Bord Agrément na hÉireann
Irish Agrément Board

CERTIFICATE No. 06/0096

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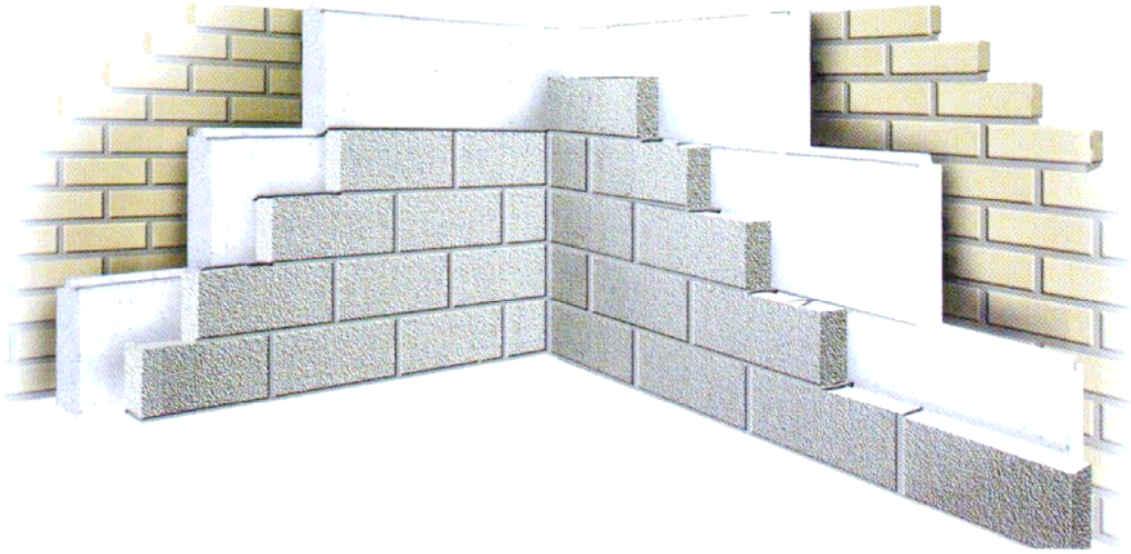
Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems

Isolent en polystyrene
Kerndämmung

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 2006**

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



PRODUCT DESCRIPTION:
This Certificate relates to the Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems as follows:

- 'Airkey' Partial Fill Cavity Wall Insulation System consists 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 tongued and grooved, preventing thermal bridging, to form an interlocking partial fill cavity wall insulation system. A unique mortar lock is designed to prevent thermal looping during the heating and cooling of the wall. The 'Airkey' Partial Fill Cavity Wall Insulation System is fixed to the inner leaf of the cavity wall.
- 'Airkey Plus' Dry Lining System is a composite panel consisting of rigid EPS foam board bonded to 9.5 or 12.5mm plasterboard.

The two products can be used in combination to meet the requirements of the Building Regulations 1997 to 2006.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2006.

This Certificate replaces IAB Certificate 98/0096.

USE:
'Airkey' Partial Fill Cavity Wall Insulation System is used for the thermal insulation of masonry walls up to 25m in height, subject to the separate conditions applying to walls up to 12m and walls over 12m in height contained in Section 3.6 of this Certificate. It also facilitate the control of surface and interstitial condensation in walls.

'Airkey Plus' Dry Lining System is used for the thermal insulation of new or existing solid masonry walls of dwellings or buildings of similar occupancy type and conditions. It also facilitates the control of surface and interstitial condensation in walls.

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 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 – 2006 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2006 REQUIREMENT:

Part D – Materials and Workmanship

D3 – Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems as certified in this Irish Agrément Certificate are comprised of proper materials fit for their intended use (See Part 4 of this Certificate).

D1 – Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems as certified in this Certificate, can meet the requirements of the building regulations for workmanship.

Part B – Fire Safety

B2 – Internal Fire Spread (Linings)

The plasterboard side of Airpacks 'Airkey Plus' Dry Lining System is considered to be Class 0. It may therefore be used on the internal surfaces of buildings of every purpose group.

B3 – Internal Fire Spread (Structure)

Walls using the Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System meet the requirement, provided the completed walls comply with the conditions described in Section 4.1 of this Certificate.

