


**IRISH AGREEMENT BOARD
CERTIFICATE NO. 04/0206**

Kingspan Insulation,
Bree Industrial Estate, Castleblayney,
Co. Monaghan, Ireland.
T: +353 (0)42 9795000
F: +353 (0)42 9754237
E: info@kingspaninsulation.ie
W: www.kingspaninsulation.ie

Kingspan Aerofloor Floor Insulation System

**Isolant en polystyrene expansé pour planchers des-de-chausées
Fußboden - Warmedämmung**

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2017**.

PRODUCT DESCRIPTION:

This Certificate relates to Kingspan Aerofloor Floor Insulation System, which is manufactured from high performance polystyrene granules, cut from moulded blocks of EPS. The system is manufactured in accordance with IS EN 13163:2012+A1:2016 *Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification*. The boards are plain edge boards and should be laid closely butting.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2017.

This Certificate replaces IAB Certificate 92/0037.

USE:

The product is used for thermal insulation in ground supported and suspended floors and may be installed:

1. Below a concrete floor slab;
2. Below a cement based screed on a concrete slab with a hardcore base;
3. Above a suspended concrete floor (e.g. block and beam) with a cement based screed;
4. Between the joists of a suspended timber floor.

MANUFACTURE AND MARKETING:

The products are manufactured and marketed by:

Kingspan Insulation,
Bree Industrial Estate,
Castleblayney,
Co. Monaghan.
T: +353 (0)42 9795000
F: +353 (0)42 9754237
E: info@kingspaninsulation.ie
W: www.kingspaninsulation.ie

1.1 ASSESSMENT

In the opinion of NSAI Agrément, Kingspan Aerofloor Floor Insulation System if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2017, as indicated in Section 1.2 of this Irish Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2017**REQUIREMENTS:*****Part D – Materials and Workmanship***

D3 – Kingspan Aerofloor Floor Insulation System, as certified in this Certificate, is comprised of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

D1 – Kingspan Aerofloor Floor Insulation System, as certified in this Certificate, meets the requirements of the building regulations for workmanship.

Part A - Structure**A1 – Loading**

Kingspan Aerofloor Floor Insulation System has adequate strength and stiffness to accept floor loads (see Section 3.2 of this Certificate).

Part B – Fire Safety**B3 – Internal Fire Spread (Structure)*****Part B Vol 2 – Fire Safety*****B8 – Internal Fire Spread (Linings)**

Kingspan Aerofloor Floor Insulation System shall be separated by solid non-combustible material not less than 200mm thick, from any heating appliance or from any flue pipe or opening to a heating appliance.

Part C – Site Preparation and Resistance to Moisture**C4 – Resistance to Weather and Ground Moisture**

Kingspan Aerofloor Floor Insulation System meets the requirements, when installed as indicated in Section 2.4, in floors constructed in compliance with the conditions indicated in Part 3 of this Certificate.

Part F – Ventilation**F1 – Means of Ventilation**

The Kingspan Aerofloor Floor Insulation System, as certified, can be incorporated into structures that meet the requirements of this Regulation.

Part J – Heat Producing Appliances**J3 – Protection of Building**

In the opinion of NSAI Agrément, the Kingspan Aerofloor Floor Insulation System, if used in accordance with this Certificate, can meet the requirements of Part J of the Building Regulations 1997 to 2017.

Part L – Conservation of Fuel and Energy**L1 – Conservation of Fuel and Energy**

The Kingspan Aerofloor Floor Insulation System can contribute to complying with the requirements of this Regulation. The manufacturer's declared thermal conductivity ($\lambda_{90/90}$) of the EPS board is 0.031W/mK.

2.1 PRODUCT DESCRIPTION

Kingspan Aerofloor Floor Insulation System consists of rigid polystyrene boards cut from moulded blocks of EPS manufactured in accordance with IS EN 13163:2012+A1:2016. The boards are plain edge boards and should be laid closely butting.

Kingspan Aerofloor Floor Insulation System has been tested to ensure compliance with the requirements for compressive strength, water vapour transmission, thermal conductivity, thermal resistance and dimensional stability.

The boards do not contain CFCs or HCFC gases and have zero Ozone Depletion Potential.

Table 1 shows the Kingspan Aerofloor Floor Insulation System product range.

