



NSAI
Agrément

**IRISH AGRÉMENT BOARD
CERTIFICATE No. 08/0319**

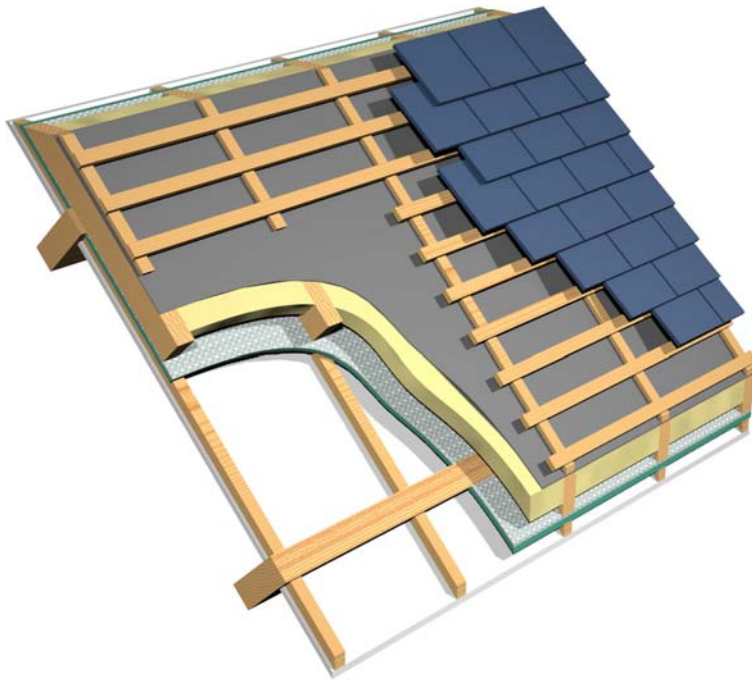
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Airflex Reflective Foil

Sous-toiture Unterspannbahn für Schieferdach oder Ziegeldach

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 2007**.



PRODUCT DESCRIPTION AND USE:

This Certificate relates to **Airflex** reflective foil, which is a multiayered insulation material. It consists of a 3mm thick polyethylene foam core (density 25kg/m³) sandwiched between two layers of bubble polyethylene foil. This in turn is laminated on both sides with a coated aluminium outer layer. The layers are line welded together by means of hot air. The resulting composite sheet incorporates an adhesive layer, which is protected with a silconised paper strip for sealing of spliced joints of adjacent sheets during installation (See Fig.2). This Certificate is substantially based on BBA Certificate No. 07/4503.

To meet Building Regulation requirements **Airflex** reflective foil is used in conjunction with other insulation materials to reduce the 'U' value (thermal transmittance) in new or existing pitched roofs. When installed under the rafters, the product performs as a vapour control layer in the roof system when correctly sealed.

The product is used in constructions where the ceiling follows the pitch of the roof and encloses a habitable space. Care must be taken to ensure that the **Airflex** insulation does not come into contact with heat sources greater than 80°C. As aluminium is a conductor of electricity, the **Airflex** product must be earthed once installed.

MANUFACTURE AND MARKETING:

This product is manufactured and marketed by:

KdB Isolation
Avenue Lotz-Cossé,
BP 47506
France – 44275 Nantes Cedex 2.

1.1 ASSESSMENT

In the opinion of NSAI Agrément, **Airflex** reflective foil is satisfactory for the purpose defined above, and can meet the requirements of the Building Regulations 1997 to 2007 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2007

REQUIREMENT:

Part D – Materials and Workmanship

D3 – Airflex reflective foil, as certified in this NSAI Agrément Certificate, is a proper material, fit for its intended use (see Part 4 of this certificate).

D1- Airflex reflective foil, used in accordance with this Certificate, can meet the requirements of the Building Regulations for workmanship.

Part A – Structure

A1 – Loading

Tests indicate that a roof incorporating **Airflex reflective foil** insulation can meet the requirements provided the installation complies with the conditions set out in Section 2.4 and Part 3 of this Certificate.