Airpacks 'Airkey Plus' Dry Lining System when fixed with mortar dabs, or on battens, or in contact with the wall will not require the installation of cavity barriers and may be used in buildings of any purpose group. When installed with a residual cavity between the board and the wall, cavity barriers must be provided, and the system may be used in buildings of any purpose group.

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

The Airpacks 'Airkey' & Airkey Plus' Cavity Wall Insulation Systems meet the requirements when installed as Section 2.4 of this Certificate, in walls constructed in compliance with the conditions indicated in Part 3 of this Certificate.

The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System boards do no absorb water by capillary action and may be used in exposures indicated in Section 3 of this Certificate.

Part J – Heat Producing Appliances

J3 – Protection of Building

In the opinion of the IAB, the Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems, if used in accordance with this Certificate, meet the requirement.

Part L – Conservation of Fuel and Energy

L1 - Conservation of fuel and energy

Based on the measured thermal conductivity of Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems, walls incorporating these systems can meet the current 'U Value' requirements (see Section 4.4 of this Certificate).

2.1 PRODUCT DESCRIPTION

Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System

Airpack 'Airkey' Partial Fill Cavity Wall Insulation System consists of rigid polystyrene boards cut from moulded blocks of EPS manufactured to IS EN 13163:2001. The boards are tongued and grooved to form an interlocking partial fill cavity wall insulation system. The tongue and grooved design is ideal for securing a tight and accurate jointing. A unique mortar lock is incorporated to prevent thermal looping during the heating and cooling of the wall. The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System is fixed to the inner leaf of the cavity wall.

The product is fixed with stainless steel wall ties complying with IS 268:1986 *Metal wall ties for masonry walls*. Other IAB approved wall ties may also be used with the system. The boards do not contain CFC or HCFC gases and have zero Ozone Depletion Potential (ODP).

Airpacks 'Airkey Plus' Dry Lining System

Airpacks' Airkey Plus' Dry Lining System is a composite panel consisting of a rigid EPS foam board core bonded to plasterboard. The plasterboard is 9.5 or 12.5mm thick and manufactured to BS 1230-1:1985 *Gypsum plasterboard – Specification for plasterboard excluding materials submitted to secondary operations* using EPS board manufactured to IS EN 13163:2001. The boards do not contain CFC or HCFC gases and have zero ODP.

Table 1 shows the product range of the Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems.

Airpacks 'Airkey'	
Length	1200mm
Width	450mm
Thickness	60, 70 and 110mm
Grade	EPS 80 and 150
Airpacks 'Airkey' Grey	
Length	1200mm
Width	450mm
Thickness	65 and 95mm
Grade	EPS 80 and 150
Airpacks 'Airkey Plus'	
Length	2400mm
Width	1200mm
Thickness	19, 25, 35, 40, 50 and 100mm
Grade	EPS 80 and 150

Other sizes available on request

Table 1: Product Range

2.2 MANUFACTURE

Airpacks 'Airkey' Partial Fill Cavity Wall 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 tongued and grooved on the edges to form an interlocking partial fill cavity wall insulation system.

Airpacks 'Airkey Plus' Dry Lining System boards are manufactured in the same manner. The cut boards are faced with 9.5 or 12.5mm plasterboard, giving a durable surface to accept traditional finishing techniques.

2.2.1 Quality Control

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

2.3 DELIVERY, STORAGE AND MARKING

Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation System boards are 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.

'Airkey' 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. 'Airkey Plus' boards must be stored inside and stacked on a level base with supports every 450mm. 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

2.4.1 Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System

The walls are constructed in the conventional manner, leading with either inner or outer leaf. However it is recommended that the inner leaf be constructed ahead of the outer leaf, because the Airpacks boards are fastened to the cavity face of the inner leaf. This ensures maximum thermal performance. However no masonry leaf should be more than 1m in height above the other during construction.

A section of the inner leaf is built with the first row of wall ties at not greater than 750mm horizontal centres, where the insulation is to begin. It is recommended that the wall ties are not placed directly on the DPC. The first run of insulation

boards must commence below DPC level to provide edge insulation for the floor as required by TGD to Part L of the Building Regulations 1997 to 2006, having regard to the level of mortar fill below DPC level. Ensure that any radon barrier is not damaged.

Wall tie spacings are not to exceed 750mm horizontally and 450mm vertically, and must conform with structural design requirements. At unbonded jambs to all openings in cavity walls, provide wall ties at 225mm vertical centres, located within 150mm of the opening. Table 2 shows the recommended spacing of wall ties.

