9001 : 2015 by BSI, EN ISO 14001 : 2015 by Lucideon and BES 6001 : Issue 3.1 by Lucideon.
- The quality control procedures implemented for batches of incoming materials have been assessed and agreed.
- The production process has been audited and verified that it is in accordance with the documented process.

- The investigative procedures and management of non-conformities has been evaluated for effectiveness.
- Agreed to verify the above measures on a regular basis through a surveillance process.

## 2.5 DELIVERY, STORAGE AND MARKING

The Permateg EcoWrap compound is moulded into 12kg blocks and encased in an EcoWrap heat-dispersible film. The encased blocks are stacked on a pallet and shrink wrapped for transport. Each pallet receives a pallet label which contains the following information:

- Product Name
- Product Code
- Pallet weight and Quantity of Blocks
- Manufacturing Order Number
- Recommended Laying Temperature
- Maximum Temperature
- Storage Information
- NSAI Agrément identification mark incorporating the number of this Certificate

Reinforcing and protection layers are packaged with labels bearing the product trade name and should be stored under cover and kept dry.

IKO Permateg High Penetration Primer and IKO Permateg Polymer Primer are delivered to site in 25 litre cans. The Certificate Holder has taken the responsibility of classifying and labelling the system components under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

## 2.6 INSTALLATION

### 2.6.1 APPROVED INSTALLERS

All installation work must be carried out in accordance with the manufacturer's installation instructions by trained and licensed IKO roofing contractors, records of whom are kept on the Certificate Holder's database. Installation details are available in the IKO PermaTec System Installation Guide.

### 2.6.2 ASSESSMENT OF SUBSTRATE SUITABILITY

It must be ensured that the structure is sound and designed to accept the dead and imposed loading of the waterproofing system and associated installation procedures. The substrates must comply with the relevant requirements of BS 6229. The substrate must be dry and clean of all surface contaminants, such as curing compounds, formwork release agents, oils, dirt etc. Any surface irregularities likely to inhibit IKO Permateg from being applied as a continuous monolithic membrane should be removed, replaced or properly repaired. To assess the suitability of a substrate to receive the membrane, bond tests must be carried out by approved installers to

ensure that adequate adhesion can be achieved between the substrate and the membrane. If bonding problems occur, advice must be sought from the Certificate Holder.

The moisture content of cementitious substrates is critical to achieving adequate bond strength.

Substrates must be free of defects before any work commences such as cracks, surface level irregularities, raised float marks or protruding aggregate and any other areas of potential weakness. These areas must be repaired, and the substrate cleaned in accordance with the Certificate Holder's instructions. Laitance, dusting and curing materials will need to be removed in order for the IKO Permateg to achieve a suitable bond.

Sand and cement screeds are not suitable to receive IKO Permateg and should be avoided. Bond tests have shown satisfactory adhesion to the following substrates:

- In-situ structural concrete deck
- Pre-cast concrete deck
- Plywood
- Metal deck with cement particle board
- Metal deck with plywood board
- IKO Approved Modified Screeds

### 2.6.3 CEMENTITIOUS SUBSTRATE PREPARATION

Cementitious substrates must be conditioned with IKO Permateg High Penetration Primer or IKO Permateg Polymer Primer in accordance with the Certificate Holder's instructions and allowed to dry before application of the membrane.

### 2.6.4 INSTALLATION PROCEDURE

The Permateg EcoWrap Hot Melt Roofing System must be installed in accordance with the Certificate Holder's instructions and this Certificate.

Blocks of the membrane compound are heated at the installation location in a purpose-built machine with a mechanically agitated melter. The machine must have a double jacket containing either air or a heat-transfer mineral oil and be fitted with thermometers to measure the melt and air/oil temperatures. The nominal temperature range for the molten membrane is 160°C to 180°C. The temperature of the melt must not exceed 190°C.

The molten membrane is discharged from the melter into a suitable container and applied to the roof, using a long-handled squeegee for horizontal surfaces and a suitable spreader for vertical upstands. The substrate must be dry and frost free.

At all non-monolithic changes in substrate materials, at structural/shrinkage cracks between 3 and 6 mm wide, at structural joints between 6 and 12 mm wide and where minor movement may occur, a reinforcement layer of PermaFLASH-D150 should be applied prior to applying the Permatec EcoWrap membrane.

