

**IRISH AGRÉMENT BOARD
CERTIFICATE NO. 18/0399**

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K Systems External Wall Insulation Systems

Système d'isolation pour murs extérieurs Wärmedämmung für Außenwand

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 2019**.



PRODUCT DESCRIPTION:

This Certificate relates to the following K Systems External Wall Insulation Systems:

- K Systems E Dash
- K Systems E Acrylic
- K Systems P Dash
- K Systems P Acrylic
- K Systems M Silicone
- K Systems M Dash
- K Systems P Silicone
- K Systems E Brick Rend
- K Systems E Silicone

The systems are comprised of:

- Surface preparation of masonry or concrete substrate;
- Full system beads and render only beads;
- Insulation boards (EPS, phenolic and mineral wool);
- Base coat with reinforcement;
- Decorative finishes (mineral, acrylic, silicone, dry dash);
- Mechanical fixings;
- Adhesive fixings;

- Weather tight joints;
- Movement joints;
- Provision for limiting cold bridging at external junctions in compliance with Acceptable Construction Details published by the DHPLG.
- Provision for fire stopping at external compartment walls and floors.

Kilwaughter Minerals Ltd are responsible for the design, manufacture and supply of all components to approved specifications.

The system is designed by Kilwaughter Minerals Ltd on a project specific basis in accordance with an approved design process.

The installation of the system is carried out by installers who have been trained by Kilwaughter Minerals Ltd, and are approved by Kilwaughter Minerals Ltd and NSAI Agrément to install the system. Applicators must adhere to strict installation guidelines as specified by Kilwaughter Minerals Ltd.

Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting NSAI Agrément, NSAI, Santry, Dublin 9 or online at <http://www.nsai.ie>

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2019.

USE

K Systems E and M External Wall Insulation Systems are suitable for the external insulation of:

- (a) New or existing concrete or masonry dwellings;
- (b) New concrete or masonry commercial or industrial buildings, which are designed in accordance with the Building Regulations 1997 to 2019.

K Systems P External Wall Insulation Systems are suitable for the external insulation of:

- (a) Existing concrete or masonry dwellings;
- (b) New concrete or masonry commercial or industrial buildings, which are designed in accordance with the Building Regulations 1997 to 2019.

The K Systems External Wall Insulation Systems are suitable for use up to a maximum of six storeys (18m) in height in purpose groups 1(a), 1(c), 1(d), 2(a), 2(b), 3, 4(a) and 4(b), and for use up to a maximum of five storeys (15m) in height in purpose group 1(b), as defined in TGD to Part B of the Building Regulations 1997 to 2019.

The systems have not been assessed for use with timber frame or steel frame construction.

In an Irish context, the appropriate 'Impact resistance' category should be specified as described in Section 4.1.2, which lists a range of system build-ups and their corresponding impact resistance categories.

This Certificate is a confirmation of BBA Certificate No. 18/5570 issued by the British Board of Agrément, PO Box 195, Bucknalls Lane, Garston, Watford WD25 9BA.

MANUFACTURE, DESIGN & MARKETING:

The system is designed and manufactured by:

Kilwaughter Minerals Ltd,

9 Starbog Road,

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Co. Antrim,

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Project specific design, technical support, sales, and applicator approval are also performed by Kilwaughter Minerals Ltd.

1.1 ASSESSMENT

The external insulation systems included in this Certificate, which have been tested in accordance with the requirements of ETAG 004^[1] (ref. BBA certificate 18/5570), have been assessed against the specific requirements of the Irish Building Regulations, including method of installation, approval and training of installers, and maintenance requirements of the installed system.

In the opinion of NSAI Agrément, K Systems External Wall Insulation Systems, when installed by Kilwaughter Minerals Ltd trained and approved contractors registered with NSAI, in accordance with this Certificate and Kilwaughter Minerals Ltd specific design, can meet the requirements of the Building Regulations 1997 to 2019, as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2019

REQUIREMENTS:

Part D – Materials and Workmanship

D3 – Proper Materials

K Systems External Wall Insulation Systems, as certified in this Certificate, are comprised of 'proper materials' fit for their intended use (see Part 3 and 4 of this Certificate).

D1 – Materials & Workmanship

K Systems External Wall Insulation Systems, as certified in this Certificate, meet the requirements for workmanship.

Part A - Structure

A1 – Loading

K Systems External Wall Insulation Systems, once appropriately designed and installed in accordance with this Certificate, have adequate strength and stability to meet the requirements of this Regulation (see Part 3 of this Certificate).

A2 – Ground Movement

K Systems External Wall Insulation Systems can be incorporated into structures that will meet this requirement (see Parts 3 and 4 of this Certificate).

Part B – Fire Safety

Part B Vol 2 – Fire Safety

B4 & B9 – External Fire Spread

K Systems External Wall Insulation Systems can be incorporated into structures that will meet this requirement (see Part 4 of this Certificate).

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

External walls have adequate weather resistance in all exposures to prevent the passage of moisture from the external atmosphere into the building.

Part F – Ventilation

F2 – Condensation in Roofs

The systems as certified can be incorporated into structures that will meet the requirements of this Regulation (see Parts 3 and 4 of this Certificate).

Part J – Heat Producing Appliances

J3 – Protection of Building

When K Systems External Wall Insulation Systems are used in accordance with this Certificate, wall lining, insulation and separation distances meet this requirement (see Part 4 of this Certificate).

Part L – Conservation of Fuel and Energy

L1 – Conservation of Fuel and Energy

The walls of K Systems External Wall Insulation Systems can be readily designed to incorporate the required thickness of insulation to meet the Elemental Heat Loss method calculations for walls as recommended in TGD to Part L of the Building Regulations 1997 to 2019 (see Part 4 of this Certificate).

L2 – Conservation of Fuel and Energy

At interface junctions at windows and at junctions between elements, the K Systems External Wall Insulation System installation details have been assessed, and when installed in accordance with this Certificate and the Certificate holder's (Kilwaughter Minerals Ltd) approved installation details, excessive heat losses and local condensation problems associated with thermal bridging will be avoided.

2.1 PRODUCT DESCRIPTION

Table 1a, 1b and 1c list the full components of the K Systems External Wall Insulation Systems.

The systems can be applied on a variety of existing vertical external surfaces such as brick or rendered masonry walls.

The substrate on which K Systems External Wall Insulation Systems will be used must have a reaction to fire class A1 or A2-s1 d0 in accordance with I.S. EN 13501-1^[6].

2.1.1 Ancillary Materials

- Profiles, comprising:
 - Aluminium, powder-coated galvanised steel, PVC-U or stainless steel base profile, edge, corner, render stop end
 - Aluminium, powder-coated galvanised steel, PVC-U or stainless steel edge profile
 - Aluminium, powder-coated galvanised steel, PVC-U or stainless steel corner profile
 - Aluminium, powder-coated galvanised steel, PVC-U or stainless steel stop profile
 - Aluminium, powder-coated galvanised steel, PVC-U or stainless steel V expansion and movement joint profiles
- Profile connectors and fixings
- Silicone based joint sealant
- Algae and fungal wash
- PU foam filler
- Sealing tape
- Fire barrier

All ancillary materials are outside the scope of this certificate.

2.2 MANUFACTURE, SUPPLY AND INSTALLATION

Kilwaughter Minerals Ltd is responsible for the design and manufacture of all components to approved specifications. Kilwaughter Minerals Ltd also have responsibility for:

- Project specific design in accordance with approved design process;
- Preliminary project assessment incorporating wind load calculations, U-value calculations, condensation risk analysis, impact resistance, substrate suitability and pull-out testing of fixings;
- Training, monitoring and review of licensed applicators in accordance with approved training and assessment procedures;
- Product supply and documentation control;
- Technical support and installation supervision;
- Sales and marketing.

The installation of K Systems External Wall Insulation Systems is carried out by Kilwaughter Minerals Ltd trained and approved installers in accordance with Kilwaughter Minerals Ltd project specific specifications and method statements. Installers must also be approved and registered by NSAI Agrément under the NSAI Agrément External Thermal Insulating Composite Systems (ETICS) Approval Scheme (See Section 2.4.1 of this Certificate).

