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Agrément Certificate
92/2792
Product Sheet 1

IKO PLC MASTIC ASPHALT PARKING DECK SYSTEMS

IKO PERMAPARK

This Agrément Certificate Product Sheet(1) relates to IKO Permapark, modified bitumen asphalt waterproofing and paving for use on concrete trafficked decks.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Weathertightness — the system will resist the passage of moisture into the building (see section 6).

Properties in relation to fire —the designation of completed roof specifications should be confirmed by reference to the requirements of the national Building Regulations (see section 7).

Resistance to wind uplift — when used in roof constructions, the system will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to mechanical damage — the system will accept, without damage, the traffic loads and the effects of thermal or other minor movement likely to occur in practice (see section 9).

Durability — under normal service conditions, the system will provide a durable waterproof surfacing with a service life of at least 25 years (see section 11).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Fourth issue: 28 October 2019

Originally certificated on 9 July 1992

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Regulations

In the opinion of the BBA, IKO Permapark, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement: **B4(2)** **External fire spread**
Comment: In Wales, the system can contribute to satisfying this Requirement. In England, testing will be required to determine the fire performance of the system. See sections 7.1 and 7.2 (Wales only) and 7.3 of this Certificate.

Requirement: **C2(b)** **Resistance to moisture**
Comment: The system will enable a roof structure to satisfy this Requirement. See section 6.1 of this Certificate.

Regulation: **7** **Materials and workmanship (applicable to Wales only)**
Regulation: **7(1)** **Materials and workmanship (applicable to England only)**
Comment: The system is acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation: **8(1)(2)** **Durability, workmanship and fitness of materials**
Comment: The use of the system satisfies the requirements of this Regulation. See sections 10 and 11 and the *Installation* part of this Certificate.

Regulation: **9** **Building standards applicable to construction**
Standard: 2.8 Spread from neighbouring buildings
Comment: Testing will be required to determine the vulnerability of a roof including the system, with reference to clause 2.8.1(1)(2) of this Standard. See section 7.3 of this Certificate.

Standard: 3.10 Precipitation
Comment: The system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1(1)(2) and 3.10.7(1)(2). See section 6.1 of this Certificate.

Standard: 7.1(a) Statement of sustainability
Comment: The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.

Regulation: **12** **Building standards applicable to conversions**
Comment: All comments given for the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: **23(a)(b)(i)** **Fitness of materials and workmanship**
Comment: The system is acceptable. See section 11 and the *Installation* part of this Certificate.

Regulation: **28(b)** **Resistance to moisture and weather**
Comment: The system will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.

Regulation:	**36(b)**	**External fire spread**
Comment:		The system can contribute to satisfying this Regulation. See sections 7.1 and 7.2 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.1 and 3.2) and the *Installation* part of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking IKO Pemapark paving in accordance with harmonised European Standard EN 13108-6 : 2016. The manufacturer should be consulted for the relevant documentation relating to the CE marking.

Technical Specification

1 Description

1.1 IKO Permapark is a polymer-modified asphalt waterproofing and paving system for concrete car park decks and HGV service decks. The system comprises a waterproofing layer of asphaltic cement with fine and coarse limestone aggregate, and a paving layer incorporating 6 or 10 mm coarse aggregate.

1.2 Other items or components which may be used with the system(1) but which are outside the scope of this Certificate, are:

- glass fibre tissue separating membrane — for isolating the waterproofing layer from the in-situ or precast screeded concrete base
- high-bond primer — for application to upstands and tamped concrete ramps to provide a key for the waterproofing layer
- high-density extruded polystyrene — for use in Insulated IKO Permapark Specifications PA4 and PA6, where thermal insulation is required above the structural slab
- minimum grade 20 Lytag/sand concrete — for use with Type A142 steel wire mesh reinforcement to provide protection to the extruded polystyrene in insulated systems.

(1) Details of suitable products/specifications may be obtained from the Certificate holder.

2 Manufacture

2.1 IKO Permapark waterproofing and paving asphalts are manufactured by mixing asphaltic cement and limestone fine and coarse aggregate using conventional mixing techniques. The asphaltic cement consists of a polymer-modified bitumen.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of IKO PLC has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI Management Systems (Certificate FM595512).

3 Delivery and site handling

3.1 The system components are supplied in hot charge (molten) form, delivered to site in purpose-built transporters. The component information is supplied on the relevant delivery notes with each consignment.