At structural movement joints between 12mm and 50 mm, a proprietary joint system must be installed. The Certificate Holder should be consulted for suitable products.

At all board joints in plywood, calcium silicate and composite metal decks, a reinforcement layer of PermaFLASH-D150 or a minimum 150 mm wide strip of PermaFLASH-R must be applied prior to applying the Permatec EcoWrap membrane. The advice of the certificate Holder should be sought. Detailing must be formed in accordance with the Certificate Holder's instructions.

The first layer of the molten Permatec EcoWrap membrane should have a nominal thickness of 3 mm. PermaFLASH-R polyester reinforcing scrim is embedded by lightly brushing it into the first layer of the membrane whilst it is still hot and tacky. The reinforcement overlaps must be at least 75 mm and fully sealed by Permatec EcoWrap membrane. The second layer of Permatec EcoWrap membrane, applied over the top of the reinforcement, should have a nominal thickness of 3 mm.

The membrane is covered by a protective layer immediately after installation, in accordance with the Certificate Holder's instructions. The system will accept the limited foot traffic and loads associated with installation, but adequate protection should be afforded to the newly installed Permatec against damage caused by following trades.

#### **2.6.5 MAINTENANCE**

Adequate provision should be made in the initial design phase for access and maintenance over the life of the system. The system must be inspected at six monthly intervals in accordance with BS 6229, Chapter 7. Maintenance should

include checks and operations to ensure that the system and drainage outlets are free from the build-up of silt and other debris, and that protection layers, e.g., walkways, are in good condition. In the event of the system being contaminated by oil, grease or other chemicals, the advice of the Certificate Holder must be sought. Damage to the system must be repaired as soon as possible.

#### **2.6.6 REPAIR**

Any damage to the system must be repaired as soon as possible to ensure that the integrity of the waterproofing is maintained. The advice of the Certificate Holder should be sought in all cases. Should a leak occur in the roof waterproofing, it must be repaired following removal of the upper layers of the system. Correct reinstatement of these layers must be carried out with particular care and the advice of the Certificate Holder should be sought. Where maintenance or repair of any of the roof components above the waterproofing system is necessary, care must be taken to avoid damage to the membrane. In the event that the system is contaminated by chemicals, oils and greases, the advice of the Certificate Holder should be sought.

#### **2.6.7 ENVIRONMENTAL INFORMATION**

The Permatec waterproofing membrane compound has a recycled content of 45% by mass of the total product. The recycled materials are described as limestone filler and ground rubber crumb, the latter manufactured from post-consumer vehicular tyres. Post-consumer material is defined in I.S. EN ISO 14021: 2016, and the Waste & Resources Action Programme (WRAP) 'Rules of Thumb' Guide to Recycled Content in Construction Products. The recycled content has been calculated in accordance with I.S. EN ISO 14021 : 2016 by expressing the input mass of recycled material as a percentage of the total input mass for the product.

#### **2.6.8 GREEN ROOF SPECIFICATIONS**

See Detail Sheet 1 appended to this Certificate.

### 3.0 GENERAL

**3.1** The Permateg EcoWrap Hot Melt Waterproofing System is satisfactory for use as a waterproofing layer on flat roofs (including zero fall) with limited access in:

- inverted roof specifications
- protected roof specifications
- podium decks and walkways for pedestrian access
- blue roofs in combination with a storm water attenuation system.

**3.2** The system is suitable for use on in-situ concrete, precast concrete, concrete block, timber substrates, Foamglass insulation (with a minimum compressive strength of 400kpa), modified screeds and levelling compounds. The substrates must comply with the relevant requirements of BS 6229.

**3.3** Blue roofs are defined for the purpose of this Certificate as zero fall roofs designed to allow controlled attenuation of rainfall during heavy storm events, as part of Sustainable Urban Drainage Systems (SuDS). Reference should be made to the appropriate clauses of the NFRC Technical Guidance Note for the construction and design of Blue Roofs.

**3.4** Pedestrian access roofs are defined for the purpose of this Certificate as those not subject to vehicular traffic.

**3.5** Limited access roofs are defined for the purpose of this Certificate as those subjected to pedestrian traffic only for maintenance of the roof covering, cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the membrane must be provided.