2.2.1 Quality Control

The Certificate holder operates a quality management system, and a quality plan is in place for system manufacture, system design and system installation.

2.3 DELIVERY, STORAGE AND HANDLING

The insulation is delivered to site in packs. Each pack is marked with the manufacturer's details, product identification marks and batch numbers. See each individual Detail Sheet for the insulation types approved for use with each system.

Each container for other components, e.g. renders, adhesives etc., bears the manufacturer's and the product's identification marks and batch number, and the NSAI Agrément logo incorporating the Certificate number.

Insulation should be stored on a firm, clean, dry and level base, which is off the ground. The insulation should be protected from prolonged exposure to sunlight by storing opened packs under cover in dry conditions or by re-covering with opaque polythene sheeting.

Care must be taken when handling the insulation boards, to avoid damage and contact with solvents or bitumen products. The boards must not be exposed to ignition sources.

Mesh-cloth, primers, renders, paints, texture synthetic finish coatings and sealants should be stored in accordance with the manufacturer's instructions, in dry conditions, at the required storage temperatures. They should be used within the stated shelf life.

2.4 INSTALLATION

2.4.1 Approved Installers

Installation shall be carried out by Kilwaughter Minerals Ltd trained applicators who are registered with NSAI Agrément.

2.4.2 General

Kilwaughter Minerals Ltd prepare a site package for each project, in accordance with the NSAI Agrément ETICS Approval Scheme. Deviations must be approved by a Kilwaughter Minerals Ltd technical representative. Kilwaughter Minerals Ltd technical representatives will visit each site on a regular basis to ensure that work is carried out in accordance with the project specific site package, including the Certificate holder's installation manual. Certificates of Compliance, Kilwaughter Minerals Ltd guarantee and home owner's manual will be issued on successful completion and sign-off of completed projects.

Mineral wool batts, lamella fire stop and phenolic boards must be protected from moisture prior to and during installation. It may be necessary to remove and replace any unsuitable/wet material. External works that leave the external appearance of the building inconsistent with neighbouring buildings may require planning permission. The status of this requirement should be checked with the local planning authority as required.

Details shown in this Certificate were developed to strike a balance between thermal efficiency and economic viability. To maximise thermal performance, reference should be made to the requirements of Section 2 of the Acceptable Construction Details document (ACD).

2.4.3 Site Survey and Preliminary Work

A comprehensive pre-installation site survey of the property shall be carried out in accordance with the NSAI Agrément ETICS Approval Scheme.

The substrate must be free of water repellents, dust, dirt, efflorescence and other harmful contaminants or materials that may interfere with the adhesive bond. Remove projecting mortar or concrete parts mechanically as required. Where the substrate contains dash, it must be levelled as much as possible with a layer of adhesive base coat prior to the application of the insulation boards/batts.

Where discrepancies exist preventing installation of the system in accordance with this Certificate and the Certificate holder's instructions, these discrepancies must be discussed with the Certificate holder and a solution implemented with the approval of the Certificate holder.

2.4.4 Procedure

The systems must be installed in accordance with the Certificate holder's instructions. Key points include:

- Weather conditions must be monitored to ensure correct application and curing conditions. Renders (adhesives, base coats, primers, finish coats) must not be applied if the temperature is below 5°C or above 25°C at

the time of applications. In addition, cementitious-based renders must not be applied if the temperature will be below 0°C at any time during 72 hours after application; cement-free, synthetic-resin and silicone-resin plasters must not be applied if the temperature will be below 5°C at any time during 72 hours after application; silicate plasters must not be applied if the temperature will be below 8°C at any time during 72 hours after application.

- Until fully cured, the coatings must be protected from rapid drying, precipitation, direct sunlight and strong wind. The coatings must also be protected against freeze-thaw for 24 hours after application.
- To avoid thermal bridging, ensure a tight adhesive free joint connection between adjacent insulation boards. Foam filler approved by the Certificate holder may be used for filling gaps up to 5mm. Larger gaps should be avoided, where larger gaps greater than 5mm cannot be practically avoided these gaps shall be filled with ETICS insulation material cut to size and sufficiently fixed to substrate.
- Window and door reveals should, where practicable, be insulated to minimise the effects of cold bridging in accordance with the recommendations of the Acceptable Construction Details Document published by the DHPLG, Detail 2.21, to achieve a minimum R-value of 0.6m²K/W. Ideally windows should be moved forward to the plane of the external insulation to limit the effects of thermal bridging at the reveal. Where clearance is limited, strips of approved insulation should be installed to suit available margins and details recorded as detailed in Section 4.5 of this Certificate.
- Refer to the Certificate holder's instructions and the project specific site package regarding the installation method and location of the SS fixings through the reinforcing mesh where fire stops have been installed. Additional layers of mesh are also applied at these locations. Stainless steel fire fixings to be provided at a rate of one per square metre above two stories. The fixing design should take account of the extra duty required under fire conditions.
- Purpose-made powder coated aluminium window sills are installed in accordance with the Certificate holder's instructions. These sills incorporate an insulation board fixed between them and the existing sill to limit the effects of thermal bridging. They are designed to prevent water ingress and incorporate drips to shed water clear of the system.
- All necessary post-application inspections should be performed and the homeowner's manual completed and handed over to the homeowner accordingly.

Specific Instructions for New Build (K Systems E and M Systems only) and for K Systems P Systems

- After the boards are initially fixed to the wall, a thickness of 3mm of a basecoat should be applied to the surface of the insulation using a stainless steel trowel or render pump.
- The reinforcing mesh should be embedded in the wet basecoat using the trowel, and joints should be overlapped by a minimum of 100 mm, pieces of diagonal mesh patches of approximately 300 by 200 mm should also be installed at the corners of window/door openings.
- It is important to ensure that the reinforcing mesh is free of wrinkles and completely covered, and the required minimum thickness of basecoat is achieved.
- Once the mesh is fully imbedded in the first layer of basecoat, holes are drilled through the reinforcing mesh and boards into the substrate wall to the required depth at the specified frequency, and in a regular pattern of six to eight fixings per square metre. The mechanical fixings are inserted and tapped or screwed firmly into place, securing the reinforcing mesh and boards to the substrate wall. The fixings are slightly overdriven such that a small depression is created in the render. This can be done immediately while the render is still wet or later when the render has set.
- Stress patches of reinforcing mesh of 150 by 150mm mesh are applied over the mechanical fixing heads and fully embedded within the basecoat while it is still wet, or alternatively a second layer of mesh can be blanket applied over the fixings and bedded in with the basecoat. Further basecoat is applied to maintain approximately 6mm thickness when measured from top of the fixings. The surface of the basecoat should be given a light diagonal scratch to provide a key for the dash receiver coat. If the building exceeds two storeys, stainless steel fire fixings should then be installed using a pattern that achieves a minimum of 1 fixing per 1m².
- The system is finished against a stainless steel stop bead at reveals to allow for replacement of windows.
- The first (mortar) layer should be applied to the surface of the base coat using a hawk and trowel, or projection render machine, to a thickness of 6 to 8mm and ruled off to a flat finish. Care should be taken not to over-trowel, polish the surface, or apply water during the setting time.
- After the mortar layer has started to stiffen, the second layer (brick face) is applied to an average thickness of 3 to 5mm (again, using a hawk and trowel or projection render machine). It must not be applied if the mortar layer has been allowed to dry and/or set.
- To achieve a textured surface finish, an appropriate tool (stiff brush, comb, sponge, spatula or other implement) can be used as required. The skill of the operator will determine the finish.
- After the face layer has been shaded and textured, it should be cut out to the required pattern. The cutting should be delayed until the initial stiffening of the applied materials has occurred. The face layer is cut through completely and the mortar layer is cut into slightly, using an appropriate cutting tool. This reproduces recessed mortar coursing of the brickwork or stonework, as required. Spirit levels, templates and straight edges should be used for guiding this operation.
- Following further stiffening of the materials, any face materials left by the cutting out should be removed using a soft bristled brush.
- At the tops of the walls, the system must be protected by an adequately sealed, purpose-made flashing.
- Care should be taken in the detail of the system around openings and projections. To achieve a 60-year service life, the system is finished against a stainless steel stop bead at reveals, to allow for replacement of windows.