Cavity Width	Horizontal Spacing mm	Vertical Spacing mm	No. of Wall Ties per square metre
76 – 110	750	450	3.0
111 - 150	450	450	4.9

Table 2: Maximum Wall Tie Spacing

Successive sections of wall incorporating stainless steel wall ties and clips are constructed and Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System boards are installed as work proceeds up to the required height. The stainless steel wall ties and unique 'Airkey' mortar lock meets the inner leaf at every second course. After raising each section of the inner leaf, before installation of Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System, excess mortar should be removed and mortar droppings cleaned from the exposed edges of the installed boards. Use of a cavity batten or similar means is recommended to protect board edges and maintain a clear cavity and prevent mortar build up at the base of the wall. Boards should be fitted together with the tongue upwards and the exposed edges protected at the end of each workday. Damp penetration across the cavity must be prevented with good practice.

On-site trimming of boards where necessary to maintain continuity of insulation around doors, windows or other opes and to coincide with block or brick courses, can be readily executed using a builder's knife.

To prevent damp penetrating across the cavity it is important to ensure the following:

- Mortar filling of cavity at wall base is not too high.
- The DPC should not project into cavity at ground floor level as it can lead to catching mortar droppings, resulting in bridging the cavity.
- Avoid sloping wall ties, due to difference in level between the outer and inner leaf of the cavity wall.
- Keep cavities and wall ties clean, free from mortar droppings. This is achieved with the use of cavity batten and daily cleaning of wall ties.
- The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System boards are tied to the inner leaf properly, i.e. as specified in this Certificate and the manufacturer's instructions.
- Once the Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System is installed in the cavity wall, ensure that there are no gaps in the insulation, as this will reduce the risk of cold bridging.
- Avoid the build up of mortar on trays/lintels and over heads.

2.4.2 Airpacks 'Airkey Plus' Dry Lining System

Airpacks 'Airkey Plus' Dry Lining System is for installation on the internal surface of walls and ceilings of new or existing buildings. The fixing method depends on the substrate.

Installation should be in accordance with good dry lining practice and the manufacturer's instructions. All installations require careful planning and setting out.

Before fixing the product, sufficient time must be allowed to disperse the solvents contained in wood preservatives and damp proofing treatments where applied.

Secondary mechanical fixings

All boards which are not primarily supported using mechanical fixing must be further secured using a minimum of 2 no. mechanical fixing nails of an approved type being not less than 6mm diameter and penetrating at least 30mm into the masonry.

Fire stopping

Fire stopping unless otherwise provided, is achieved by applying a 50mm drywall adhesive ribbon or a pre-treated timber batten fixed to the top and bottom of the panel.

Plaster dab bonding

This method which uses drywall adhesive is for application to brick, block or concrete walls, using 75 x 50mm plaster dabs at the top, bottom and centre of each board. Ribbons of adhesive 50mm wide may also be applied to the back of the boards and laid parallel to the longest edge, in accordance with the manufacturer's instructions. A continuous fillet of drywall adhesive should be used around the perimeter of the wall to ensure an unvented air gap.

Timber battens

Preservative treated timber battens at 60mm centres are mechanically fixed to the wall using traditional techniques and the boards are then fixed to the battens using galvanised clout headed plaster nails or protected screws.

Metal furring

Metal furrings are applied to walls in a defined pattern using multi-purpose adhesive and aligned while the adhesive is still workable. When the adhesive has set the boards are fixed to the

furrings using drywall screws, driven with a power screwdriver. Jointing and finishing are carried out in the usual manner.

Adhesive bonding
Boards may also be directly applied by adhesive using thin wall adhesive on good plaster or fair faced concrete walls where no irregularity exists, in accordance with the manufacturer's instructions.

Mechanical fixings
Boards may also be fixed directly to masonry walls, using approved mechanical fasteners, in accordance with manufacturer's instructions – a minimum of 6 fixings should be used.

Tapered edged boards are jointed and finished in accordance with standard dry lining procedure offering a surface suitable for paper hanging and paint finishes.

Part Three / Design Data 3

3.1 Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems when installed in accordance with this Certificate, are effective in reducing the 'U' value of new external masonry walls, using clay or calcium silicate bricks, concrete blocks, or natural and reconstituted stone blocks. It is essential that such walls are designed and constructed to prevent moisture penetration, having due regard to the prevailing Driving Rain Index.