**3.6** Flat roofs are defined for the purpose of this Certificate as those having a weathered surface at no more than ten degrees ( $10^\circ$ ) to the horizontal.

**3.7** Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 1:80. Reference should also be made to appropriate Mastic Asphalt Council Association guidance documents.

**3.8** Structural decks to which the system is to be applied must comply with the relevant requirements of BS 6229 and must be suitable to transmit the dead and imposed loads experienced in service.

**3.9** Imposed loads, dead loading and wind loads are calculated in accordance with IS EN 1991-1-1,

IS EN 1991-1-3 and IS EN 1991-1-4, and their Irish National Annexes.

**3.10** The drainage systems for inverted, protected zero fall and blue roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective
- the attenuation system and drainage for blue roofs should be designed by a suitably competent and experienced individual to allow the short-term storage and discharge at a set flow rate of storm water to alleviate the risk of localised flooding.

**3.11** Insulation materials used in conjunction with the system must be suitable for use within inverted roofs in accordance with the Certificate Holder's instructions.

**3.12** The system can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway should be provided.

**3.13** Contact with oil-based products must be avoided as the system may not be compatible with these types of products. If contact with such products the advice of the Certificate holder must be sought.

**3.14** Wind loads should be assessed in accordance with I.S. EN 1991-1-4:2005 + A1:2010 and the Irish National Annex on a project specific basis, taking due consideration of the roof build-up for the project such as; any added surfacing such as green roofs, paving slabs, gravel, blue roof water retention, etc. The resistance to wind uplift of the waterproof covering and finishes on a flat roof should be assessed having regard to the dead weight of those materials and to the nature, type, and disposition of their attachment to the slab or deck, in accordance with BS 8217 and IS EN 16002.

**3.15** On blue roof specifications, it may be necessary to increase the normal level of protection to avoid flotation and care should be taken to ensure that the roof structure can withstand this extra loading in addition to the

retained rainwater. Where the insulation is secured by ballast, the minimum aggregate size should be sufficient to prevent wind scour.

**3.16** The system can accept, without damage, the thermal movement likely to occur in practice and the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Where access exceeding this is envisaged, this should be taken into account when determining the surface protection. Reasonable care is required to avoid prolonged point loading by heavy and/or sharp objects.

**3.17** Calculations of the thermal transmittance (U-value) of specific roof build-ups should be carried out in accordance with IS EN ISO 6946 using thermal conductivity ( $\lambda$ ) values of the products used as defined by the certificate holder. The U-value of a construction will depend on the materials used and the design. For retrofit installations on existing dwellings guidance should be sought from the certificate holder on achievable U-values as the actual U-value of installation will depend on the construction of the existing building elements. Guidance in this respect, and on limiting heat loss by air infiltration, shall be sought from the certificate holder and by reference to the DoEHLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details.

**3.18** The internal condensation risk of the roof must be assessed in accordance with BS 6229 and BS 5250. An approved vapour barrier (AVCL) is required on the warm side of the insulation in all instances.

**3.19** The risk of interstitial condensation in the roof build-up is dependent on several factors including roof design. Reference should be made to BS 6229 and BS 5250. To avoid the risk of interstitial condensation in cold flat roofs, an AVCL should be provided on the warm side of the insulation and there should be a cross ventilated void, not less than 50mm deep, between the slab or deck and the insulation. Ventilation openings shall be provided to every roof void along two opposite sides of the roof. The risk of interstitial condensation in warm flat roofs is dependent on the nature of the supporting structure. As there is a risk of interstitial condensation forming between the thermal insulation and the waterproofing covering, an AVCL with a vapour resistance at least equal to that of the waterproofing covering should be installed immediately above the supporting structure, wrapped and sealed at the perimeter and at all penetrations through the roof covering. For inverted flat roofs, it is essential that the thermal insulation used resists water absorption and is sufficiently loadbearing to support the protective covering or ballast where used. When building elements do not follow the principles of BS 5250, a robust hygrothermal assessment to either I.S. EN 15026 or I.S. EN ISO

13788 must be considered. Care should be taken to provide adequate ventilation, particularly in rooms expected to experience high humidity, and to ensure the integrity of vapour control layers and linings against vapour ingress.