Part B – Fire Safety

B4 – External Fire Spread

Airflex reflective foil will not prejudice the external fire resistance of the roof, as indicated in Section 4.1 of this Certificate.

Part F – Ventilation

F2 – Condensation in Roofs

Roofs incorporating Airflex reflective foil will adequately limit the risk of interstitial condensation when designed and constructed in accordance with section 2.4 of this Certificate and the design guidelines contained in Section 2 of the Technical Guidance Document to Part F of the Building Regulations 1997 to 2007 and in Section 8.4 of BS 5250:2002 'Code of Practice for control of condensation in buildings'.

When installed, all joints must be spliced and sealed securely with **Airflex** double sided adhesive strip to form a continuous layer (see Fig. 2), thereby providing an envelope of high vapour resistance.

Airflex reflective foil should be treated as an impermeable vapour control layer when considering the ventilation requirements of the roof.

Part L – Conservation of Fuel and Energy

L1 - Conservation of fuel and energy

Based on the measured thermal resistance value of **Airflex** reflective foil, when used in combination with other Certified insulation materials, roofs incorporating this combination can meet the requirements of Part L of the Building Regulations 1997 to 2007. The correct combination of these materials is selected by calculation for the individual applications.

2.1 PRODUCT DESCRIPTION

Airflex reflective foil is a multi-layered insulation material of nominal thickness 10.4mm. It consists of a 3mm thick polyethylene foam core (density of 25kg/m³) sandwiched between a layer of bubble polyethylene foil. This in turn is laminated on both sides with a coated aluminium outer layer. The layers are line welded together by means of hot air. The composite sheet incorporates an adhesive layer which is protected with a siliconised paper strip for sealing joints.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2007. **Airflex** reflective foil is used in conjunction with other Certified insulation materials to reduce the 'U' value (thermal transmittance) in new or existing pitched roofs. When installed and correctly sealed under the rafters, the product performs as a vapour control layer in the roof. The **Airflex** reflective foil is silver in colour with a one Micron nitrocellulose coating on both of the reflective outer layers. Care must be taken to prevent the product from coming into contact with heat sources greater than 80°C.

Ancillary items:

- Kdb Isolation's 100mm reflective adhesive tape for overlap joint sealing
- stainless steel/aluminium staples/nails #
- additional insulation where required #
- vapour control layer #

these items are outside the scope of this Certificate

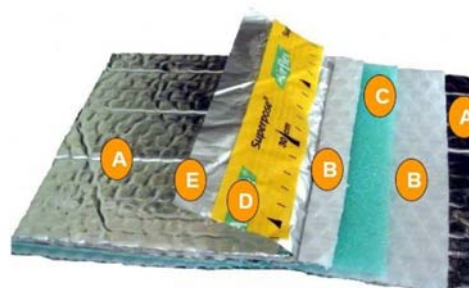
2.2 MANUFACTURE

Airflex reflective foil is manufactured by assembling two layers of aluminium foil backed extruded polyethylene bubble film with a polyethylene foam core which are line welded along the outer edges. The product name is printed on the upper face of the insulation before being rolled on a spindle, cut to length, wrapped and labelled.

The nominal physical characteristics of **Airflex** reflective foil is given in Table 1.

Table 1: Nominal Characteristics

Colour	Silver
Roll Width (m)	1.2
Roll Length (m)	12.5 or 25
Roll Weight (kg)	9 or 17
Material Weight (g/m ²)	599
Mean Thickness (mm)	10.4



- A** 99% Pure Aluminium Film, 30 Microns
- B** Fire-resistant dry Air-Bubble Polyethylene film, 150 Microns
- C** Fire-resistant closed-cell Polyethylene foam film, 25 kg/m³
- D** Adhesive surface
- E** Overlapping strip, 99% pure aluminium, 30 Microns

Figure 1: Showing the individual component elements of **Airflex** insulation.

2.2.1 Quality Control

Quality control checks carried out during production and on the finished product include: visual inspection, checks on dimensions, weight per unit area, tensile strength, elongation test, tear strength, and delamination test.

