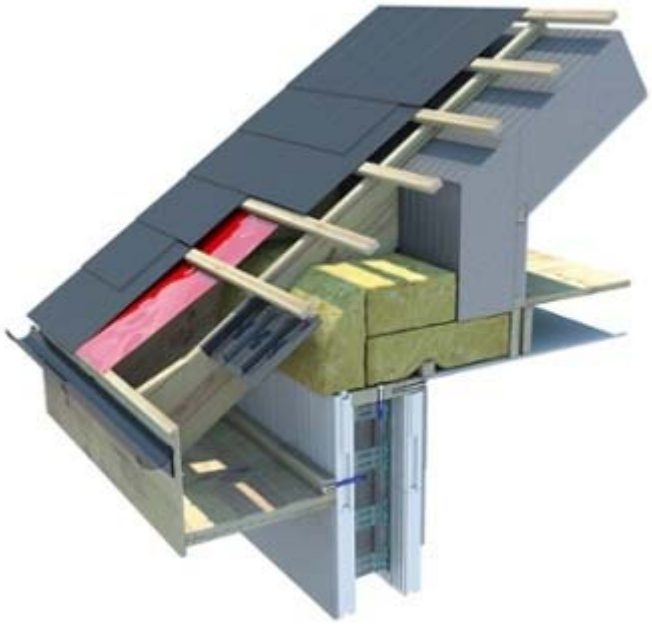
IRISH AGRÉMENT BOARD
CERTIFICATE NO. 05/0235
KORE Insulation,
Kilnaleck, Co. Cavan, Ireland.
T: +353 (0)49 4336998
F: +353 (0)49 4336823
E: info@kore-icf.com
W: www.kore-system.com

KORE Lock Roof Insulation

Isolant en polystyrene expancé pour planchers des-de-chausseés
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 KORE Lock expanded polystyrene insulation system, manufactured in accordance with IS EN 13163:2012+A1:2015 *Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification*.

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

USE:
The system consists of KORE Lock variable width panels, friction fitted between rafters, with KORE Lock liner panel below, to provide a tight fitting insulation envelope in warm and cold roof applications. The system will accommodate most width variations in rafter spacing ensuring optimum performance and allowing a necessary clear airspace above the level of insulation. The product is used for the thermal insulation of pitched and tiled roofs constructed in accordance with SR 82:2017 *Slating and tiling – Code of practice*. It also facilitates the control of surface and interstitial condensation in roofs.

MANUFACTURE AND MARKETING:
The products are manufactured and marketed by:

KORE Insulation,
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1.1 ASSESSMENT

In the opinion of NSAI Agrément, KORE Lock Roof 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 – KORE Lock Roof Insulation System, as certified in this Certificate, is comprised of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

D1 – KORE Lock Roof Insulation System, as certified in this Certificate, meets the requirements of the building regulations for workmanship.

Part B – Fire Safety

Part B Vol 2 – Fire Safety

B2 & B7– Internal Fire Spread (Linings)

As the KORE Lock Roof Insulation System comprises an insulation panel finished with plasterboard liner, it will achieve a Class O performance classification. It may therefore be used on the internal surfaces of buildings of every purpose group.

Roofs using KORE Lock meet this requirement provided the completed roofs comply with the conditions described in Section 4.1 of this Certificate.

B4 & B9 – External Fire Spread

The KORE Lock Roof Insulation System will not affect the external fire rating of roofs in which it is incorporated.

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

The KORE Lock Roof Insulation System, when installed in compliance with the conditions indicated in Part 2 of this Certificate, will not promote the passage of moisture and will minimise the risk of surface or interstitial condensation.

Part F – Ventilation

F2 – Condensation in Roofs

The KORE Lock Roof Insulation System meets these requirements when designed and installed in accordance with Section 2.4 and Part 3 of this Certificate.

Part J – Heat Producing Appliances

J3 – Protection of Building

In the opinion of NSAI Agrément, the KORE Lock Roof 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

Based on the measured thermal conductivity of KORE Lock referred to in this Certificate, the current 'U-value' requirements can be achieved (see Section 4 of this Certificate).

2.1 PRODUCT DESCRIPTION

This Certificate relates to the KORE Lock Roof Insulation System for warm and cold roof applications. KORE Lock variable width panels are friction fitted between the rafters ensuring the inner face of the panel is flush with the bottom of the rafters. KORE Lock liner panels are applied to the underside of the rafters with suitable fixings, ensuring all joints are tightly sealed. The panels are then faced with minimum 500 gauge polyethylene vapour barrier.

KORE Lock Variable Width Panels	
Length	1200mm x 377mm
Thickness	Up to 150mm
Width	To suit rafter design
Density	SD: 15kg/m^3 HD: 20kg/m^3 EHD: 25kg/m^3 UHD: 30kg/m^3 Grey SD: 15.9kg/m^3 Grey HD: 20kg/m^3
KORE Lock Liner Panels	
Length	240mm x 1200mm
Thickness	In 5mm increments
Width	To suit rafter design
Density	SD: 15kg/m^3 HD: 20kg/m^3 EHD: 25kg/m^3 UHD: 30kg/m^3 Grey SD: 15.9kg/m^3 Grey HD: 20kg/m^3

Table 1: Product Range

2.2 MANUFACTURE

KORE Lock Roof Insulation System boards are manufactured from expanded polystyrene and has a flame retardant additive (FRA). KORE Lock insulation boards are manufactured using no HCFC or CFC gases and have zero Ozone Depletion Potential.