**3.20** For retrofit installation, when improving the thermal performance of the external envelope of an existing building, through to upgrading of roof insulation as part of a roof build-up, designers need to consider the impact of these improvements on other untouched elements of the building. When bridged junctions meet the requirements of TGD Part L, Appendix D - table D1, the coldest internal surface temperature will satisfy the requirements of section D2, namely that the temperature factor ( $f_{Rsi}$ ) shall be equal to or greater than 0.75. As a result, best practice will have been adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth. When site limiting factors give rise to substandard level of insulation at bridged junctions, guidance should be sought from the certificate holder as to acceptable minimum requirements. When insulating buildings, the recommendations of BS 5250 should be followed to minimise the risk of condensation within the building elements and structures. Roofs will adequately limit the risk of surface condensation where the thermal transmittance (U-value) does not exceed 0.35 W/m<sup>2</sup> K at any point, and openings and junctions with other elements are designed in accordance with the DoEHLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details (ACD).

**3.21** The linear thermal transmittance  $\psi$  (Psi) describes the heat loss associated with junctions and around openings. When all building junctions are shown to be equivalent or better than those detailed in the DoEHLG Acceptable Construction Details, then it is acceptable to use the linear thermal transmittance values outline in Table D1 of Appendix D of TGD to Part L of the Building Regulations. When all bridged junctions within a building comply with the requirements of Table D1 of appendix D of TGD to Part L, the improved 'y' factor of 0.08 can be entered into the Dwelling Energy Assessment Procedure (DEAP) Building Energy Rating (BER) calculation. Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded for that project for use in future BER calculations.  $\Psi$ -values for other junctions outside the scope of this certificate should be assessed in accordance with the BRE IP1/06 "Assessing the effects of thermal bridging at junctions and around openings" and BRE Report BR 497 in accordance with appendix D of TGD to Part L of the Building Regulations.

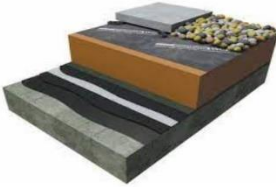


**3.22** Adequate room and roof ventilation must be provided in accordance with TGD Part F of the



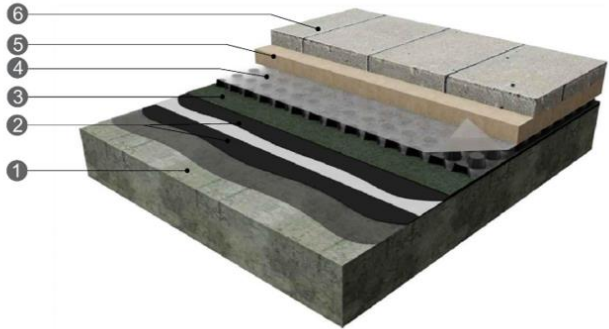
Building Regulations for all installations. This will also limit the potential for Interstitial Condensation and Internal Surface condensation as detailed in Cl. 3.18 of this certificate. In addition, a cross-ventilation shall be provided in cold flat roof designs as detailed in Cl. 3.19 of this certificate.



### 3.23 Typical Design Specifications

<b>Table 3: Typical Roof Build-ups 1/</b>			
	<b>- New Build - Concrete</b>	<b>-New build -Metal deck with Cement Particle Board or Plywood Deck</b>	<b>- New Build - Concrete - Green Roof</b>
<b>Build-up</b>			
<b>Substrate Preparation</b>	Permatec Polymer Primer	PermaFlash D150 to joints + Permatec Polymer Primer	Permatec Polymer Primer
<b>Change of Substrate</b>	PermaFlash D150 bonded in Permatec Ecowrap	PermaFlash D150 bonded in Permatec Ecowrap	PermaFlash D150 bonded in Permatec Ecowrap
<b>Outlet Detailing</b>	PermaFlash D500 bonded in Permatec Ecowrap	PermaFlash D500 bonded in Permatec Ecowrap	PermaFlash D500 bonded in Permatec Ecowrap
<b>Expansion Joints</b>	PermaFlash UN	PermaFlash UN	PermaFlash UN
<b>Waterproofing Options</b>	Permatec Ecowrap	Permatec Ecowrap	Permatec Ecowrap Anti-Root or Permatec Ecowrap with Roofgarden 4APP AD/F
<b>Reinforcement</b>	PermaFlash R	PermaFlash R	PermaFlash R
<b>Protection Layer – Field Area</b>	PermaGuard F	PermaGuard F	PermaGuard F
<b>Other Optional Protection Boards</b>	PermaGuard PB or PermaGuard HDPB	PermaGuard PB or PermaGuard HDPB	PermaGuard PB or PermaGuard HDPB
<b>Protection Layer – Vertical Upstands</b>	PermaGuard M	PermaGuard M	PermaGuard M
<b>Insulation Type</b>	XPS Insulation	XPS Insulation	XPS Insulation
<b>Fastening</b>	Loose Laid – Ship Lapped	Loose Laid – Ship Lapped	Loose Laid – Ship Lapped
<b>Types of Roof Finishes</b>	Stone Ballast Paving Flags Blue Roof	Stone Ballast Paving Flags Blue Roof	Stone Ballast Paving Flags Green Roof Brown Roof Blue Roof