Length	1800 and 2400mm
Width	1200mm
Thickness	Any thickness from 12mm upwards
Grade	EPS70, 100, 150 and 200

Table 1: Product Range

2.2 MANUFACTURE

Kingspan Aerofloor Floor Insulation System boards are manufactured from polystyrene granules. The granules are expanded and moulded into blocks of EPS without the use of additional gases and cut to size from the block. They are plain edged on all four sides.

Quality control checks include board dimensions, density, compressive strength and thermal conductivity.

2.3 DELIVERY, STORAGE AND MARKING

Kingspan Aerofloor Floor Insulation System boards are delivered to site polyethylene wrapped. Each pack carries a label bearing the CE marking together with the product description, product characteristics, manufacturer's name, NSAI Agrément identification mark and NSAI Agrément Certificate number for the system.

Handling and storage arrangements must comply with the recommendations of Paragraph 8 and 9 of BS 6203:2003 *Guide to fire characteristics and fire performance of expanded polystyrene materials (EPS and XPS) used in building applications*. Boards must be protected from prolonged exposure to sunlight, and should be

stored under cover in their original wrapping, not in contact with ground moisture and raised above ground level. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar and timber newly treated with creosote.

The boards must not be exposed to a naked flame or other ignition source.

2.4 INSTALLATION

Laying below the floor slab

Where Kingspan Aerofloor Floor Insulation System is used below the floor slab, lay the hardcore in layers (min 150-225mm). Each layer should be well-compacted with the surface blinded with quarry dust or sand to provide a suitable surface for laying a DPM (damp proof membrane).

A DPM, e.g. 1200 gauge polythene, or a radon barrier, subject to site conditions, should be laid over the blinding with joints taped to prevent the passage of ground moisture. The DPM should be carried up the wall until it meets and seals with the DPC (damp proof course).

Kingspan Aerofloor Floor Insulation System should be laid with closely butted joints, laid staggered with a break-bonded pattern and fitted tightly at the edges and around any service penetrations.

Vertical upstands of insulation 25mm thick should be placed at the floor perimeter, party walls and internal rising walls to minimise thermal bridging.

Care should be taken to avoid damage to the insulation or DPM and radon barriers as the slab is being poured and operatives should make use of barrow runs and walkways whilst installation progresses.

Laying below the floor screed

Where Kingspan Aerofloor Floor Insulation System is used below the floor screed, the same procedure should be followed ensuring that the floor slab onto which the insulation is being laid is level.

The concrete floor over which the insulation is to be laid should be left as long as possible to maximise drying out in accordance with the relevant recommendations of BS 8203:2001 +A1:2009 *Code of practice for installation of resilient floor coverings*.

The minimum thickness of sand and cement screed is 65mm for domestic construction and 75mm for most other buildings. However, architectural specifications should be consulted.

Laying on precast block and beam floor

The floor surface should be smooth and flat – any irregularities should be removed. Lay a DPM to ensure that it is correctly positioned and turned up to meet the seal with the DPC.

Kingspan Aerofloor Floor Insulation System should be laid with tightly butted and staggered joints. During construction the boards must be protected from damage by moisture sources, water spillage, plaster droppings etc. Use scaffold boards to prevent wheelbarrow and other traffic damage to the boards.

As in the case with solid ground floors, attention should be given to detailing to avoid thermal bridging.

All surfaces should be level to accept the Kingspan Aerofloor Floor Insulation System. Uneven surfaces should be levelled prior to the laying of the floor.

Laying between the joists of a suspended timber floor

Kingspan Aerofloor Floor Insulation System should be cut to fit between the timber joists and supported by carriers. These may be nails part-driven into the side of the joists at selected level, timber battens or proprietary saddle clips.

Where services need to be accommodated below the floor, Kingspan Aerofloor Floor Insulation System can be lowered to provide an insulated duct.

Install flooring grade chipboard, ply or softwood timber flooring directly onto the joists, fixing in the normal manner.

Ensure that the void below the insulated suspended floor is well ventilated and that sleeper walls do not restrict the airflow.

Cutting

On-site trimming of boards where necessary to maintain continuity of insulation around opes is easily executed using a fine tooth saw or builder's knife.

3.1 GENERAL

Kingspan Aerofloor Floor Insulation System, when installed in accordance with this Certificate, is effective in reducing the U-value (thermal transmittance) of new and existing floor constructions.