2.3 DELIVERY, STORAGE AND MARKING

Airflex reflective foil is supplied wrapped in polyethylene film, with a label bearing the company name, product name, technical specifications, basic fitting instructions, NSAI Agrément Logo and Certificate number.

Rolls must be stored horizontally on a flat level surface protected from heat sources and must be kept under cover to protect from long-term exposure to UV light. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar and timbers with newly treated creosote.

Reasonable precautions must be taken in handling the rolls to prevent damage, such as tears/perforations or scratches on the nitro cellulose coating before and during installation, and prior to the application of the roof covering. The product should be stored in single pallet heights only.

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

2.4 INSTALLATION

2.4.1 General

Airflex reflective foil must be installed and fixed in accordance with this certificate and the manufacturers relevant detailed installation instructions and shall not be used in place of a roof tile underlay. The product is installed below rafter level but the following points must be observed during installation:

- (a) Installation of **Airflex** insulation can be carried out in all conditions normal to pitched roofing work in roof construction. It is important to remember however, that **Airflex** reflective foil should not be used in place of the normal roofing membrane.
- (b) A minimum air space of 20mm on either side of the reflective foil must be maintained in all situations.
- (c) A vapour permeable roof tile underlay shall be installed in roof constructions where the product is used.
- (d) Timber counter battens must be used with all installations.
- (e) The recommendations of ICP 2:2002 '*Code of practice for slating and tiling*' and BS5534-1:2003 '*Code of practice for slating and tiling-Design*' must also be observed.
- (f) The product must be installed with conventional Certified insulation materials in order to achieve the necessary 'U' values in accordance with the current Building Regulations requirements. The correct combination of these materials is selected by calculation for the individual applications.
- (g) The water vapour resistance of the combined insulation materials should be taken into consideration.
- (h) When the **Airflex** insulation is installed below rafter level and correctly sealed with the proprietary sealing tape, it will perform as a vapour control layer and shall be used in conjunction with a vapour permeable roof tile underlay.
- (i) Where treated rafters/roof battens are in direct contact with **Airflex** insulation, sufficient time must be given in order to 'fix' the treatment in the timber prior to fitting the **Airflex** in position. The timber moisture should be maintained at a maximum of 20%.
- (j) As aluminium is a conductor of electricity **Airflex** must be earthed after installation in accordance with the manufacturers installation guidelines.
- (k) When **Airflex** insulation is being installed in strong sunlight, eye protection is necessary, in order to reduce surface glare from the product.
- (l) Additional ventilation will be required during the constructional phase of the building to ensure that the construction moisture has been adequately dissipated before sealing of any roof cavity commences.

2.4.2 Installation Procedure

The **Airflex** insulation foil is installed below the rafters of the dwelling in accordance with the following in conjunction with the manufacturers detailed installation instructions:

Installation commences by unrolling the **Airflex** reflective foil insulation horizontally on the underside of the rafters, starting at the cross bar/wall plate and working towards the ridge of the roof. Care must be taken not to scratch the surface of the material. The upper (as installed) surface is marked with the product name, and this surface should face the rafters on unrolling. The **Airflex** insulation is fixed with 25x40mm timber battens to the rafters using 3 rows of stainless steel staples of minimum length 16mm and spaced 200mm apart. An NSAI Agrément Certified vapour permeable roof tile underlay must be installed on top of the rafters with 25x40mm timber counter battens in accordance with the relevant underlay Certificate when using **Airflex** insulation.

All fixing nails/staples which come into contact with the **Airflex** insulation must be manufactured from aluminium alloy/austenitic stainless steel.

The minimum width of horizontal/vertical laps must be 100mm wide. All overlaps should be made by splicing and sealing with **Airflex** double-sided tape (see figure 2) and secured on to a rafter.