### 3.23 Typical Design Specifications (continued)

	<b>Layer No.</b>	<b>Build-up Description</b>
	1	Concrete Deck primed with PermaTec Primer
	2	2 Coats of Permatec Anti-Root Incorporating Permaflash-R Reinforcement
	3	Permaguard-F Protection Layer
	4	Drainage/Moisture Retention Layer
	5	Sand/Cement Screed
	6	Brick paviments/Concrete Paving Slabs

#### **4.1 BEHAVIOUR IN FIRE**

The system requires a suitable protection layer to achieve the necessary combustibility rating applicable to each project. Tests were conducted to EN 13501-5:2016 using an accredited laboratory on samples to determine the combustibility of the system incorporating various protection layers. Fire test reports for various design specifications are available from the Certificate Holder. Fire tests assessed demonstrate that the system can achieve a  $B_{\text{roof}}(t_4)$  rating.

#### **4.2 LIQUID WATER PENETRATION**

Test data obtained by NSAI Agrément confirms that the system is watertight when installed in accordance with this certificate and the Certificate Holder's instructions.

#### **4.3 RESISTANCE TO MECHANICAL DAMAGE**

The systems can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway should be provided. The system is capable of accepting minor structural movement while remaining weathertight.

#### **4.4 PERMATEC ECOWRAP CHARACTERISATION**

Characterisation test data obtained by NSAI Agrément was reviewed to establish fines, penetration, flow and resilience of the Permamatec EcoWrap compound.

#### **4.5 PERMAFLASH-R AND PERMAFLASH-D CHARACTERISATION**

Characterisation test data obtained by NSAI Agrément was reviewed to establish thickness, mass per unit area and tensile properties of the PermaFlash-R and Permaflash-D membranes.

#### **4.6 WATER VAPOUR PERMEABILITY**

Test data was obtained by NSAI Agrément on samples of the system and/or system components, and the results assessed to determine water vapour permeability.

#### **4.7 LOW TEMPERATURE FLEXIBILITY**

Test data was obtained by NSAI Agrément on samples of the system and/or system components, and the results assessed to determine Low Temperature Flexibility.

#### **4.8 RESISTANCE TO FATIGUE**

Test data obtained by NSAI Agrément on samples of the system and/or system components, and the results assessed to determine resistance to fatigue.

#### **4.9 RESISTANCE TO DYNAMIC INDENTATION**

Test data was obtained by NSAI Agrément on samples of the system incorporating Permagaard-PB protection, and the results assessed to determine resistance to dynamic indentation.

#### **4.10 RESISTANCE TO STATIC INDENTATION**

Test data was obtained by NSAI Agrément on samples of the system incorporating Permagaard-PB protection, and the results assessed to determine resistance to static indentation.

#### **4.11 EFFECT OF HEAT AGING**

Test data was obtained by NSAI Agrément on samples of the system and/or system components, and the results assessed to determine the effect of heat aging.

#### **4.12 EFFECT OF EXPOSURE TO SURFACE WATER**

Test data was obtained by NSAI Agrément on samples of the system and/or system components, and the results assessed to determine the effect of exposure to surface water.