2.2.1 Quality Control

Quality control checks are carried out on the incoming raw materials, during production and on the finished product. These checks include board dimensions, density, compressive strength and thermal conductivity.

2.3 DELIVERY, STORAGE AND MARKING

Every pack shows the manufacturer's name, NSAI Agrément identification mark and NSAI Agrément Certificate number.

Boards should be protected in transit and in storage from damage caused by ropes and tie straps. Boards should be protected from prolonged exposure to UV light and should be stored under cover or protected with polyethylene. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar and timbers newly treated with creosote etc.

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

2.4 INSTALLATION

2.4.1 General

Installation must be in accordance with the relevant clauses if SR 82:2017 (for installation in cold roof applications) and the manufacturer's instructions, and can be carried out in all conditions normal for roof and timber frame wall construction.

KORE Lock insulation boards are light to handle and can be easily cut or shaped. The boards will not support the weight of operatives and care must be taken during tiling.

Where the system is installed in traditional and timber frame construction, cavity barriers at the junction of the external wall and roof space should be provided in accordance with the requirements of Part B of the Building Regulations 1997 to 2017.

2.4.2 Procedure

Ensure that the cavity wall insulation has been continued to roof height to engage with the roof insulation. The insulation must be continuous to provide a complete envelope to reduce the risk of thermal bridging and condensation.

Commence by fitting KORE Lock variable width panels between each rafter, following completion of roof cladding, keeping panels flush with the underside face of the rafter and closely butted at ends. This will ensure the necessary clear air space between the insulation and the sarking felt.

Fix first row of KORE Lock panels to roof line at junction with vertical stud walls, beginning with first slot. Secure in position by nailing through batten and insulation into rafters. Repeat procedure until entire area is insulated.

Continue installation of KORE Lock panels to vertical studding and ceiling collars to completion.

Ensure a 50mm clear space is maintained above the insulation to provide the correct level of ventilation.

Apply KORE Lock liner panels to the underside of the rafters with suitable fixings, ensuring all joints are tightly sealed. Face with minimum 500 gauge polyethylene vapour barrier.

Part Three / Design Data 3

3.1 GENERAL

KORE Lock Roof Insulation System, when installed in accordance with this Certificate, is effective in reducing the U-value (thermal transmittance) of new and existing pitched roof constructions. It is essential that such roofs are designed and constructed to prevent moisture penetration having regards to the Driving Rain Index.

Roofs subject to the relevant requirements of the Building Regulations 1997 to 2017 should be constructed in accordance with SR 82:2017.

When installed in accordance with this Certificate, the KORE Lock Roof Insulation System will contribute to the buckling and racking strength of the roof as described in SR 82:2017. However, it is not recommended that they be considered as an alternative to cross-bracing.

During installation, boards must not be walked on except over supporting timbers. The boards have insufficient nail holding ability to be considered as an alternative to timber sarking.

Roof tile underlays must be approved by the manufacturer and be appropriately CE marked.

Moisture entering the roof must be minimised using a minimum of 500 gauge polyethylene with sealed gaps, placed under the inclined ceiling. Gaps in the ceiling should be minimised and service openings should be sealed.

As with all types of insulation, the construction detailing should comply with good practice.

4.1 BEHAVIOUR IN FIRE

KORE Lock Roof insulation boards are combustible and must be protected from naked flames and other ignition sources during and after installation.

Toxicity – Negligible when used in protected roof situation.

KORE Lock insulation is manufactured without the use of CFCs and HCFCs and there is no release of such gas on burning.

4.2 STRENGTH

KORE Lock Roof 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 WIND LOAD

The resistance to wind uplift depends on many factors peculiar to each project. The effect of wind loading should be calculated in accordance with IS EN 1991-1-4:2005+A1:2010 *Eurocode 1: Actions on structures – Part 1-4: General actions – Wind actions (including Irish National Annex)* using the appropriate basic wind speed shown in TGD to Part A of the Building Regulations 1997 to 2017.

When installed in accordance with Section 2.4 of this Certificate, the KORE Lock boards will have sufficient resistance to wind uplift.

4.4 RESISTANCE TO MOISTURE

KORE Lock Roof Insulation System will not be adversely affected by rain during installation for a limited timescale or by wind driven snow or rain penetrating the tiling in service.

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

4.5 WATER VAPOUR PENETRATION AND CONDENSATION RISK

The KORE Lock Roof Insulation System has a water vapour resistance of 145MNs/g. The Certificate holder should be contacted for the purpose of calculating a project specific condensation risk analysis.

The risk of condensation on the underside of the sarking will be minimal under normal conditions of use.

4.6 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*.

4.7 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.