Specific Instructions for K Rend Brick Rend (K Systems E System only)

- Before applying K Rend Brick Rend, all windows, doors, gas meter boxes and any other feature/service penetration should be sealed with a low modulus silicone sealant.
- K Rend Brick Rend should be mixed with 5 to 6 litres of potable water per 25kg bag for a minimum of 5 minutes with an electric paddle mixer to disperse the additives using a drill with a suitable paddle or whisk prior to application.

	Components	Thickness (mm)
Adhesives	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	
Insulation	<ul style="list-style-type: none"> • EPS: EPS 70E (enhanced expanded polystyrene) board, 1200mm x 600mm, nominal density of 17kg/m³, minimum compressive strength of 70kN/m², nominal tensile strength perpendicular to the face of 100kPa, Class E (flame retardant) material to IS EN 13163:2012+A2:2016^[7]. 	40 to 200
Plinth Insulation	<ul style="list-style-type: none"> • XPS XPS 300/500/700 (extruded polystyrene), 2500mm x 600mm, nominal density of 30/35/45kg/m³, compressive strength or 300/500/700kN/m² 	30 to 150
Anchors	<ul style="list-style-type: none"> • Ejotharm NT U High density polyethylene (HDPE) anchor sleeve with steel galvanized centre pin • Ejotharm STR U HDPE anchor sleeve and polystyrene anchor cap with steel galvanized centre pin <p>Alternative fixings can be used if they had equal or higher pull-out, plate diameter and plate stiffness characteristics.</p>	
Base coat	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	4 to 6mm
Reinforcement mesh	<ul style="list-style-type: none"> • Reinforcing Mesh Alkali resistant glass fibre mesh in 50m x 1m rolls, 3.5mm x 3.5mm mesh size, organic content of 20%, PCS value of 8.17MJ/kg, nominal weight of 160g/m² 	
Primer	<ul style="list-style-type: none"> • K Rend Primer TC (K Systems E Acrylic System and K Systems E Silicone System only) Available in a range of various colours to suit the colour of finish used 	
Finish coat	<ul style="list-style-type: none"> • K Rend Standard Dash Receiver (K Systems E Dash System only) Cement based polymer modified render available in a range of colours 	6 to 10mm
	<ul style="list-style-type: none"> • Dry Dash (K Systems E Dash System Only) Aggregates up to 8mm and available in a range of colours 	4 to 8mm
	<ul style="list-style-type: none"> • K Rend Acrylic TC (K Systems E Acrylic System only) Decorative topcoat in 15 and 30 grades and in a range of colours 	
	<ul style="list-style-type: none"> • K Rend Brick Rend mortar coat (K Systems E Brick Rend System only) Polymer-modified cementitious grey render mixed with 5 to 6 litres of water per 25kg bag, applied on the basecoat 	6 to 8mm
	<ul style="list-style-type: none"> • K Rend Brick Rend face coat (K Systems E Brick Rend System only) Polymer-modified cementitious red render mixed with 5 to 6 litres of clean water per 25kg bag, applied on the K Rend Brick Rend mortar coat 	3 to 5mm
Note: Products referred to as "K Rend" (e.g. K Rend HP14 Base) may also in some cases be branded as "K Systems" (e.g. K Systems HP14 Base) while the products are being re-branded.		

Table 1a: Component Specification – K Systems E Systems

	Components	Thickness (mm)
Adhesives	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	
Insulation	<ul style="list-style-type: none"> • Phenolic: K5 EWB Grade CFC/HCFC-free to IS EN 13166^[9] Density 40kg/m³; minimum compressive strength 150kN/m², minimum tensile strength 50kN/m² 	40 to 120
Plinth Insulation	<ul style="list-style-type: none"> • XPS XPS 300/500/700 (extruded polystyrene), 2500mm x 600mm, nominal density of 30/35/45kg/m³, compressive strength or 300/500/700kN/m² 	30 to 150
Anchors	<ul style="list-style-type: none"> • Ejotherm NT U High density polyethylene (HDPE) anchor sleeve with steel galvanized centre pin • Ejotherm STR U HDPE anchor sleeve and polystyrene anchor cap with steel galvanized centre pin <p>Alternative fixings can be used if they had equal or higher pull-out, plate diameter and plate stiffness characteristics.</p>	
Base coat	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	4 to 6mm
Reinforcement mesh	<ul style="list-style-type: none"> • Reinforcing Mesh Alkali resistant glass fibre mesh in 50m x 1m rolls, 3.5mm x 3.5mm mesh size, organic content of 20%, PCS value of 8.17MJ/kg, nominal weight of 160g/m² 	
Primer	<ul style="list-style-type: none"> • K Rend Primer TC (K Systems P Acrylic System and K Systems P Silicone System only) • Available in a range of various colours to suit the colour of finish used 	
Finish coat	<ul style="list-style-type: none"> • K Rend Standard Dash Receiver (K Systems P Dash System only) Cement based polymer modified render available in a range of colours • Dry Dash (K Systems P Dash System only) Aggregates up to 8mm and available in a range of colours • K Rend Acrylic TC (K Systems P Acrylic System only) Decorative topcoat in 15 and 30 grades and in a range of colours • K Rend Silicone TC (K Systems P Silicone System only) Decorative topcoat in 15 and 30 grades and in a range of colours 	6 to 10mm 4 to 8mm
Note: Products referred to as "K Rend" (e.g. K Rend HP14 Base) may also in some cases be branded as "K Systems" (e.g. K Systems HP14 Base) while the products are being re-branded.		

Table 1b: Component Specification – K Systems P Systems

	Components	Thickness (mm)
Adhesives	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	
Insulation	<ul style="list-style-type: none"> • Mineral Wool: • LD Mineral wool insulation slab Mineral wool insulation, 1200mm x 600mm, nominal density of 105kg/m³, minimum tensile strength of 10kN/m², slabs comply with the requirements of IS EN 13162^[10]. 	40 to 260
	<ul style="list-style-type: none"> • DD Mineral wool insulation slab Mineral wool insulation, 1200mm x 600mm, average density of 110kg/m³, minimum tensile strength of 10kN/m², slabs comply with the requirements of IS EN 13162^[10]. 	50 to 200
Plinth Insulation	<ul style="list-style-type: none"> • XPS XPS 300/500/700 (extruded polystyrene), 2500mm x 600mm, nominal density of 30/35/45kg/m³, compressive strength or 300/500/700kN/m² 	30 to 150
Anchors	<ul style="list-style-type: none"> • Ejotharm NT U High density polyethylene (HDPE) anchor sleeve with steel galvanized centre pin • Ejotharm STR U HDPE anchor sleeve and polystyrene anchor cap with steel galvanized centre pin <p>Alternative fixings can be used if they had equal or higher pull-out, plate diameter and plate stiffness characteristics.</p>	
Base coat	<ul style="list-style-type: none"> • K Rend HP14 Base Cement based polymer modified powder requiring addition of water 	4 to 6mm
Reinforcement mesh	<ul style="list-style-type: none"> • Reinforcing Mesh Alkali resistant glass fibre mesh in 50m x 1m rolls, 3.5mm x 3.5mm mesh size, organic content of 20%, PCS value of 8.17MJ/kg, nominal weight of 160g/m² 	
Primer	<ul style="list-style-type: none"> • K Rend Primer TC (K Systems M Silicone System only) Available in a range of various colours to suit the colour of finish used 	
Finish coat	<ul style="list-style-type: none"> • K Rend Silicone TC (K Systems M Silicone System only) Decorative topcoat in 15 and 30 grades and in a range of colours • K Rend Standard Dash Receiver (K Systems M Dash System only) Cement based polymer modified render available in a range of colours • Dry Dash (K Systems M Dash System only) Aggregates up to 8mm and available in a range of colours 	
Note: Products referred to as "K Rend" (e.g. K Rend HP14 Base) may also in some cases be branded as "K Systems" (e.g. K Systems HP14 Base) while the products are being re-branded.		