#### **4.13 DURABILITY**

The assessment indicates that the system is capable of lasting 35 years providing it is designed, installed and maintained in accordance with this Certificate. Any damage to the surface finish must be repaired immediately and regular inspections and maintenance shall be undertaken as outlined in Section 2.6.5 of this Certificate.

#### **4.14 MANUFACTURING PROCESS**

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used to formulate the Permamatec EcoWrap Hot Melt compound.

#### **4.15 INSTALLATION**

Site visits were conducted to assess the practicability of installation in accordance with the installation manuals and training provided by the certificate holder.

**5.0 CONDITIONS OF CERTIFICATION**

**5.1** National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of last revision date so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI Agrément are paid.

**5.2** The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate Holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

**5.3** In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate Holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate Holder in accordance with the descriptions and specifications set out in this Certificate.

**5.4** This Certificate does not comprise installation instructions and does not replace the

manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

**5.5** Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However, the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005<sup>Error! Reference source not found.</sup>, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate Holder.

**5.6** The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

**5.7** Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

## **Bibliography**

- [1] I.S. EN ISO 9001 : 2015 Quality management systems — Requirements
- [2] I.S. EN ISO 14001 : 2015 Environmental management systems — Requirements with guidance for use
- [3] BES 6001 : Issue 3.1 Framework Standard for Responsible Sourcing
- [4] CLP Regulation (EC) No 1272/2008 - Regulation (EC) No 1272/2008 - classification, labelling and packaging of substances and mixtures (CLP)
- [5] BS 6229 : 2018 Flat roofs with continuously supported coverings — Code of practice
- [6] I.S. EN ISO 14021 : 2016 Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)
- [7] I.S. EN 1991-1-1 : 2002 Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings.
- [8] NA to I.S. EN 1991-1-1 : National Annex to Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings.
- [9] I.S. EN 1991-1-3 : 2003 + A1 : 2015 Eurocode 1 — Actions on structures — General actions — Snow loads
- [10] NA to I.S. EN 1991-1-3 : 2003 + A1 : 2015 National Annex to Eurocode 1 : Actions on structures — General actions — Snow loads
- [11] I.S. EN 1991-1-4 : 2005 + A1 : 2010 Eurocode 1 : Actions on structures — General actions — Wind actions
- [12] NA to I.S. EN 1991-1-4 : 2005 National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions
- [13] BS 8217:2005 Reinforced bitumen membranes for roofing - Code of practice
- [14] EN 16002:2018 - Flexible sheets for waterproofing - Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing.
- [15] BS 5250: 2021 Management of moisture in buildings – Code of practice
- [16] IS EN 15026:2023 - Hygrothermal performance of building components and building elements. Assessment of moisture transfer by numerical simulation
- [17] I.S. EN 13501-5:2016 - Fire Classification Of Construction Products And Building Elements - Part 5: Classification Using Data From External Fire Exposure To Roofs Tests

## NSAI Agrément

This Certificate No. **23/0440** is accordingly granted by the NSAI to **IKO Ltd** on behalf of NSAI Agrément.

**Date of Issue: 13<sup>th</sup> December 2023**

**Signed**



**Kevin D. Mullaney**  
**Director of Certification, NSAI**

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. [www.nsai.ie](http://www.nsai.ie)

**D.1.1 PRODUCT DESCRIPTION**

This Product Detail Sheet relates to the use of the Permatec Green Roof Waterproofing System, for use as a waterproofing layer in flat roofs (including zero fall), green roofs, biodiverse roofs and roof gardens. The formulation for the Permatec Anti-Root Hot Melt Waterproofing System includes an additional anti-root inhibitor additive. Alternatively, an anti-root membrane can be incorporated into the build-up to inhibit root penetration.

**D.1.2 USE**

The membranes and ancillary items in this detail sheet are for use with green roof specifications. These consist of:

- Permatec EcoWrap membrane incorporating PermaFLASH-R reinforcement finished with a layer of IKO Roofgarden 4APP AD/F 7.5 m
- Permatec Anti-Root membrane incorporating PermaFLASH-R reinforcement finished with a layer of PermaGUARD F.

**D.1.3 MANUFACTURE AND MARKETING**

See section 1 of this Agrément Certificate for information regarding the manufacture and marketing of these compounds.