3.2 Buildings subject to the relevant requirements of the Building Regulations 1997 to 2006 should be constructed in accordance with IS 325-1:1986 *Use of masonry – Structural use of unreinforced masonry* and BS 5628-3:1995 *Code of practice for use of masonry – Materials, and components, design and workmanship*. Where reinforced masonry is involved, the design should be in accordance with BS 5628-2:1985 *Code of practice for use of masonry – Structural use of reinforced and prestressed masonry*. The relevant recommendations of Section 3 of BS 5390-1976(1984) *Code of practice for stone masonry* should be followed where the wall incorporates stone or cast stone.

3.3 As with all cavity wall insulation, the construction detailing should comply with good practice.

3.4 Where a nominal residual cavity width of 40mm is maintained, Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System is suitable for use in any exposure conditions in buildings up to 12m in height. In buildings over 12m and up to 25m in height, the exposure factor must not exceed 122, calculated in accordance with BS 5618-1985(1996) *Code of practice for thermal insulation of cavity walls* and using the Irish Map of Driving Rain Index.

3.5 Data obtained by the IAB confirms that a masonry wall incorporating Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System, built to the requirements of IS 325-1:1986, will not transmit water to the inner leaf.

3.6 Data obtained by the IAB also demonstrates that the Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System boards do not absorb water by capillary action. When the product is used in situations where it bridges the DPC in walls, dampness from the ground will not pass through.

3.7 A minimum cavity width of 40mm should be maintained where possible. Where, for structural reasons, the cavity width is reduced by the intrusion of ring beams or other structural elements, a minimum width of 25mm of cavity should be maintained, and the manufacturer's advice on fixing and weatherproofing should be sought. Raked or recessed mortar joints should be avoided in high exposure areas.

3.8 With dry lining installations forming a void of 20mm or more, services can be incorporated behind the dry lining, making the chasing of the wall unnecessary. When using adhesive systems, or where the services have a greater depth than the void, the wall should be chased rather than the insulation. Care must be taken to ensure that electric cables do not make contact with the insulation.

3.9 The installation of dry lining systems requires careful detailing around doors and windows to achieve a satisfactory surface for finishing. Every effect should be made to minimise the risk of thermal bridging.

3.10 When bonding is by adhesives, it is essential that a satisfactory bond be achieved between the walling material and the adhesives. Backgrounds of high suction will behave differently to those of low suction. The Certificate holder's advice should be sought in case of difficulty.

4.1 BEHAVIOUR IN FIRE

The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System may be used in buildings of any purpose group in a wall in which the cavity intercommunicates with another such cavity, and may be unlimited in extent in respect of the provision of barriers produced the walls comply with Part B3 Diagram 17 of the TGD to Part B of the Building Regulations 1997 to 2006 as follows:

a) The wall consists of two leaves, each being not less than 75mm thick and constructed of non-combustible materials;
b) The cavity does not exceed 110mm in width and is closed by a cavity barrier at the top of the wall and at the top of any opening through any leaf of the wall; and
c) There is no combustible material exposed or situated within the cavity other than:
   (i) Timber lintels, window or door frames or the end faces of joists.
   (ii) Pipes, ducts or cables.
   (iii) Closers, flashings, DPCs or wall ties.
   (iv) Thermal insulating material.
   (v) Meter boxes which require an opening in the outer leaf of not greater than 800 x 500mm and do not penetrate the inner leaf except through a sleeve of not more than 80 x 80mm which is fire stopped where it passes through the inner leaf.

Combustibility – Although 'Airpacks' Partial Fill Cavity Wall Insulation System is combustible, when used in the context of this Certificate, it is unlikely to become ignited should fire penetrate the cavity.

In an unventilated cavity, the amount of air will be insufficient to support combustion and flame spread will be minimal.

Toxicity – Negligible when used in a cavity wall situation.

As Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation System boards are manufactured without the use of CFCs or HCFCs there is no release of such gas on burning.

The plasterboard used in the Airpacks 'Airkey Plus' Dry Lining System is deemed to be Class 0 in accordance with the Building Regulations 1997 to 2006. The insulation component of the board should be isolated from possible sources of combustion.