Table 1c: Component Specification – K Systems M Systems

Note: EPS insulation is shown in the following details for illustrative purposes only. Full installation details for mineral wool and phenolic insulation can be obtained from the certificate holder.

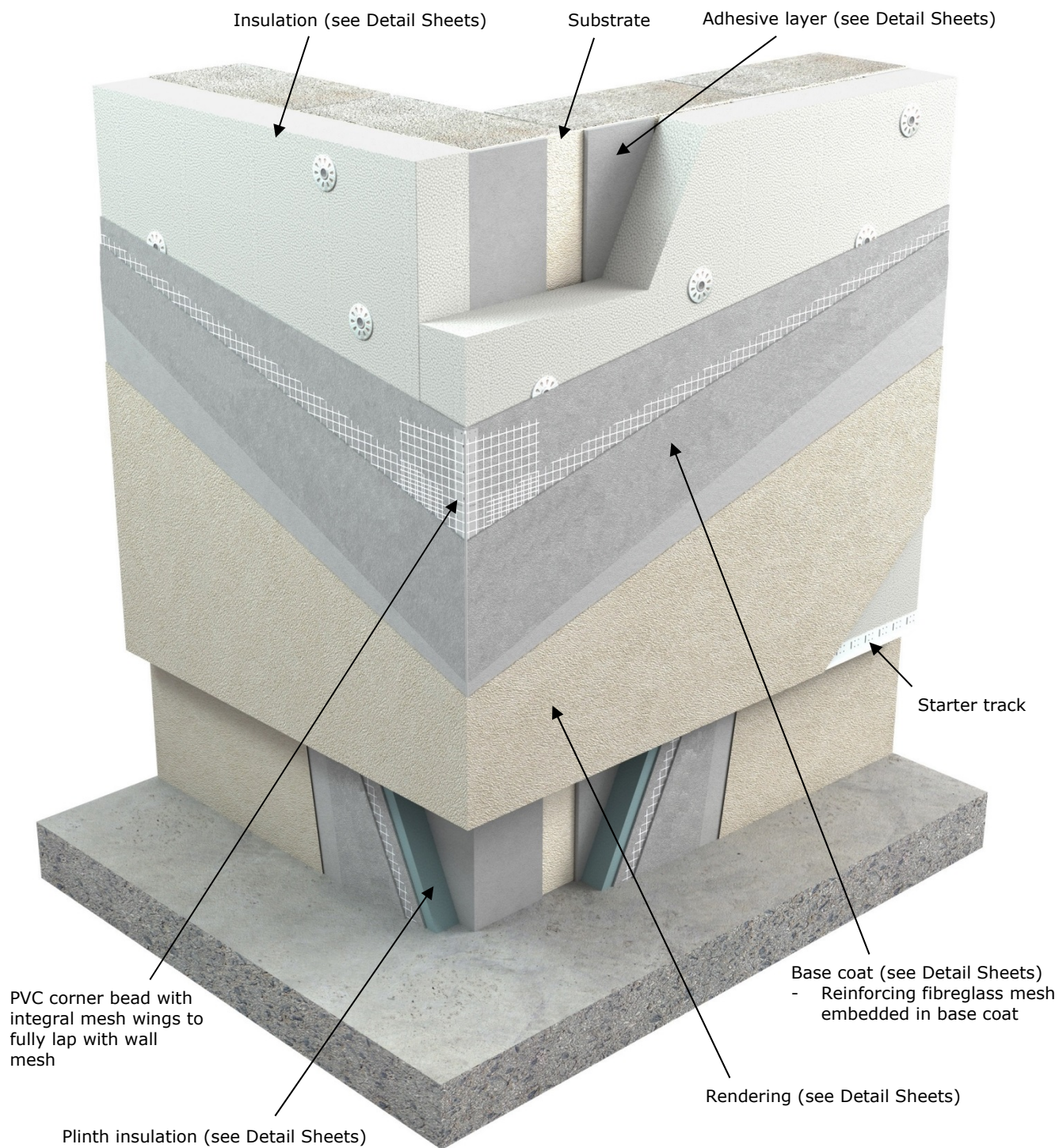


Figure 1: Build-up of System Components

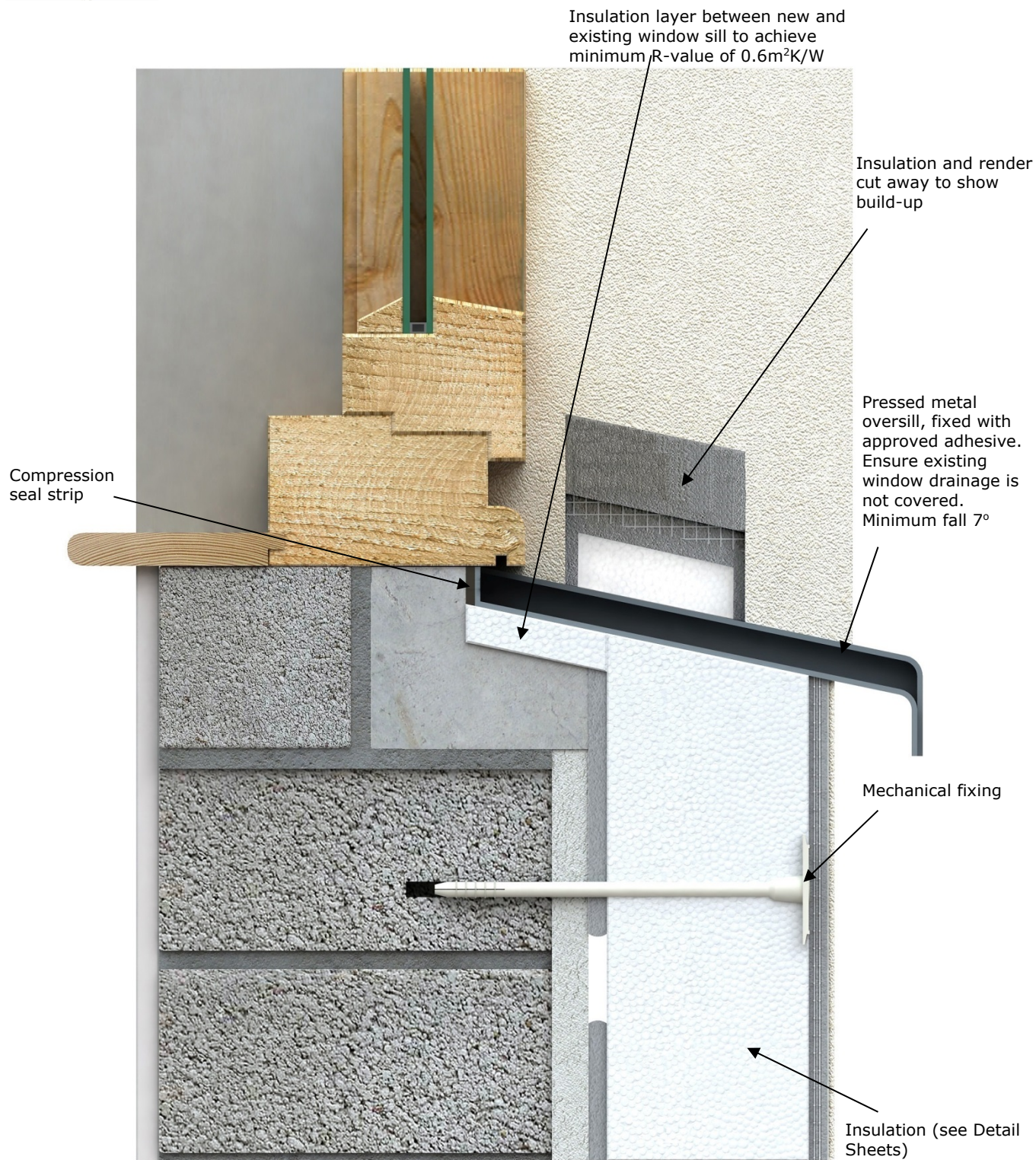


Figure 2: Window Sill Detail

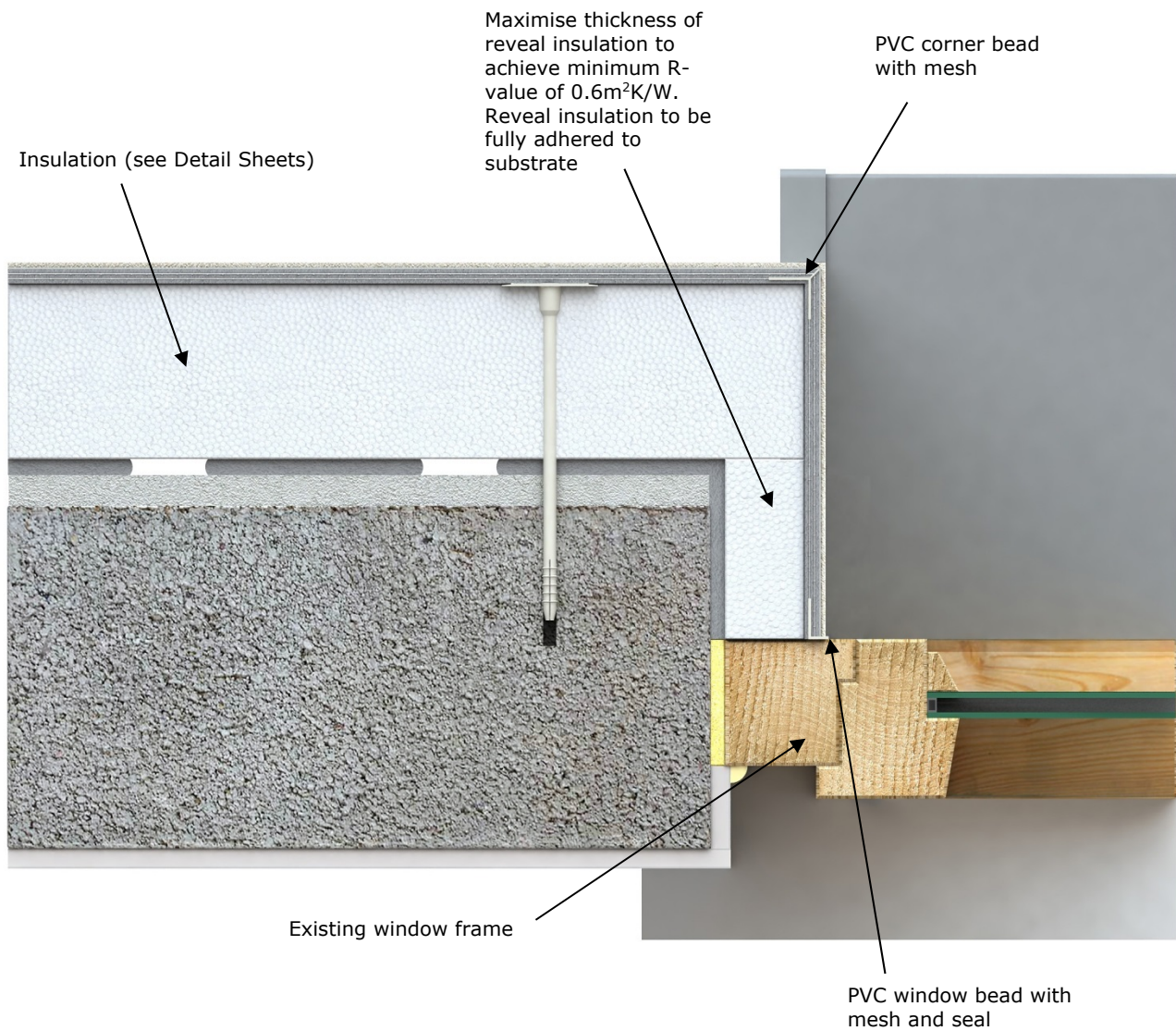


Figure 3: Window Reveal Detail

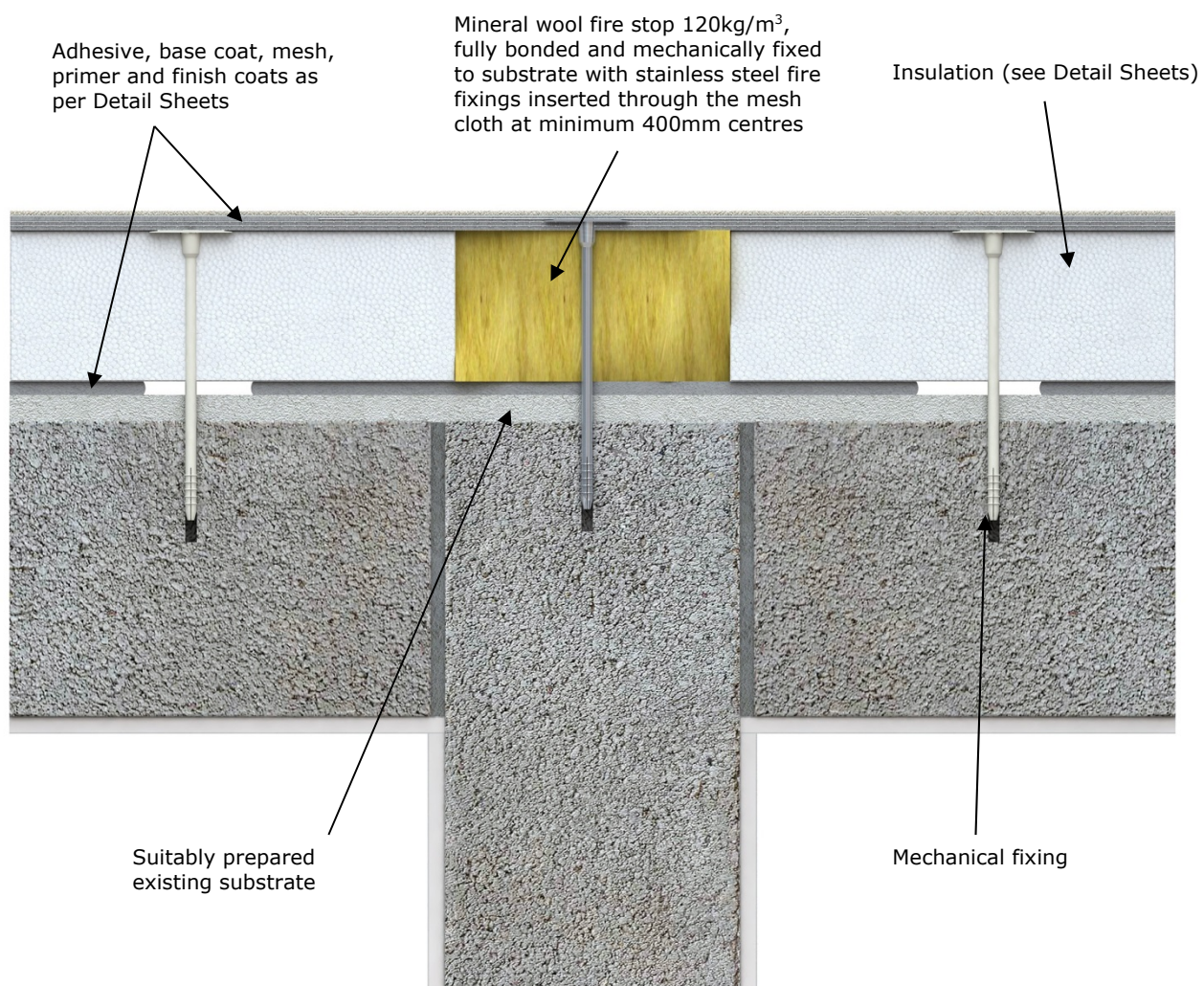


Figure 4: Fire Break Detail

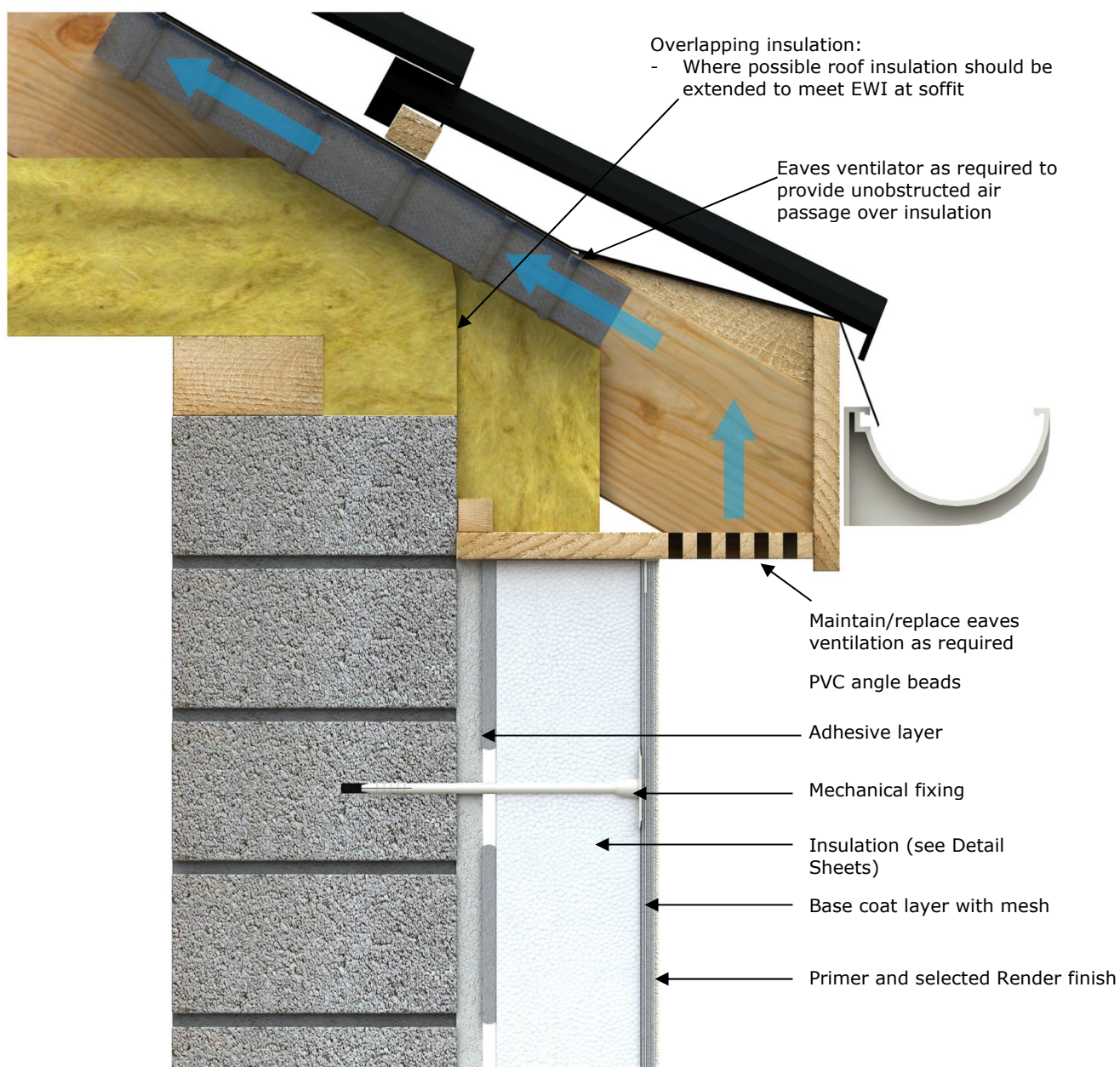


Figure 5: Eaves Detail

3. GENERAL

The systems are designed by Kilwaughter Minerals Ltd on a project specific basis. Where the external insulation system is being applied to improve the thermal performance of an existing building, Kilwaughter Minerals Ltd will assess the building and advise on how to maximise the benefits of the external insulation system for that building. The design will include for:

- a) The completion and recording of a site survey. For existing buildings, U-value calculations, pull-out resistance etc. should be based on the existing structure.
- b) Evaluation and preparation of substrate.
- c) Minimising risk of condensation in accordance with the recommendations of BS 5250^[3]. This includes the use of approved detailing as shown in Figures 1 to 5 incorporating the requirements of SR 54^[4] and, where possible, the Acceptable Construction Details published by DHPLG.
- d) Thermal insulation provision to Part L of the Building Regulations 1997 to 2019.
- e) Resistance to impact and abrasion.
- f) Resistance to thermal stresses.
- g) Resistance to wind loading.
- h) Design of fixings to withstand design wind loadings, using a safety factor of 2.5 (two and a half) for mechanical fixings and a safety factor of 9 (nine) for adhesive. In addition, fixings around window and door openings shall be at a maximum of 300mm centres in each board or section of board so as to provide positive and robust restraint over the life of the system.