**D.1.4 ANCILLARY ITEMS**

The membranes are used in conjunction with a range of reinforcement membranes, protection membranes and boards depending on a project specific design. A list of system components compatible with the system is given in section 2.2 of this certificate.

Products which may be used with the system, but which are outside the scope of this Certificate are listed in section 2.2 of this certificate. Additionally, for green roof specifications, the following products may be used with the system, but are outside the scope of this Certificate:

- IKOgreen Vegetation — for use in roof garden applications
- IKOgreen Growing Medium — for use in roof garden applications
- IKOgreen Plasfeed — a range of drainage/moisture retention layers for use in roof gardens applications

**D.1.5 MANUFACTURE & QUALITY CONTROL**

The manufacturing processes and quality control applied to the system are described in sections 2.3 and 2.4 of this certificate.

**D.1.6 DELIVERY, SITE HANDLING AND MARKING**

The delivery, site handling and marking applicable to this system is detailed in section 2.4 of this certificate.

**D.1.7 ENVIRONMENTAL INFORMATION**

The environmental information provided in section 2.6.8 of this certificate is applicable to the green roof waterproofing system.

**D.1.8 MAINTENANCE**

Green roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure unwanted vegetation and other debris are cleared from the roof and drainage outlets. Guidance is available within the latest edition of The GRO Green Roof Code – Green Roof Code of Best Practice for the UK. Should a leak occur in the roof waterproofing, it must be repaired following removal of the upper layers of the system. Correct reinstatement of these layers must be carried out with particular care and the advice of the Certificate Holder should be sought.

**D.1.9 DURABILITY**

See section 4.13 of this certificate for durability information.

**D.1.10 REPAIR**

See section 2.6.6 of this certificate for repair information.


**D.1.11 DESIGN DATA**

See section 3 of this certificate for design data relevant to the use of the Permatec waterproofing systems.

In addition, for green roof specifications, recommendations for the design of green roof and roof garden specifications are available within the latest edition of The GRO Green Roof Code – Green Roof Code of Best Practice.

Dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer. The system requires a suitable protection layer to achieve the necessary combustibility rating applicable to each project. Fire test reports for various design specifications are available from the Certificate Holder. For green roof specifications, plants used may allow flame spread across the roof. This should be taken into consideration when selecting suitable plants for the roof. Appropriate planting irrigation and/or protection should be applied to ensure the overall fire-rating of the roof is not compromised.

**D.1.12 TYPICAL GREEN ROOF DESIGN SPECIFICATION**



Layer No.	Build-up Description	Alternative Build-up
1	Concrete Deck primed with PermaTec Primer	Concrete Deck primed with PermaTec Primer
2	2 Coats of Permateg Anti-Root Incorporating Permaflash-R Reinforcement	Permateg EcoWrap membrane incorporating PermaFLASH-R reinforcement
3	Permaguard-F Protection Layer	IKO Roofgarden 4APP AD/F 7.5 m
4	Inverted Roof Insulation	Inverted Roof Insulation
5	Water Control Layer	Water Control Layer
6	Drainage/Moisture Retention Layer	Drainage/Moisture Retention Layer
7	Broken Rubble/Brick	Broken Rubble/Brick
8	Biodiverse Growing Medium	Biodiverse Growing Medium
9	Wildflower Seed Mix	Wildflower Seed Mix

**D.1.13 INSTALLATION**

The installation procedures applicable are detailed in section 2.6 of this certificate. Soil or other bulk material should not be stored on one area of the roof prior to installation, to ensure that localised overloading does not occur. The membrane must be protected immediately with the specified PermaGUARD or IKO Roofgarden 4APP/F 7.5 m protection layer. This is carried out prior to applying the insulation, water control layer and the protective layer or other specified surface finish.

**D.1.14 TECHNICAL INVESTIGATIONS**

Section 4 of this Agrément Certificate details the tests, investigations and assessments conducted on the system. In addition, root resistance testing was evaluated as part of the green roof waterproofing system assessment. Tests on IKO Roofgarden 4APP AD/F 7.5m indicate that it is suitable for use as a root-resistant membrane and, when used with the systems in roof garden applications, will provide adequate protection from penetration by roots. The Permateg Anti-Root system will provide adequate protection from penetration by roots.