3.2 Alternatively, the system components may be supplied in block form (similar to traditional grades of mastic asphalt) with labels bearing the component name and the product code on the pallet. Each block has a nominal weight of 20 kg.

3.3 IKO Permapark blocks should be stored in the same manner as traditional mastic asphalt.

Assessment and Technical Investigations

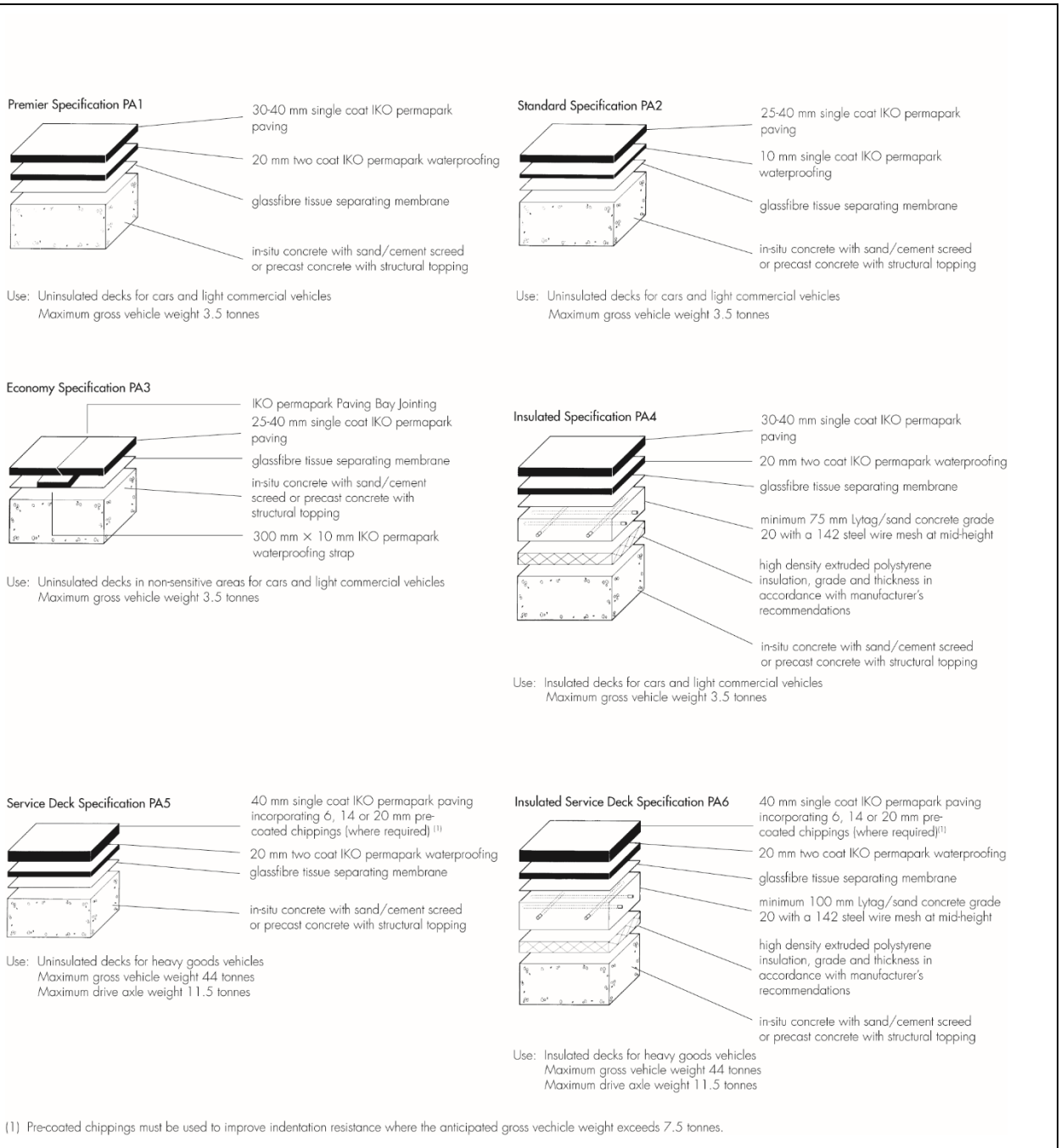
The following is a summary of the assessment and technical investigations carried out on IKO Permapark.

Design Considerations

4 Use

4.1 IKO Permapark is satisfactory for use as a combined waterproof/wearing surface for rooftop car park decks and HGV service decks when applied to a float-finished in-situ or precast and screeded concrete deck laid in accordance with BS EN 1992-1-1 : 2004 and its UK National Annex. The design specification (see Figure 1) must be selected for the appropriate trafficking situation, ie foot traffic, cars and light commercial vehicles or heavy goods vehicles.