4.8 DURABILITY AND MAINTENANCE

KORE Lock Roof Insulation System boards are rot-proof and durable. As roof 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.

Damaged boards can be easily replaced prior to the installation of counter battens.

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

(i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.

(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.

4.11 CE MARKING

The manufacturer has taken responsibility of CE marking the KORE Lock Roof Insulation System in accordance with harmonised European Standard EN 13163:2012+A1:2015. 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.

KORE Lock EPS70 White / KORE Thermal Board EPS70 White			
Essential Characteristics	**Performance**	**Test Standard**	**Harmonised Standard**
Thermal Conductivity*	0.037W/mK	EN 12667	EN 13163:2012
Reaction to Fire*	Class E	EN 13501-1	
Length*	L3	EN 822	
Width*	W3	EN 822	
Thickness*	T2	EN 823	
Compressive Strength*	CS(10)70	EN 826	
Bending Strength*	BS100	EN 12089	
Dimensional Stability*	DS(N)5	EN 1603	
Flatness*	P(5) ≤0.72m^2 P(15) >0.72m^2	EN 825	
Squareness*	S(5)	EN 824	
Long Term Water Absorption by Partial Immersion*	WL(P)I 0.2kg/m^2	EN 12087	
Long Term Water Absorption by Total Immersion*	WL(T)I 5%	EN 12087	
KORE Lock EPS70 Silver / KORE Thermal Board EPS70 Silver			
Essential Characteristics	**Performance**	**Test Standard**	**Harmonised Standard**
Thermal Conductivity*	0.031W/mK	EN 12667	EN 13163:2012
Reaction to Fire*	Class E	EN 13501-1	
Length*	L3	EN 822	
Width*	W3	EN 822	
Thickness*	T2	EN 823	
Compressive Strength*	CS(10)70	EN 826	
Bending Strength*	BS100	EN 12089	
Dimensional Stability*	DS(N)5	EN 1603	
Flatness*	P(5) ≤0.72m^2 P(15) >0.72m^2	EN 825	
Squareness*	S(5)	EN 824	
Long Term Water Absorption by Partial Immersion*	WL(P)I 0.2kg/m^2	EN 12087	
Long Term Water Absorption by Total Immersion*	WL(T)I 5%	EN 12087	

Table 2: Product Characteristics

Warm Pitched Roof – Insulation Between and Over Rafters (With Sarking Board)		
KORE Lock EPS70 Silver	**KORE Warmsark EPS70 Silver**	**U-Value (W/m²K)**
100mm	50mm	0.22
125mm	50mm	0.19
150mm	50mm	0.17
175mm	50mm	0.15
200mm	50mm	0.14
KORE Lock EPS70 Silver	**KORE Warmsark EPS70 Silver**	**U-Value (W/m²K)**
100mm	100mm	0.16
125mm	100mm	0.14
150mm	100mm	0.13
175mm	100mm	0.12
200mm	100mm	0.11
KORE Lock EPS70 White	**KORE Warmsark EPS70 White**	**U-Value (W/m²K)**
100mm	50mm	0.25
125mm	50mm	0.22
150mm	50mm	0.19
175mm	50mm	0.17
200mm	50mm	0.16
KORE Lock EPS70 White	**KORE Warmsark EPS70 White**	**U-Value (W/m²K)**
100mm	100mm	0.18
125mm	100mm	0.17
150mm	100mm	0.15
175mm	100mm	0.14
200mm	100mm	0.13
Cold Pitched Roof – Insulation Between and Under Rafters (No Sarking Board)		
KORE Lock EPS70 Silver	**KORE Thermal Board EPS70 Silver**	**U-Value (W/m²K)**
100mm	50mm	0.21
125mm	50mm	0.19
150mm	50mm	0.17
175mm	50mm	0.15
200mm	50mm	0.14
KORE Lock EPS70 Silver	**KORE Thermal Board EPS70 Silver**	**U-Value (W/m²K)**
100mm	100mm	0.16
125mm	100mm	0.15
150mm	100mm	0.13
175mm	100mm	0.12
200mm	100mm	0.11
KORE Lock EPS70 White	**KORE Thermal Board EPS70 White**	**U-Value (W/m²K)**
100mm	50mm	0.25
125mm	50mm	0.22
150mm	50mm	0.20
175mm	50mm	0.18
200mm	50mm	0.16
KORE Lock EPS70 White	**KORE Thermal Board EPS70 White**	**U-Value (W/m²K)**
100mm	100mm	0.19
125mm	100mm	0.17
150mm	100mm	0.16
175mm	100mm	0.14
200mm	100mm	0.13

Table 3: 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 issue 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.

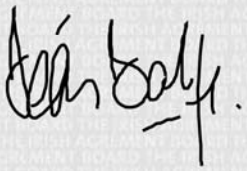
5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

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. **05/0235** is accordingly granted by the NSAI to **KORE Insulation** on behalf of NSAI Agrément.

Date of Issue: **December 2005**

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.nsai.ie

Revisions
9th January 2018: References to Building Regulations and standards updated, product specifications updated to reflect manufacturer's DoP.
22nd December 2020: General revision.