- i) The design for wind loading on buildings greater than 2 stories should be checked by a competent trained person in accordance with Eurocode 1 I.S. EN 1991-1-4^[5].
- j) Design for fire resistance, fire spread and fire stopping, as defined in Section 4.2 and 4.3 of this Certificate.
- k) Design of a water management system to prevent ingress of water at movement joints, windows, doors, openings for services etc. Particular attention is required to ensure that window and sill design are coordinated to achieve a fully integrated design.
- l) Movement joints.
- m) A site specific maintenance programme for inclusion in the home owner's documentation.
- n) Durability requirements.

Detailing and construction must be to a high standard to prevent the ingress of water and to achieve the design thermal performance. Window details should be designed such that, where

possible, they can be removed and replaced from within the building, with best practice being to move the windows forward. Consideration should be given to maximising improvement of thermal insulation at window reveals, door openings etc. Adequate provision should be made at design and installation stage for the release of trapped moisture e.g. above window heads.

When designed and installed in accordance with this Certificate, the system will satisfy the wall elemental U-value and linear thermal transmittance requirements of Part L of the Building Regulations 1997 to 2019. The design shall include for the elimination/minimising of cold bridging at window and door reveals, eaves and at ground floor level in compliance with Acceptable Construction Details published by DHPLG.

The system is intended to improve the weather resistance of the external walls. Seals to windows and doors shall be provided in accordance with the project specific site plan and the Acceptable Construction Details. Care should be taken to ensure that any ventilation or drainage openings are not obstructed.