Ground supported floors incorporating the Kingspan Aerofloor Floor Insulation System must include a suitable DPM laid in accordance with BS CP 102:1973 *Code of practice for the protection of buildings against water from the ground* (as read with AMD 1511, AMD 2196 and AMD 2470).

Suspended concrete ground floors incorporating Kingspan Aerofloor Floor Insulation System must include suitable ventilation.

The overlay to Kingspan Aerofloor Floor Insulation System should be:

1. A cement based floor,
2. A concrete slab, or
3. Timber, OSB or particleboard.

3.2 FLOOR LOADING

The design loadings for self-contained single family dwelling units as defined in IS EN 1991-1-1:2002+NA:2013 *Eurocode 1 – Actions on structures – General actions – Densities, self-weight, imposed loads for buildings* are:

- Uniformly distributed load 1.5-2.0kN/m²
- Concentrated load 2.0-3.0kN

Kingspan Aerofloor Floor Insulation System covered with the relevant grade of timber, particle board, OSB or similar material or a screed can support these design loadings without undue deflection.

Where Kingspan Aerofloor Floor Insulation System is used under a concrete slab, resistance to concentrated and distribute loads is a function of the slab specification.

3.3 UNDERFLOOR SERVICES

The maximum continuous working temperature of EPS is 80°C. Where underfloor heating systems are to be used, the advice of the Certificate holder should be sought.

3.4 WATERPROOFING

If an overlay of chipboard, OSB or similar material is to be used in bathrooms or kitchens, a continuous waterproof finish (e.g. vinyl) must be provided to protect it.

4.1 BEHAVIOUR IN FIRE

Kingspan Aerofloor insulation boards are combustible and must be protected from naked flames and other ignition sources during and after installation. The boards when in proximity to a constructional hearth must be protected by 250mm of solid concrete as detailed in Diagram 14 of TGD to Part J of the Building Regulations 1997 to 2017.

Toxicity – Negligible when used in ground floor construction.

As Kingspan Aerofloor Floor Insulation System is manufactured without the use of CFCs or HCFCs, there is no release of such gas on burning.

4.2 STRENGTH

Kingspan Aerofloor Floor Insulation System when installed in accordance with the manufacturer's instructions and this Certificate, will resist the loads likely to be met during installation and in service.

4.3 RESISTANCE TO MOISTURE

Kingspan Aerofloor Floor Insulation System will not allow moisture to cross the floor construction provided it is installed in accordance with this Certificate (see Section 2.4).

4.4 WATER VAPOUR PENETRATION AND CONDENSATION RISK

The Kingspan Aerofloor Floor Insulation System has a water vapour diffusion resistivity factor ' μ ' of 20 to 40. It has a significant release to the passage of water vapour.

4.5 THERMAL INSULATION

Calculations of the thermal transmittance (U-value) of specific constructions should be carried out in accordance with IS EN ISO 6946:2007 *Building components and building elements – Thermal resistance and thermal transmittance – Calculation method*, using a manufacturer's declared thermal conductivity value as outlined in Table 2 of this Certificate. The U-value of a construction will depend on the materials used and the design. Examples of U-value calculations are given in Table 3 of this Certificate.

A full listing of U-value calculations is available from the Certificate holder on request. End users should seek guidance from the Certificate holder on U-values that can be achieved.

The product can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings.

Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the DoHPCLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details*.

4.6 LIMITING THERMAL BRIDGING

The linear thermal transmittance ψ (Psi) describes the heat loss associated with junctions and around openings. The certificate holder has carried out ψ -value calculations for a wide range of thermally bridged junctions for new build. A full listing of ψ -value calculations, along with AutoCAD building details on which calculations are based, are available from the Certificate holder on request.

For window jambs, door reveals and all building junctions, when shown to be equivalent or better than junctions detailed in the DoHPCLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details*, then it is acceptable to use the linear thermal transmittance values outlined in Table D1 of TGD to Part L of the Building Regulations 1997 to 2017. When all bridged junctions comply with the requirements of Table D1, 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 on the 'Certificate of Compliance' for that project for use in future BER calculations.

ψ -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 *Conventions for calculation linear thermal transmittance and temperature factors*, in accordance with Appendix D of TGD to Part L of the Building Regulations 1997 to 2017.

4.7 ELECTRICAL & PLUMBING SERVICES

The positioning and future access to all plumbing and electrical cabling services should be carefully considered during the design phase of the construction. On request, the Certificate holder's representatives may attend the site to provide advice regarding correct installation with regard to electrical and plumbing services.