Figure 1 IKO Permapark specifications



4.2 Details and the general principles to be followed at skirtings, upstands, abutments, gutters and expansion joints should be as described in BS 8218 : 1998 and the Certificate holder's instructions.

4.3 The concrete structure must be designed to support all static and imposed loads without undue deflection (see Table 1 for the weights imposed by the design specifications). A fall of 1:60 is recommended to ensure good drainage to outlets and gutters.

Table 1 Product and system specification thicknesses and weights

Product/IKO Permapark specification	Thickness (mm)	Nominal weight (kg·m^{-2})
IKO Permapark waterproofing	10	24
	20	49
IKO Permapark paving	25	61
	30	73
	40	98

4.4 Temporary drainage holes should be provided through the structural base to allow the downward drying of residual construction moisture or entrapped rainwater.

4.5 The system can accept, without damage, the foot and vehicular traffic defined in this Certificate, but some indentation should be expected from continuous heavy point loading.

5 Practicability of installation

The system must be installed by a competent contractor experienced with this type of system and registered by IKO PLC.

6 Weathertightness

6.1 The system is an effective barrier against the passage of water, is flexible and can accommodate the movement permitted by BS EN 1992-1-1 : 2004 and its UK National Annex.

6.2 The system will have a water vapour resistance commensurate with typical mastic asphalt and will provide a high resistance to the passage of water vapour.

7 Properties in relation to fire

7.1 In Wales and Northern Ireland, a roof comprising a concrete substrate and fully supported mastic asphalt has a 'notional' B_{ROOF} (t4) designation to BS EN 13501-5 : 2016

7.2 The designation of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

7.3 In England and Scotland, all specifications should be evaluated by reference to the requirements of the documents supporting the national Building Regulations.

8 Resistance to wind uplift

When applied to an air-impermeable deck, the system will resist the effects of wind suction likely to occur in service.

9 Resistance to mechanical damage

9.1 The system can accept the foot and vehicular traffic defined in this Certificate. Some indentation should be expected and reasonable care is required to avoid prolonged loading by sharp objects.

9.2 The system can be detailed to accommodate the movement of designed expansion joints. The Certificate holder should be consulted for approved designs.

10 Maintenance

10.1 Gullies and drains should be kept free from leaves and debris. Annual inspections must be made to report on the general integrity of the paving, paying particular attention to paving joints, expansion joints, mortar pointing, cover flashings, crash barrier supports and upstands.

10.2 Maintenance of the IKO Permapark System must be carried out in accordance with the Certificate holder's recommendations.

11 Durability

11.1 The system will have a life expectancy in excess of that of conventional grades of mastic asphalt used in car parking and HGV service deck situations. With proper maintenance and repair, IKO Permapark will perform satisfactorily for a period of at least 25 years.

11.2 The system is stable at high temperatures and is flexible and resistant to impact damage at low temperatures. Accelerated ageing tests indicate a satisfactory retention of properties.

11.3 The system has good chemical resistance to hydraulic fluids and aqueous solutions of acids, alkalis and de-icing salts, and is unaffected by contact with an alkaline substrate. Prolonged exposure to petrol and diesel may cause localised softening of the binder. In high-risk situations, the advice of the Certificate holder should be sought, and a proprietary coating system used.

Installation

12 General

12.1 Block material for re-melting on site is available for detail work and small horizontal areas. The size and amount of coarse aggregate added to the re-melted paving material is dependent on laid thickness (see Table 2).

Table 2 Aggregate additions to paving material supplied in block form

Paving thickness (mm)	Size of coarse aggregate (mm)	Aggregate content (%)
25	6	30
30	6 or 10	35
40	10	45

12.2 Concrete plinths must be cast off the structural slab to accommodate such features as crash barriers and handrail stanchions. The plinths should be at least 150 mm high and weatherproofed with IKO Permapark waterproofing and a metal flashing where appropriate.

12.3 Where thermal insulation is required above the structural slab (see IKO Permapark design Specifications PA4 and PA6), high-density extruded polystyrene is loose-laid direct to the float-finished base. Boards are tightly butted together with staggered joints, and accurately trimmed at abutments. An overlay of Lytag/sand concrete grade 20 is applied direct to the extruded polystyrene with type A142 steel wire mesh reinforcement placed at mid-height throughout.