In areas where electric cables can come into contact with EPS, in accordance with good practice all PVC sheathed cables should be run through ducting or be re-routed. Domestic gas installations must not be adversely affected by the fitting of external insulation. If the external insulation has an impact on the gas service line/meter location, then Bord Gáis Networks must be contacted so that a suitable solution can be achieved. If altering a gas installation, a Registered Gas Installer (RGI) must be employed.

The durability of the render systems is influenced by the colour of the render used. Further information is available by contacting the Certificate holder.

In locations where frost heave is likely to occur, plinth XPS must be kept 10mm above ground level.

3.2 MAJOR RENOVATION

As external insulation over 25% of the building envelope is classified as Major Renovation in TGD to Part L of the Building Regulations 1997 to 2019, attention should be paid to Section 2.3 of TGD to Part L 2019 where external insulation is undertaken as part of a deep retrofit installation.

4.1 STRENGTH AND STABILITY

4.1.1 Wind Loading

K Systems External Wall Insulation Systems can be designed to withstand the wind pressures (including suction) and thermal stresses in accordance with the Building Regulations 1997 to 2019. The design for wind loading on buildings greater than two stories should be checked by a competent trained person in accordance with Eurocode 1 I.S. EN 1991-1-4^[5]. A general factor of safety of 1.5 is applied to design wind loads.

4.1.2 Impact Resistance

a) The K Systems External Wall Insulation Systems have been classified as defined in each individual Detail Sheet to be suitable for use as defined in ETAG 004^[1] Cl. 6.1.3.3 Table 8 as follows (see Table 2 for impact resistance classification achieved):

Category I: A zone readily accessible at ground level to the public and vulnerable to hard impacts but not subject to abnormally rough use.

Category II: A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.

Category III: A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

Note: The above classifications do not include acts of vandalism.