Airpacks 'Airkey Plus' Dry Lining System boards when installed with a purposely designed residual cavity between the board and the wall, will require the provision of cavity barriers and may be used in buildings of any purpose group provided:

a) Cavity barriers in walls are provided at maximum distances apart or 10m unless a Class 1 material is exposed to the cavity when a spacing of 20m may be adopted.
b) Every such cavity shall be closed by a cavity barrier around the whole perimeter of the wall or ceiling element and around the perimeter of any opening through such an element.
c) Cavity barriers in spaces between a roof and ceiling are provided at maximum distances apart of 20m for any class of surface exposed to the cavity.
d) Where any wall or ceiling containing a cavity meets another such element, the cavities shall be closed.
e) Direction on the provision and spacing of cavity barriers is given in Tables 3.2 and 2.2 of TGD to Part B of the Building Regulations 1997 to 2006.

4.1.1 J3 Protection of Building

Combustible wall insulation material shall generally 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. Particular details are given in Section 2 and Diagrams 2 – 8 of TGD to Part J of the Building Regulations 1997 to 2006. It should also be separated by 40mm from the external surface of a masonry chimney. For chimneys covered by BS 4543-1:1990(1996) *Factory made insulated chimneys*, separation between the insulation and the external surface of the chimney shall be determined in accordance with cl. 2.17 of Part J of the Building Regulations 1997 to 2006.

4.2 WATER PENETRATION

The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System, when used in accordance with this Certificate, presents no significant risk of water penetration.

Capillary Action – The closed cell structure does not allow water vapour uptake by capillary action.

4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK

The Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System has a water vapour diffusion resistivity factor 'μ' of 30 to 70. It has a significant release to the passage of water vapour when used in conventional masonry cavity wall construction. This obviates the risk of surface condensation and present no significant risk of damage from interstitial condensation.

Airpacks 'Airkey Plus' Dry Lining System has a water vapour diffusion resistivity factor 'μ' of 20 to 40 for EPS 80 and 30 to 70 for EPS 150 and is therefore unlikely to be affected by surface or

interstitial condensation, provided all joints between boards are filled and taped in accordance with standard dry lining practice. Interstitial condensation analysis for average winter environmental conditions for both hollow blockwork and cavity wall constructions indicate no condensation risk. When insulating buildings the recommendation of BS 5250:2002 *Code of practice for control of condensation in buildings* should be followed to minimise the risk of condensation within the building elements and structures.

4.4 THERMAL INSULATION

The aged thermal conductivity 'λ' value of Airpacks 'Airkey' Partial Fill Cavity Wall 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 0.034W/mK for the white board and 0.030W/mK for the grey board. The aged thermal conductivity 'λ' value of Airpacks 'Airkey Plus' Dry Lining System when measured in accordance with IS EN 12667:2000 is 0.037W/mK for EPS 80 and 0.034W/mK for EPS 150. The high thermal resistance of the Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems ensures that cold bridging and extra heat loss around the edges of openings can be avoided.

Lintel jamb and cill designs similar to those shown in Diagram 3 of the TGD to Part L of the Building Regulations 1997 to 2006, will be satisfactory to limit thermal bridging.

The required maximum U-values for ground floors can be obtained with Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems constructions as indicated in Table 5.

4.5 DURABILITY

Airpacks 'Airkey' & 'Airkey Plus' Cavity Wall Insulation System boards are rot-proof and durable.

4.6 MATERIALS IN CONTACT WITH ELECTRICAL WIRING

Electrical installations should be in accordance with the ETCI publication ET 207: 2003 *Guide to the National Rules for Electrical Installations as Applicable to Domestic Installations.* It is recommended that cables should not be buried in the insulation and carried in a conduit. In relation to recessed spotlights and other luminaries, ET 207 requires they be not less than the minimum distances from combustible materials as specified in clause 559.3.2 of the TCI National rules of the Electro Technical Council of Ireland ET 101 (current version). For extra low voltage (ELV) it is recommended that only surface mounted ELV lighting be permitted in conjunction with Airpacks 'Airkey Plus' Dry Lining System.

4.6 RESISTANCE TO SOLVENTS, FUNGI AND RODENTS

Airpacks 'Airkey' & 'Airkey Plus" Cavity Wall Insulation System boards do not promote infestation, as there is no food value in the materials used. They also resist attack by mould and microbial growth. The insulation is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl keytone. Adhesives containing such solvents should not be used in association with the boards. Boards which have been in contact with harsh solvents, petrol, mineral oil or acids or boards that have been damaged in any other way should not be used.

4.7 WALL MOUNTED FIXINGS

The recommendations of the manufacturer should be followed. Any object fixed to the wall, other than lightweight items, should be fixed through the lining board into the wall behind, using proprietary fixings.