- Where timber on roofs have been freshly treated with wood preservative, it is essential that the manufacturers guidance is sought in relation to chemical attack on both the **Airflex** insulation and the roofing underlay.
- **Airflex** reflective foil has adequate resistance to tearing but is not designed to withstand the weight of operatives. implements should be rested on the insulation membrane.
- Care must be taken not to walk on the **Airflex** membrane, since it has a very low co-efficient of friction, it therefore, does not offer any grip, when wet.
- If the **Airflex** membrane is damaged for whatever reason, repairs can be carried out by replacing the damaged sheet or by overlaying the damaged area with a layer of additional material ensuring a 150mm overlap all round and then securing the overlap with **Airflex** reflective tape. In addition to the above, ensure that the up-slope side is overlapped by the next higher horizontal run of **Airflex** insulation foil, and secured under a counter batten.

- Standard methods of workmanship should be used to apply **Airflex** reflective insulation foil at penetrations and abutments. It must be ensured that the reflective foil is turned up at least 50mm at all abutments. **Where the Airflex insulation is overlapped by metal flashing (other than aluminium) the foil and the flashing must be separated from each other to prevent bi-metallic corrosion.**
 - Penetrations by soil and vent pipes etc. must be dealt with as follows. The insulation foil must be star-cut carefully to prevent tears, closely fitted over the pipe, ensuring that all tabs project upwards along the pipe, and then the tabs taped around the circumference of the pipe. A proprietary collar must be fitted over the pipe to protect the tape.
 - It must be ensured that roof design and construction allows for adequate ventilation of the roof space by providing sufficient eaves openings or tile/ridge ventilators with an equivalent opening area. Due care must be taken to ensure that neither the Airflex insulation nor the underlay obstruct the flow of air at any ventilation opening (See figure 3, 4 and 5).
 - Once Airflex reflective foil is installed, it should be covered by the finished roof coverings as soon as practicable, to minimise the effects of long-term exposure to UV light.
 - The product will perform as a vapour control layer provided that all overlaps are spliced and sealed with Airflex double sided tape, all perforations are sealed and the product is used in conjunction with an NSAI Agrément Certified vapour permeable roof tile underlay.
- When installed in combination with other insulation materials, the water vapour resistance and installation instructions of the additional insulation should be taken into consideration.
 - When fitting the Airflex insulation foil, it is important to commence installation at the internal walls and sealed to the wall/wall plate with sealing tape to ensure adequate sealing is achieved and so prevent any moisture entering the roof structure. The vapour control layer for the internal wall should then be sealed to this.

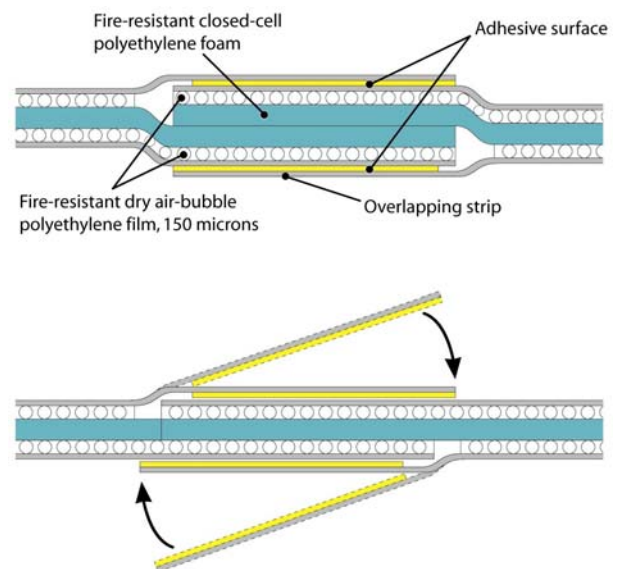


Figure 2: Showing the correct method for sealing overlap joints in Airflex insulation.