In an Irish context, Category II excludes any wall at ground level adjacent to a public footpath but includes one with its own private, walled-in garden. Category III excludes all walls at ground level.

b) The design should include for preventing damage from impact by motor vehicles or other machinery. Preventive measures such as provision of protective barriers or kerbs should be considered.

System	Impact Category
K Systems E Dash	I
K Systems E Acrylic	II
K Systems P Dash	I
K Systems P Acrylic	II
K Systems M Silicone	II
K Systems M Dash	I
K Systems P Silicone	II
K Systems E Brick Rend	I
K Systems E Silicone	II

Table 2: Impact Resistance

4.2 BEHAVIOUR IN RELATION TO FIRE

The reaction to fire classification according to IS EN 13501-1^[6] for the K Systems External Wall Insulation Systems are as follows:

- K Systems E Systems: B-s1, d0
- K Systems P Systems: B-s1, d0
- K Systems M Systems: A2-s1, d0

Systems that achieve a Class A2 or B Reaction to Fire Classification are suitable for use up to a maximum of six storeys (18m) in height on purpose groups 1(a), 1(c), 1(d), 2(a), 2(b), 3, 4(a) and 4(b), and for use up to a maximum of five storeys (15m) in height on purpose group 1(b), as defined in TGD to Part B of the Building Regulations 1997 to 2019.

The mineral wool board is classified as non-combustible as per Table A8 (d) of TGD to Part B of the Building Regulations 1997 to 2019.

With regard to fire stopping and limitations on use of combustible materials, walls must comply with Sections 3.2, 3.3, 3.4 and 4 of TGD to Part B of the Building Regulations 1997 to 2019, and Sections 3.5, 3.6, 3.7 and 4 of TGD to Part B Volume 2 of the Building Regulations 1997 to 2019. Stainless steel fire fixings must be provided at the rate of one per square metre when specified. The fixing design should take account of the extra duty required under fire conditions.

Vertical and horizontal lamella fire barriers shall be provided at each compartment floor and wall, with stainless steel fixings provided at 300mm vertical centres and 300mm horizontal centres respectively, including the second floor level of a three-storey single occupancy house (see Diagram 12 of TGD to Part B Volume 2 of the Building Regulations 1997 to 2019). Firebreaks should be fully adhesively bonded to the substrate (i.e. ribbons or dabs of adhesive are not acceptable) and mechanically fixed with stainless steel fire fixings at 400mm centres. The fire barrier shall be of non-combustible material (i.e. lamella, slab of minimum density 120kg/m³), be at least 200mm high, continuous and unbroken for the full perimeter of the building and for the full thickness of the insulation. Glass wool is not suitable for use as a firestop (see Clause 3.6.3 of TGD to Part B Volume 2 of the Building Regulations 1997 to 2019 for types of suitable firestop). In multi-storey applications, at least one 8mm diameter stainless steel fixing (in addition to those of plastics) per square metre of insulation is required. The anchor is applied to prevent collapse should the insulation be lost to fire and must be designed to resist the bending

and shear stresses resulting from the dead load from the render.

4.3 PROXIMITY OF HEAT PRODUCING APPLIANCES

Combustible material must be separated from a brick or blockwork chimney by at least 200mm from a flue and 40mm from the outer surface of the brick or blockwork chimney, in accordance with Clause 2.5.6 of TGD to Part J of the Building Regulations 1997 to 2019. Metal fixings in contact with combustible materials should be at least 50mm from a flue.

4.4 THERMAL INSULATION

Assessments were carried out to verify that the requirements of Part L of the Building Regulations 1997 to 2019 can be achieved using the K Systems External Wall Insulation Systems. The manufacturer's declared thermal conductivity values ($\lambda_{90/90}$) taken from their CE Marking Declarations of Performance are as follows:

- EPS: 0.032W/mK
- Phenolic: 0.021W/mK for 25-44mm thickness and 0.020W/mK for greater than 45mm thickness
- Mineral Wool: 0.036W/mK

These have not been assessed by NSAI Agrément. Table 3 shows typical insulation thicknesses to achieve minimum U-values of 0.27W/m²K (retrofit only) and 0.21W/m²K for different construction types.

Calculation of U-values will be required on individual projects to confirm a U-value of 0.27W/m²K or better has been achieved, based on the wall construction and the insulation used. The thermal conductivity (λ) value of the insulation to be used in all U-value calculations must be the $\lambda_{90/90}$ value.

When the system is to be applied to a masonry cavity wall, consideration should be given to the treatment of the ventilated cavity. In order to ensure the thermal effectiveness of the external insulation system, it is critical to eliminate airflow within the cavity void. It is essential to seal the cavity to achieve an unventilated air layer. This eliminates heat losses due to airflow within the cavity circumventing the ETIC system. Best practice is to fill the cavity void with an NSAI Agrément approved Cavity Wall Insulation (CWI) system. Ventilation to the building must be maintained in accordance with the requirements of TGD to Part F of the Building Regulations 1997 to 2019.

4.5 LIMITING THERMAL BRIDGING

The linear thermal transmittance ' ψ ' (Psi) describes the heat loss associated with junctions and around openings. Window and door reveal design used on the K Systems External Wall

Insulation Systems have been assessed and when detailed in accordance with this Certificate can meet the requirements of Table D2 of TGD to Part L of the Building Regulations 1997 to 2019.

When **all** bridged junctions within a building comply with the requirements of Table D2 of TGD to Part L, the improved 'y' factor of 0.08 can be entered into the DEAP building energy rating (BER) calculation. If **all** junctions can be shown to be equivalent or better than Acceptable Construction Details published by the DHPLG, then the values published in Table D2 apply.

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 by an NSAI approved thermal modeller.

As per Acceptable Construction Details, a minimum thermal resistance of 0.6m²K/W should be provided at window reveals, heads and sills.

4.6 CONDENSATION RISK

Areas where there is a significant risk of condensation due to high levels of humidity should be identified during the initial site survey.

4.6.1 Internal Surface Condensation

When improving the thermal performance of the external envelope of a building through external wall insulation, designers need to consider the impact of these improvements on other untouched elements of the building. As discussed in Section 4.5 of this Certificate, thermally bridged sections of the envelope such as window jambs, sills and eaves will experience a lower level of increased thermal performance. The degree of improvement to these junctions can be limited due to physical restrictions on site i.e. footpaths, soffit boards or hinges for windows.

When bridged junctions meet the requirements of Appendix D Table D2 of TGD to Part L of the Building Regulations 1997 to 2019, the coldest internal surface temperature will satisfy the requirements of Section D2, namely that the temperature factor shall be equal to or greater than 0.75. As a result, best practice will have to be adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth.

When site limiting factors give rise to substandard levels of insulation at bridged junctions, guidance should be sought from the Certificate holder as to acceptable minimum requirements.

4.6.2 Interstitial Condensation

An interstitial condensation risk analysis will be carried out by Kilwaughter Minerals Ltd in accordance with BS 5250^[3] and the design modified as appropriate to reduce the risk of interstitial condensation to acceptable levels. Table 4 lists the s_d values for a range of build-ups.

4.6.3 Ventilation

When installing the external insulation system, the works to be undertaken must not compromise the existing ventilation provisions in the home, including the ventilation of suspended timber floors, where existing vents must be sleeved across the rising wall and sealed.

When these existing ventilation provisions do not meet the requirements of Part F of the Building Regulations 1997 to 2019, the homeowner should be informed and remedial action must be taken before the external insulation system is installed.

4.7 MAINTENANCE

Adequate provision should be made in the initial design phase for access and maintenance over the life of the system. A detailed maintenance plan must be prepared and provided to the building manager/owner on completion. As a minimum this should include an inspection for evidence of defects 12 months after the application and subsequently every 5 years.

The system shall be inspected and maintained in accordance with the Certificate holder's instructions, as detailed in the Repair and Maintenance Method Statement, which is incorporated into the Building Owner's Manual.

Necessary repairs should be carried out immediately and must be in accordance with the Certificate holder's instructions. Repairs to plumbing etc. should also be carried out as required to prevent deterioration or damage, and to protect the integrity of the system.

