Bord Agrément na hÉireann
Irish Agrément Board

CERTIFICATE No. 04/0097

Airpacks Ltd.,
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Airpacks 'Airfloor' Floor Insulation System

Isolent en polystyrene expancé pour planchers des-de-chausseés
Fußboden - Warmedämmung

The **Irish Agrément Board** is designated by Government to issue European Technical Approvals.

Irish Agrément Board 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 2002**.

The **Irish Agrément Board** operates in association with the **National Standards Authority of Ireland (NSAI)** as the National Member of UEAtc.

mPRODUCT DESCRIPTION:
This Certificate relates to the Airpacks 'Airfloor' Floor Insulation System consisting of rigid polystyrene boards cut from moulded blocks of expanded polystyrene (EPS) manufactured in accordance with IS EN 13163:2001 *Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – 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 2002.

This Certificate replaces IAB Certificate 98/0097.

USE:
The product is used for the 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:
These products are manufactured and marketed by:

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Part One / Certification 1

1.1 ASSESSMENT
In the opinion of the Irish Agrément Board (IAB), Airpacks 'Airfloor' Floor Insulation System if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 - 2002 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2002 REQUIREMENT:

Part D – Materials and Workmanship
D3 – Airpacks 'Airfloor' Floor Insulation System as certified in this Irish Agrément Certificate is comprised of proper materials fit for their intended use (See Part 4 of this Certificate).

D1 – Airpacks 'Airfloor' Floor Insulation System as certified in this Certificate, can meet the requirements of the building regulations for workmanship.

Part A – Structure
A1 – Loading
Airpacks 'Airfloor' 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)
Airpacks 'Airfloor' 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
Airpacks 'Airfloor' Floor Insulation System meets the regulation 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 L – Conservation of Fuel and Energy
L1 - Conservation of fuel and energy
Based on the measured thermal conductivity of 0.037W/mK for the Airpacks 'Airfloor' Floor Insulation System, floors incorporating this system can meet the current 'U Value' requirements (see Section 4.4 of this Certificate).

Part Two / Technical Specification and Control Data 2

2.1 PRODUCT DESCRIPTION
Airpacks 'Airfloor' Floor Insulation System consists of rigid polystyrene boards cut from moulded blocks of EPS manufactured in accordance with IS EN 13163: 2001. The boards are plain edge boards and should be laid closely butting. The system is an efficient layer to reduce thermal transmittance of ground supported and suspended concrete floors. Airpacks 'Airfloor' Floor Insulation System can also be used in suspended timber floors between the joists providing a high level of thermal insulation in floors. Airpacks 'Airfloor' Floor Insulation System is tested to ensure compliance with the requirements for compressive strength, water vapour transmission, thermal conductivity, thermal resistance and dimensional stability.

Airpacks 'Airfloor' Floor Insulation System is placed below the slab or between the slab and the screed. It can also be used between the joists of a suspended timber floor. Vertical upstands of insulation should be used to separate the screed/slab from the wall to reduce thermal bridging at the wall/floor junction. The Airpacks 'Airfloor' Floor Insulation System does not contain CFC's or HCFC gases and has zero Ozone Depletion Potential.

Table 1 shows the Airpacks 'Airfloor' Floor Insulation System product range.

Length	1200, 1800 and 2400mm
Width	600 and 1200mm
Thickness	70, 75, 80, 85, 90, 95, 100mm
Grade	EPS 80 and 150

Table 1: Product Range

2.2 MANUFACTURE
Airpacks 'Airfloor' Floor Insulation System boards are manufactured from polystyrene granules from external suppliers. The granules are expanded into blocks of EPS without the use of additional gases and cut to size from the block. They are plain edge on all four sides.

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

2.3 DELIVERY, STORAGE AND MARKING
Airpacks 'Airfloor' Floor Insulation System is delivered to site polythene wrapped. Each pack carries a label bearing the CE Marking together with the product description, product characteristics, manufacturer's name, IAB identification mark and IAB Certificate number for the system. Installation instructions and details outlining the steps necessary to ensure proper installation are included in each pack.

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 newly treated timber.

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

2.4 INSTALLATION

Laying below the floor slab

Where Airpacks 'Airfloor' 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 damp proof course.

Airpacks 'Airfloor' 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 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 Airpacks 'Airfloor' 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 *Code of practice for the 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.

Airpacks 'Airfloor' Floor Insulation System should be laid with joints 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. Airpacks 'Airfloor' Floor Insulation System should be over laid with 500 gauge polythene sheet to prevent the wet screed from penetrating the joints between the insulation 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 Airpacks' Airfloor' Floor Insulation System. Uneven surfaces should be levelled prior to the laying of the floor.

Laying between the joists of a suspended timber floor

Airpacks 'Airfloor' 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, Airpacks 'Airfloor' 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.

Part Three / Design Data 3

3.1 GENERAL

Airpacks 'Airfloor' 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 Airpacks 'Airfloor' 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 Airpacks 'Airfloor' Floor Insulation System must include suitable ventilation.