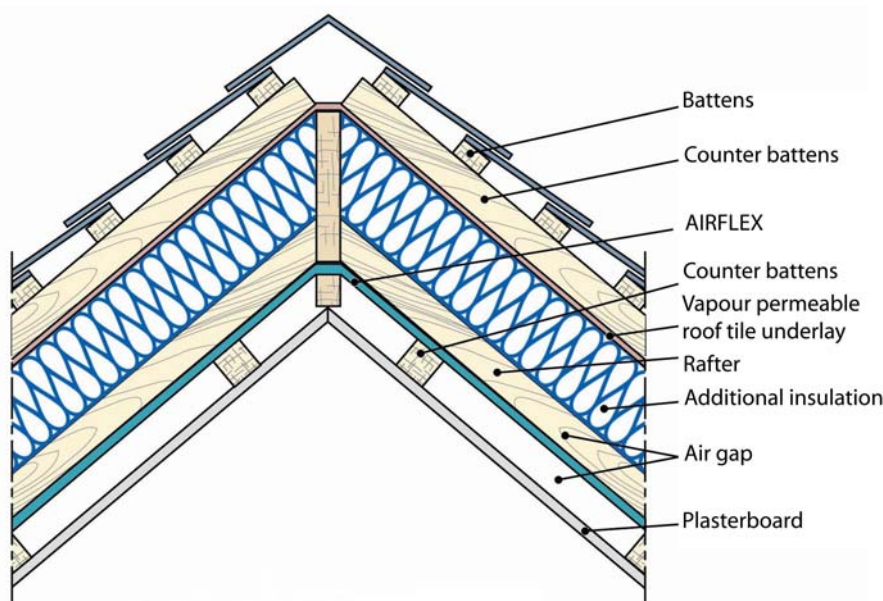


Figure 3: Application of Airflex with additional insulation - Ridge Detail

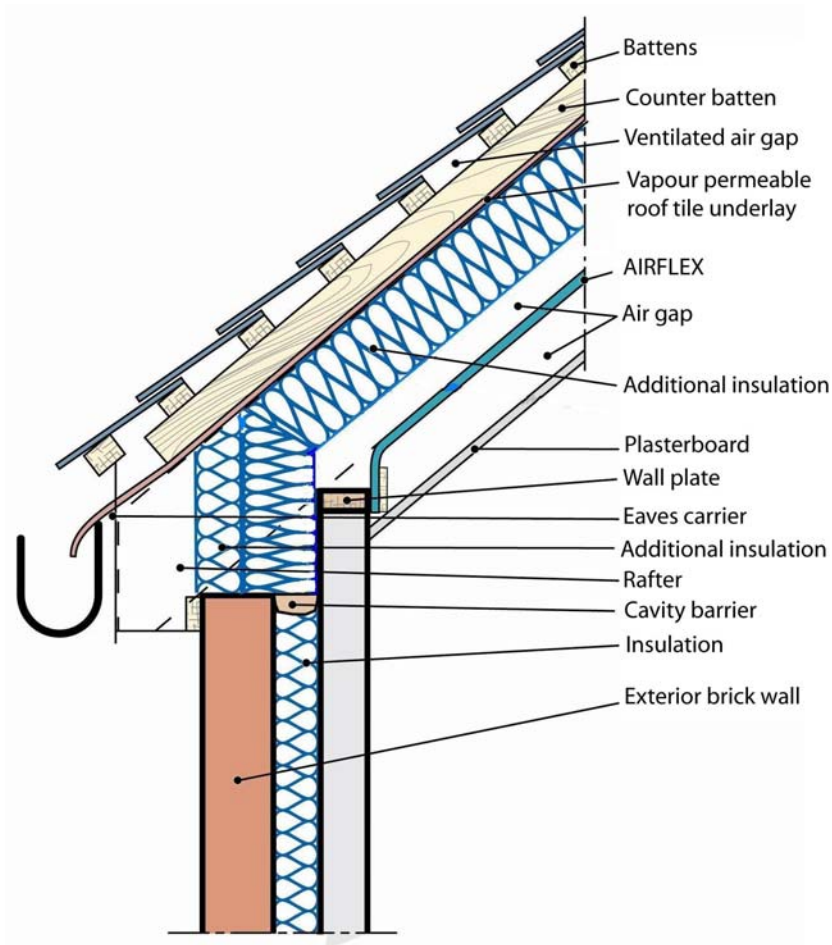


Figure 4: Application of Airflex with additional insulation – Eaves Detail

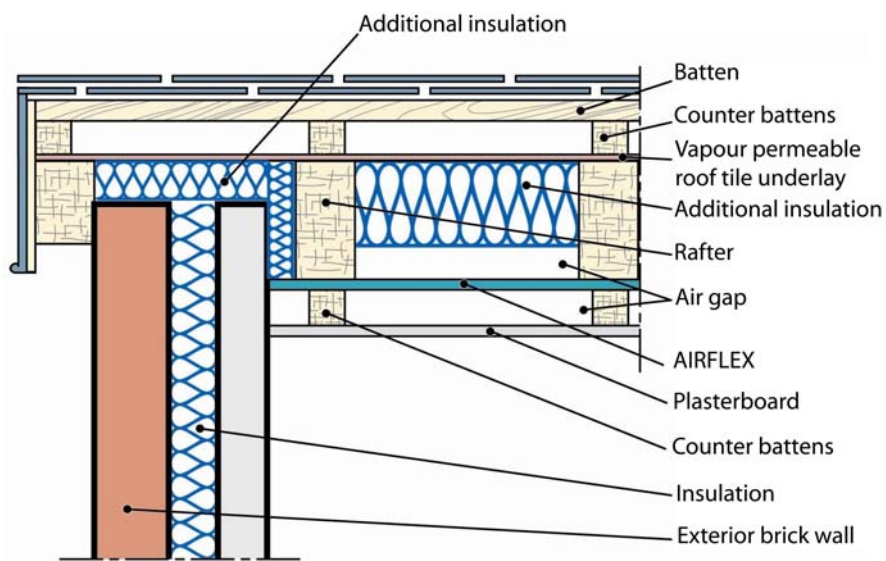


Figure 5: Application of Airflex with additional insulation – Gable Detail

3.1 GENERAL

Airflex reflective foil in combination with other insulation materials is used to reduce the 'U' value (thermal transmittance) in new and existing buildings. When the product is installed under the rafters and correctly sealed with the proprietary double-sided sealing tape, it will perform as a vapour control layer in the roof system.

3.2 Thermal Performance

Calculations of the thermal transmittance ('U' value) of specific roof constructions incorporating **Airflex** reflective foil should be carried out in accordance with IS EN ISO 6946: 1997 *Building components and Building Elements – Thermal Transmittance – Calculation Method with reference to the following values:*

- A thermal resistance of $0.272\text{m}^2\text{KW}^{-1}$ for the **Airflex** reflective foil insulation (nominal thickness of 10.4mm) should be used for the insulation core
- Emissivity of the outer layers is 0.1, however, the emissivity of the surface layer may reduce over the lifetime of the product.
- The thermal resistance of the **Airflex** insulation with a minimum air space of 20mm on both sides is $1.09\text{m}^2\text{KW}^{-1}$ (based on an emissivity value of 0.1).

Typical achievable 'U' values are given in Table 2 for readily available conventional insulation materials in combination with the **Airflex** reflective foil insulation.

3.3 STRENGTH

Airflex reflective foil will resist the loads associated with the installation phase of the roof. However, as the product has a low coefficient of friction care must be exercised as the product/surface will not support foot traffic when either wet or dry. **Airflex** reflective foil has adequate resistance to withstand typical uplift values for various rafter/batten centres when installed above the rafters (See tables 4 and 5).

Design wind speeds should be determined - the maximum net wind pressure must not exceed 2.0kPa as calculated in accordance with BS 6399-2: 1997 '*Loading for buildings: Code of practice for wind loads*'. When used in unsupported applications, draped, wind loading on the **Airflex** insulation should be calculated in accordance with BS 5534:2003 Section 5.5.2.7.

3.4 SEALING OF AIRFLEX FOIL

When fitting either the **Airflex** insulation foil or any vapour control membrane below the rafters, it is important to commence installation at the internal walls and sealed to the wall/wall plate with sealing tape to ensure adequate sealing is achieved and

so prevent any moisture entering the roof structure. The vapour control layer for the internal wall should be sealed to this.