4.8 MAINTENANCE

Damaged boards can be easily replaced and no maintenance of the insulation will be required provided that the plasterboard layer remains intact.

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
- 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 'Airkey' & 'Airkey Plus' Cavity Wall Insulation Systems do not contain CFC or HCFC gas and have 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 White: 20 – 25 kg/m^3 Grey: 15 – 20 kg/m^3 Thermal Resistance White: 20 – 25 kg/m^3 60 mm 70 mm 110 mm Grey: 15 – 20 kg/m^3 65 mm 95 mm	 0.034 W/mK 0.030 W/mK 1.765 m^{2}K/W 2.059 m^{2}K/W 3.235 m^{2}K/W 2.167 m^{2}K/W 3.167 m^{2}K/W	 EN 12667
Compressive Strength 20 – 25 kg/m^3	> 211 kPa	EN 826
Bending Strength 20 – 25 kg/m^3	> 377.1 kPa	EN 12089
Water Vapour Diffusion Resistance Factor μ	30 to 70	Tabulated Value
Water Vapour Permeability δ	0.007 – 0.018 mg/(Pa.N.M)	Tabulated Value

Table 3: Physical Properties of Airpacks 'Airkey' Partial Fill Cavity Wall Insulation System

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 20 – 25 kg/m^3 Thermal Resistance 15 – 20 kg/m^3 40 mm 50 mm 60 mm 100 mm 20 – 25 kg/m^3 40 mm 50 mm 60 mm 100 mm	 0.037 W/mK 0.034 W/mK 1.081 m^{2}K/W 1.351 m^{2}K/W 1.622 m^{2}K/W 2.703 m^{2}K/W 1.176 m^{2}K/W 1.471 m^{2}K/W 1.765 m^{2}K/W 2.941 m^{2}K/W	 EN 12667
Compressive Strength 20 – 25 kg/m^3	> 211 kPa	EN 826
Bending Strength 20 – 25 kg/m^3	> 377.1 kPa	EN 12089
Water Vapour Diffusion Resistance Factor μ	20 to 40 for EPS 80 30 to 70 for EPS 150	Tabulated Value
Water Vapour Permeability δ 15 – 20 kg/m^3 20 – 25 kg/m^3	 0.018 – 0.036 mg/(Pa.N.M) 0.010 – 0.024 mg/(Pa.N.M)	Tabulated Value

Table 4: Physical Properties of Airpacks 'Airkey Plus' Dry Lining System

Airpacks 'Airkey' EPS 80 and 'Airkey Plus' EPS 80 bonded to plasterboard					
	U-Value				
	0.37	0.35	0.32	0.30	0.27
	Thickness of Insulation in mm of 'Airkey Plus'				
60mm 'Airkey' in cavity	19	24	35	42	55
65mm 'Airkey' in cavity	12	18	28	35	50
70mm 'Airkey' in cavity	12	15	24	31	45
75mm 'Airkey' in cavity	12	12	19	25	40
80mm ' Airkey' in cavity	12	12	15	25	35
Airpacks 'Airkey' EPS 80 and 'Airkey Plus' EPS 150 bonded to plasterboard					
	U-Value				
	0.37	0.35	0.32	0.30	0.27
	Thickness of Insulation in mm of 'Airkey Plus'				
60mm 'Airkey' in cavity	16	22	31	38	50
65mm 'Airkey' in cavity	12	22	26	33	45
70mm 'Airkey' in cavity	12	15	22	29	41
75mm 'Airkey' in cavity	-	-	18	24	37
80mm ' Airkey' in cavity	-	-	13	20	32

Wall construction: Solid internal and external leaves of brick or block with a 40mm residual cavity

Table 5: Wall Construction Typical U Values

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 2006 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.

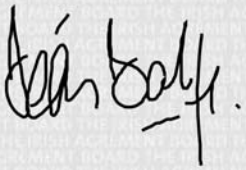
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is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

The Irish Agrément Board

This Certificate No. **06/0096** is accordingly granted by the NSAI to **Airpacks Ltd.** on behalf of The Irish Agrément Board.

Date of Issue: **February 1998**

Signed



Seán Balfe
Director of the Irish Agrément Board

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, June 2006
Update for CE Marking and Part L of the Building Regulations 1997 to 2006.
Inclusion of grey carbon enhanced product.