The overlay to Airpacks 'Airfloor' Floor Insulation System should be:

1. A cement based floor, or
2. A concrete slab

3.2 FLOOR LOADING

The design loadings for self contained single family dwelling units as defined in BE 6399-1:1996 *Loading for buildings – Code of practice for dead and imposed loads,* are:

- Uniformly distributed load 1.5kPa
- Concentrated load 1.4kPa

Airpacks 'Airfloor' Floor Insulation System covered with chipboard, OSB or similar material or a screed can support these design loadings without undue deflection.

Where Airpacks 'Airfloor' Floor Insulation System is used under a concrete slab, resistance to concentrated and distributed loads if a function of the slab specification.

3.3 UNDERFLOOR SERVICES

The maximum continuous working temperature of EPS is 80^{o}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.

Part Four / Technical Investigations 4

4.1 BEHAVIOUR IN FIRE

Combustibility – Although Airpacks 'Airfloor' Floor Insulation System is combustible, when used in the context of this Certificate the increase in fire load in the building consequent to its use is negligible.

The boards when in proximity to a constructional hearth must be protected by 250mm of solid concrete of as detailed in Diagram 4 of the TGD to Part J to the Building Regulations 1997 to 2002.

Toxicity – Negligible when used in ground floor construction.

Airpacks 'Airfloor' Floor Insulation System is manufactured without the use of CFCs or HCFCs, there is no release of such gas on burning.

4.2 STRENGTH

Airpacks 'Airfloor' 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 RESISTANE TO MOISTURE

Airpacks 'Airfloor' 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 Airpacks 'Airfloor' 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

The aged thermal conductivity 'λ' value of Airpacks 'Airfloor' Floor Insulation System when measured in accordance with IS EN 12667:2000 *Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meters method – Products of high and medium thermal resistance*, is 0.037 W/mK.

The required maximum U-values for ground floors can be obtained with Airpacks 'Airfloor' Floor Insulation System constructions as indicated in Table 2.

	Thickness (mm)				
P/A	100	90	80	55	50
1.0	0.29	0.31	0.34	0.44	0.47
0.9	0.29	0.30	0.34	0.43	0.45
0.8	0.29	0.30	0.33	0.42	0.44
0.7	0.27	0.29	0.32	0.41	0.43
0.6	0.27	0.28	0.32	0.40	0.42
0.5	0.26	0.27	0.31	0.38	0.40
0.4	0.25	0.26	0.29	0.36	0.37
0.3	0.23	0.24	0.27	0.32	0.33
0.2	0.21	0.22	0.23	0.28	0.29

P/A = Perimeter/Area

Table 2: Ground Floor Construction Typical U Values

4.6 DURABILITY

Airpacks 'Airfloor' Floor Insulation System boards are rot-proof and durable. As floor insulation, the Airpacks 'Airfloor' Floor Insulation System is judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this Certificate.

4.7 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.

4.8 OTHER INVESTIGATIONS

(i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed. Airpacks 'Airfloor' Floor Insulation System does not contain CFC or HCFC gas and has zero ODP.

(ii) 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.

(iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

(iv) A condensation risk analysis was performed.

Property	Declared Value	Test Method
Long Term Water Absorption by Diffusion	WD(V) 10 (less than 10%)	EN 12088
Dimensional Stability	DS(N) 2	EN 1603
Thermal Conductivity 'λ' Value 15 – 20 kg/m^3 Thermal Resistance 15 – 20 kg/m^3 70 mm 75 mm 80 mm 85 mm 90 mm 95 mm 100 mm	0.037 W/mK 1.892 m^{2}K/W 2.027 m^{2}K/W 2.162 m^{2}K/W 2.297 m^{2}K/W 2.432 m^{2}K/W 2.568 m^{2}K/W 2.703 m^{2}K/W	EN 12667
Compressive Strength 15 – 20 kg/m^3 Bending Strength 15 – 20 kg/m^3	> 92 kPa > 171.1 kPa	EN 826 EN 12089
Water Vapour Diffusion Resistance Factor μ	20 to 40	Tabulated Value
Water Vapour Permeability δ	0.018 – 0.036 mg/(Pa.N.M)	Tabulated Value

Table 4: Physical Properties of Airpacks 'Airfloor' Floor Insulation System

Part Five / Conditions of Certification 5

5.1 National Standards Authority of Ireland ("NSAI") following consultation with the Irish Agrément Board ("IAB") 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 issue so long as:

(a) the specification of the product is unchanged.

(b) the Building Regulations 1997 to 2002 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 IAB are paid.

5.2 The IAB 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 IAB 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. 1989, 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.

The Irish Agrément Board

This Certificate No. **04/0097** is accordingly granted by the NSAI to **Airpacks Ltd.** on behalf of The Irish Agrément Board.

Date of Issue: **February 1998**

Signed

Chief Executive, NSAI

Readers may check that the status of this Certificate has not changed by contacting the Irish Agrément Board, NSAI, Glasnevin, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.nsai.ie

Revisions: March 2004
Update for CE Marking and Part L of the Building Regulations 1997 to 2002.