3.5 VENTILATION

Particular attention should be given to ensure that there is adequate ventilation provided above the vapour permeable underlay using counter battens of 25mm minimum thickness. This is necessary in order to provide adequate ventilation to the roof at both eaves and ridge levels in accordance with Part F of the Building Regulations 1997 to 2007. The general guidelines contained in BS 5250: 2002 '*Code of practice for control of condensation in buildings*', sections 8.4.2.3 must also be met when installing this product.

Airflex reflective foil insulation should be treated as an impermeable membrane when considering the ventilation requirements of the roof. Sufficient thermal insulation should be provided in the roof in order to maintain the vapour control layer above the dewpoint.

It is essential that roofs be constructed so as to minimise the risk of moisture vapour entering the roof space and forming condensation. In this regard, all habitable space should be adequately ventilated in accordance with the current Building Regulation requirements. Also, in accordance with good building construction practice, all openings for services should be draught sealed. Recessed lights and similar heat generating fittings are not permitted in ceiling cut outs with this method of construction.

3.6 DE-RATING of ELECTRICAL CABLES

As with all insulation materials care should be taken when installing electrical cables either in or under these products. In some situations, it may be necessary to de-rate electric cabling in these situations. Guidance should be sought from a '**competent person**' in this regard. As aluminium is a conductor of electricity **Airflex** must be earthed after installation in accordance with the manufacturers installation guidelines.

TABLE 2: Typical achievable U-values for tiled or slated pitched roof, occupied or unventilated roof space, supplemental insulation placed between rafters in conjunction with a layer of Airflex under rafters.

Total thickness of supplemental insulation	Thermal conductivity of supplemental insulation (W/m K)				
	0.044	0.038	0.035	0.025	0.021
	'U' Value of construction (W/m²K)				
60	0.36	0.34	0.33	0.29	0.27
70	0.34	0.32	0.31	0.26	0.24
80	0.32	0.30	0.29	0.25	0.23
90	0.30	0.28	0.27	0.23	0.21
100	0.28	0.27	0.25	0.22	0.20
110	0.27	0.25	0.24	0.20	0.19
120	0.26	0.24	0.23	0.19	0.18
130	0.25	0.23	0.22	0.18	0.17
140	0.24	0.22	0.21	0.17	0.16
150	0.23	0.21	0.20	0.17	0.15
160	0.22	0.20	0.19	0.16	0.14
170	0.21	0.19	0.18	0.15	0.14
180	0.20	0.19	0.18	0.15	0.13

This table is derived for roofs with:

Tiles or slates on battens over well-ventilated air layer as outlined in TGD Part F, vapour permeable roof underlay, rafters of 36mm x 200mm ($\lambda = 0.13$) at 400mm centres giving a fractional area of timber of 9%. Insulation thickness between rafters (ref. above) and Airflex insulation with 20mm air gap above and below the Airflex as per Figure 4.

Battens may be fixed to the underside of the rafters to increase rafter depth if necessary.

4.1 BEHAVIOUR IN FIRE

Airflex reflective foil insulation achieved a Class B -s3, d0 classification as per IS EN 13501-1: 2002 *Fire classification of Construction Products and Building Elements- Part 1: Classification Using Data from Reaction to Fire Tests* when tested in accordance with I.S. EN 13823:2002 (see Table 3 for test results). However, being a combustible material there is a risk of fire spread if the material is accidentally ignited during maintenance works e.g. roofer or plumbers torch. As with all types of sarking materials, care must be taken during building and maintenance works to avoid the material becoming ignited. It should not come into contact with heat generating appliances or hot chimney surfaces as per clauses 2.15 to 2.17 of the Technical Guidance Document to Part J of the Building Regulations 1997 to 2007. The insulation must not be carried over junctions between roofs and walls which are required to provide a minimum period of fire resistance. The continuity of fire resistance must be maintained in accordance with the Technical Guidance Document to Part B of the Building Regulations 1997 to 2007. When installed with other additional insulation materials, the fire properties of these materials must be taken into consideration.

4.2 WATER PENETRATION

Airflex reflective foil, when used in accordance with this Certificate, presents no significant risk of water penetration but it should not be used in place of a roof tile underlay.