Electrical installation should meet the requirements of ETCI publication ET207 *Guide to the National Rules for Electrical Installations as*

Applicable to Domestic Installations. Kingspan Aerofloor Floor Insulation System shall not be placed in direct contact with electrical cables or hot water pipes (max temp 80°C).

4.8 DURABILITY

Kingspan Aerofloor Floor Insulation System boards are rot-proof and durable. As floor insulation, the boards are judged to be stable and will remain effective as an insulation system for the life of the building, once installed in accordance with this Certificate and the manufacturer's instructions.

4.9 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour transmission
- Long term water absorption by diffusion
- Dimensional accuracy
- Compressive stress
- Bending strength
- Dimensional stability
- Thermal conductivity
- Thermal resistance
- Efficiency of the construction process

4.10 OTHER INVESTIGATIONS

- Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.
- The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.
- A condensation risk analysis was performed.

4.11 CE MARKING

The manufacturer has taken responsibility of CE marking the Kingspan Aerofloor Floor Insulation System in accordance with harmonised European Standard EN 13163:2012+A1:2016. An asterisk (*) appearing in this Certificate indicates that data shown is an essential characteristic of the product and declared in the manufacturers Declaration of Performance (DoP). Reference should be made to the latest version of the manufacturer's DoP for current information on any essential characteristics declared by the manufacturer.

Kingspan Aerofloor			
Essential Characteristics	Performance	Test Method	Harmonised Standard
Thermal Conductivity*	0.031W/mK	EN 12667	EN 13163:2012 +A2:2016
Compressive Strength*	CS(10)70	EN 826	
Bending Strength*	≥115 kPa	EN 12089	
Water Vapour Resistance Factor (μ)	20 – 40		
Water Vapour Permeability (mg/Pa.h.m)*	0-018-0.036	EN 12086	
Reaction to Fire*	Euroclass F	EN 13501-1	
Dimensional Stability	DS(N)5		

Table 2: Product Characteristics

Solid Concrete Ground Based Floors						
	Perimeter/Area (m ²)					
Insulation Thickness	0.2	0.3	0.4	0.5	0.6	0.7
25mm	-	-	-	-	-	-
40mm	-	-	-	-	-	-
50mm	0.25	-	-	-	-	-
60mm	0.23	-	-	-	-	-
75mm	0.20	0.23	0.25	-	-	-
100mm	0.17	0.19	0.21	0.22	0.23	0.23
120mm	0.16	0.17	0.19	0.19	0.20	0.20
150mm	0.13	0.15	0.16	0.16	0.17	0.17
200mm	0.11	0.12	0.13	0.13	0.13	0.13
250mm	0.09	0.10	0.10	0.11	0.11	0.11
Beam & Dense* Block Ground Floors						
	Perimeter/Area (m ²)					
Insulation Thickness	0.2	0.3	0.4	0.5	0.6	0.7
25mm	-	-	-	-	-	-
40mm	-	-	-	-	-	-
50mm	-	-	-	-	-	-
60mm	0.24	-	-	-	-	-
75mm	0.22	0.24	0.25	-	-	-
100mm	0.19	0.20	0.21	0.22	0.22	0.23
120mm	0.17	0.18	0.19	0.19	0.19	0.20
150mm	0.14	0.15	0.16	0.16	0.16	0.17
200mm	0.12	0.12	0.13	0.13	0.13	0.13
250mm	0.10	0.10	0.10	0.11	0.11	0.11
*Calculations assume dense block infill of λ value 1.13W/mK						

Table 3: Ground Floor Construction Typical U-values (W/m²K)

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 latest revision so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2017 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 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, 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.

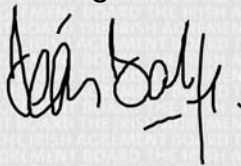
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is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

NSAI Agrément

This Certificate No. **04/0206** is accordingly granted by the NSAI to **Kingspan Insulation** on behalf of NSAI Agrément.

Date of Issue: **August 2004**

Signed



Seán Balfe
Director of NSAI Agrément

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.n sai.ie

Revisions: 10th January 2018

- References to Building Regulations and standards updated, name of product changed, product specifications updated to reflect manufacturer's DoP.
- **17th December 2020:** General revision.