12.4 Concrete structures should be designed and built in accordance with BS EN 1992-1-1: 2004 and its UK National Annex.

12.5 New concrete(1) must be well compacted and finished, preferably by power floating, and without excessive laitance, to a dense, smooth finish, free from defects.

(1) Concrete toppings/screeds must be well compacted and bonded to the substrate and have a skip float finish with minimum laitance.

12.6 A curing period of 28 days is normally allowed before installing the system on new concrete substrates. However, as IKO Permapark is installed on a separating membrane of glass fibre tissue, this can be reduced without detriment to the system.

12.7 The surface must be dry, clean and free from loose particles, paint, grease and oil, or other contaminants which may affect the application of the system.

12.8 Substrates should be free from physical defects such as cracks. Small surface defects can be filled with a proprietary mortar.

12.9 When application is made to an existing substrate, the advice of the Certificate holder must be sought.

12.10 Upstands should be treated in accordance with the recommendations of BS 8218 : 1998 and the Certificate holder's instructions.

13 Procedure

13.1 Installation of the waterproofing layer should be carried out using the techniques for laying mastic asphalt described in the relevant clauses of BS 8218 : 1998. Where this is not controlled by hot charge delivery, advice on the laying temperature of the paving layer should be obtained from the Certificate holder. The maximum heating temperature must be ≤ 230°C.

13.2 Where a 20 mm thick coat of IKO Permapark waterproofing is required, it is applied in two coats over the glass fibre tissue separating membrane.

13.3 IKO Permapark paving is applied in a single layer. The surface is rubbed with coarse sharp sand with a wooden float, during the final floating of the hot asphalt. If required, a dimpled surface may be achieved by the use of a crimping roller.

13.4 Steel gauges must be used to ensure the correct thickness of the asphalt layers. Splayed steel gauges must be used to provide a bonding edge between adjacent bays of IKO Permapark paving.

13.5 Ramps must be cross-tamped and lightly primed with high-bond primer. To prevent undue thinning of IKO Permapark waterproofing, tamps must not exceed 5 mm in height, and it may be necessary to reduce the bay size to reduce slump during application. The advice of the Certificate holder should be sought regarding the design of service deck ramps for heavy goods vehicles.

13.6 Where the anticipated gross vehicle weight exceeds 7.5 tonnes, 6 mm, 14 mm or 20 mm pre-coated chippings must be rolled into the surface to improve indentation resistance, but the uneven scatter of chippings will reduce the aesthetic appearance of the paving. The paving surface must not be sand-rubbed when pre-coated chippings are used.

14 Repairs

Localised repairs must be conducted by a specialist asphalt contractor generally in accordance with the recommendations of BS 8218 : 1998, Clause 11.3 *Repair procedures* and/or the Certificate holder's instructions.

Technical Investigations

15 Tests

15.1 Tests were carried out on samples of IKO Permapark and its asphaltic cement, and the results assessed to determine:

asphaltic cement

- ash content
- ring and ball softening point
- penetration

IKO Permapark

- density
- mass per unit area
- tensile strength and elongation on unaged and heat aged samples
- dimensional stability
- water vapour permeability
- ring and ball softening point
- hardness on unaged and heat aged samples
- resistance to water pressure
- flow resistance
- static indentation on soft and hard substrates

- hard body impact at -10 and +20°C
- abrasion resistance
- resistance to chloride ion penetration
- resistance to long-term loading.

15.2 An assessment was made of the results of tests conducted on the Permaphalt Roof Waterproofing System (the subject of BBA Certificate 89/2299) in the context of this Certificate.

16 Investigations

16.1 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.

16.2 An assessment was made of the system's behaviour in fire, based on the performance of the Permaphalt Roof Waterproofing System and traditional grades of mastic asphalt.

16.3 Visits were made to established sites in the UK to assess the system's performance in service.

16.4 Visits were made to sites in progress to establish the system's practicability of installation.

16.5 An assessment was made of the system's durability.

Bibliography

BS 8218 : 1998 *Code of practice for mastic asphalt roofing*

BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 : Design of concrete structures — General rules and rules for buildings* NA + A2 : 14 to BS EN 1992-1-1 : 2004 + A1 : 2014 UK National Annex to *Eurocode 2 : Design of concrete structures — General rules and rules for buildings*

BS EN 13501-5 : 2005 + A1 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

EN 13108-6 : 2016 *Bituminous mixtures — Material specifications — Mastic asphalt*

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

17.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

17.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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