4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK

Airflex reflective foil has a lower water vapour permeability than that quoted as a minimum for conventional roof tile underlays in BS 5534-1:2003 'Code of Practice for slating and tiling/design'. The general design guides contained in BS 5250: 2002 'Code of practice for control of condensation in buildings' Sections 8.4.2.2 to 8.4.2.6 must be met when installing this product. Refer to Section 3.4 of this certificate for ventilation requirements and information on the use of a sealed vapour control layer when required. **Airflex** reflective insulation foil should be treated as an impermeable underlay when considering ventilation requirements of the roof.

4.4 TESTS AND ASSESSMENTS CARRIED OUT INCLUDED THE FOLLOWING:

- Tensile strength
- Elongation at break
- Tear strength
- Dimensional accuracy
- Dimensional stability
- Water vapour permeability
- Emissivity
- Fire resistance
- Burst Strength
- A condensation risk analysis of typical installations was carried out with **Airflex** in combination with other insulation materials.

4.5 OTHER INVESTIGATIONS

- 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.
- An assessment was made as to the compatibility of the **Airflex** product with treated timber.

Table 3: Airflex Reflective Foil – Fire Test Results

Test Parameters (IS EN 13501-1:2007)	Actual	Upper limit	Test Method
FIGRA _{0.2MJ} (W/s)	84.2	≤ 120	IS EN13823
FIGRA _{0.4MJ} (W/s)	72		
LFS	-		
THR _{600s} (MJ)	3.9	≤ 7.5	
SMOGR _A (m ² /s ²)	100.1		
TSP _{600s} (m ²)	250		
Droplet Production	None		

Tests carried out in accordance with I.S. EN 13823: 2002 – Reaction to Fire Tests for Building Products Excluding Floorings Exposed to Thermal Attack by a Single Burning Item

Table 4: Physical Properties - Directional

		Mean result	Test Method
Tensile strength (kPa)	before ageing	413	I.S. EN 1608 (70°C/90%RH@28days)
	after ageing	425	
Adhesive strength of Airflex (under parallel tension)	before ageing	174	IS EN 1608 (70°C/90%RH@28days)
	after ageing	212	
Nail tear resistance (N)	before ageing	144	I.S. EN 12310-1 (70°C/90%RH@28days)
	after ageing	140	
Dimensional stability (%)		0.1	I.S. EN 13859-1
Adhesive strength of adhesive tape (under parallel tension)	before ageing	500	I.S. EN 1608 (70°C/90%RH@28days)
	after ageing	479	
Elongation at break (N/50mm)	MD}	32%	I.S. EN 13859-1
	CD} after ageing	30%	

Table 5: Service Performance

	Mean result	Test Method
Water vapour permeability (kg/m²/s)	1.4x10 ⁻⁹ (Sd 304m)	I.S.EN 13859-1/I.S. EN 1931 (23°C / 75%RH)
Low Temperature Flexibility	@ -36° C – No cracking	I.S. EN 13859-1/I.S. 1109
Water tightness	Pass	I.S.13859-1/EN 1928 (method A)
Resistance to Wind Load (kPa) -	2 kPa with 300mm batten spacing and 600mm rafter centres	By calculation
Corrosion resistance capacity	satisfactory	I.S. EN 12085/I.S. EN 1602 (23°C@50% RH)

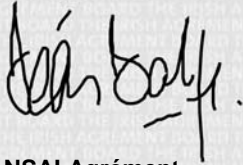
- 5.1** National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which 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 issue so long as:
- (a) the specification of the product is unchanged.
 - (b) the Building Regulations 1997 to 2007 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
 - (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
 - (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
 - (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
 - (f) the registration and/or surveillance fees due to NSAI Agrément are paid.
- 5.2** The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.
- 5.3** In granting Certification, the NSAI makes no representation as to;
- (a) the absence or presence of patent rights subsisting in the product/process; or
 - (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
 - (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.
- 5.4** This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.
- 5.5** Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act, 2005, 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. **08/0319** is accordingly granted by the NSAI to **KdB Isolation**, on behalf of NSAI Agrément.

Date of Issue: **September 2008**

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.nsal.ie