Synthetic finishes may be subject to aesthetic deterioration due to exposure to UV light. They should be re-painted every 18 to 20 years to maintain appearance. Care should be taken to ensure that the synthetic finish used is compatible with the original system and that the water vapour transmission or fire characteristics are not adversely affected.

Sealants shall be subject to regular inspection (at least annually). They should be replaced as required and fully replaced every 18 to 20 years to maintain performance.

4.7.1 Maintenance for New Build Construction (K Systems E and M Systems only)

For new build construction, a detailed maintenance plan must be prepared and provided to the building manager/owner on completion. As a minimum, this should include an inspection for evidence of defects twelve months after the application and subsequently every five years.

4.8 WEATHERTIGHTNESS

When designed and detailed in accordance with this Certificate, the system will prevent moisture from the ground coming in contact with the insulation. The external render has adequate resistance to water penetration when applied in accordance with the Certificate holder's instructions.

Joint designs, sealant specifications and recommendations for detailing at windows and doors were assessed and are considered adequate to ensure that water penetration will not occur, assuming that regular maintenance is carried out in accordance with the Certificate holder's instructions.

4.9 DURABILITY

4.9.1 Design Life

An assessment of the life of the system was carried out. This included an assessment of:

- Design and installation controls;
- Proposed building heights;
- Render thickness and specification;
- Material specifications, including insulant, mesh, beading and fixing specifications;
- Joint design;
- Construction details;
- Maintenance requirements.

The systems can last in excess of 30 years subject to normal use, regular inspection and maintenance. It is important to note that the durability of the render system is entirely dependent on the correct installation of the product in accordance with this Certificate, the manufacturer's instructions, IS EN 13914-1^[2] and ongoing care and maintenance as described in Section 4.7 of this Certificate. Critical details include rendering at window sills, raised features, junctions with eaves and verges, and the use of suitably designed overhangs and flashings. Reference should be made to IS EN 13914-1^[2] for general advice on design, in particular on the use of angle, stop and movement joint beads.

Design Life for New Build Construction (K Systems E and M Systems only)

The design life of the K Systems E and M Systems can be extended for 60 years for new build construction provided the system is fixed through the reinforcement mesh and a planned inspection and maintenance programme is introduced in

accordance with Section 4.7.1. It requires the use of stainless steel base and corner profiles, stainless steel centre pin fixings (304 Grade 1.4301) and plastic anchor sleeve materials such as polyamide (PA6 and PA6.6), polythene (PE) or polypropylene (PP) and following an appropriate repair and maintenance schedule as covered by the Certificate holder's repair and maintenance manual. Any damage to the surface finish must be repaired within a time period agreed by the Certificate holder.

4.9.2 Aesthetic Performance

As with traditional renders, the aesthetic performance of the systems, e.g. due to discolouration, soiling, staining, algal growth or lime bloom, is depended on a range of factors such as:

- Type, colour and texture of surface finish;
- Water retaining properties of the finish;
- Architectural form and detailing;
- Building orientation/elevation;
- Local climate/atmospheric pollution.

The render may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discolouration by algae and lichens may occur in wet areas. The appear may be restored by a suitable power wash. Where cleaning of walls is required, the procedure in the K Systems Maintenance document must be followed which contains detailed information on the removal of algae. It is the homeowner's responsibility to inspect the walls every year and clean when required; however the homeowner may contract the approved installer to provide this service.

Adequate consideration should be given at the design stage to all of the above to ensure that the level of maintenance necessary to preserve the aesthetics of the building is acceptable.

4.10 PRACTICABILITY

The practicability of construction and the adequacy of site supervision arrangements were assessed and considered adequate. The project specific designs and method statements for application, inspection and repair were reviewed and found to be satisfactory.

4.11 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING

- Structural strength and stability
- Behaviour in fire
- Impact resistance
- Pull-out resistance of fixings
- Thermal resistance
- Hygrothermal behaviour
- Condensation risk

- Site erection controls
- Durability of components
- Dimensional stability of insulants

4.12 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) Special building details (e.g. ground level, window and door openings, window sill and movement joints) were assessed and approved for use in conjunction with this Certificate.
- (iv) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

K Systems E Systems		
Thickness of Insulation (mm)		
U-value (W/m ² K)	215mm brickwork ($\lambda = 0.56\text{W/mK}$)	200mm dense blockwork ($\lambda = 1.75\text{W/mK}$)
0.18	170	180
0.19	160	170
0.25	120	130
0.26	110	120
(1) Wall construction inclusive of 13mm plaster ($\lambda = 0.57\text{W/mK}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88\text{W/mK}$). (2) Calculation based on a system that included 7 stainless steel fixings per square metre, with 8mm diameter sleeve and a point thermal transmittance of 0.002W/K per pin. Use of other types of fixings should be calculated in accordance with IS EN ISO 6946 ^[8] . (3) Based upon incremental insulation thickness of 10mm. (4) When applying the maximum available insulation thickness, these walls can achieve U-values of 0.16 to 0.17W/m ² K depending on wall type.		
K Systems P Systems		
Thickness of Insulation (mm)		
U-value (W/m ² K)	215mm brickwork ($\lambda = 0.56\text{W/mK}$)	200mm dense blockwork ($\lambda = 1.75\text{W/mK}$)
0.18	110	120
0.19	100	110
0.25	80	80
0.26	70	80
(1) Wall construction inclusive of 13mm plaster ($\lambda = 0.57\text{W/mK}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88\text{W/mK}$). An adhesive layer of 5mm thick with $\lambda = 1.0\text{W/mK}$ covering 100% of the area is also included and a board emissivity of 0.9, together with an external render thickness of 7.5mm with $\lambda = 1\text{W/mK}$. (2) Calculation based on a system that included 7 stainless steel fixings per square metre, with 8mm diameter sleeve and a point thermal transmittance of 0.002W/K per pin. Use of other types of fixings should be calculated in accordance with IS EN ISO 6946 ^[8] . (3) Based upon incremental insulation thickness of 10mm. (4) When applying the maximum available insulation thickness, these walls can achieve U-values of 0.17W/m ² K depending on wall type.		
K Systems M Systems		
Thickness of Insulation (mm)		
U-value (W/m ² K)	215mm brickwork ($\lambda = 0.56\text{W/mK}$)	200mm dense blockwork ($\lambda = 1.75\text{W/mK}$)
0.18	190	200
0.19	180	190
0.25	140	150
0.26	130	140
(1) Wall construction inclusive of 13mm plaster ($\lambda = 0.57\text{W/mK}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88\text{W/mK}$) with an external render thickness of 14mm ($\lambda = 1.0\text{W/mK}$). (2) Calculation based on a system that included 7 stainless steel fixings per square metre, with 8mm diameter sleeve and a point thermal transmittance of 0.002W/K per pin. Use of other types of fixings should be calculated in accordance with IS EN ISO 6946 ^[8] . (3) Based upon incremental insulation thickness of 10mm. (4) When applying the maximum available insulation thickness, these walls can achieve U-values of 0.11 to 0.42W/m ² K depending on wall type.		

Table 3: Typical U-values (W/m²K)

K Systems E Systems			
Layers	Thickness (mm)	S _d	μ
EPS – Grey EPS70	30 to 300	-	20 to 40 ⁽¹⁾
Basecoat + Primer + Finish Coat as indicated below:			
K Rend Standard Dash Receiver + K Rend Dry Dash Aggregate	12	0.23 ⁽²⁾	-
K Rend Acrylic TC	8.5	0.5 ⁽²⁾	
K Rend Brick Rend	19	0.24 ⁽²⁾	
K Rend Silicone TC	8.5	0.33 ⁽²⁾	
⁽¹⁾ It is recommended that the lower figure is used for calculating interstitial condensation risk.			
⁽²⁾ To be determined in each case, but the values here were obtained with 14mm thickness.			
K Systems P Systems			
Layers	Thickness (mm)	S _d	μ
Phenolic – K5 EWB	20 to 200	-	50 ⁽¹⁾
Basecoat + Primer + Finish Coat as indicated below:			
K Rend Standard Dash Receiver + K Rend Dry Dash Aggregate	12	0.23 ⁽²⁾	-
K Rend Acrylic TC	8.5	0.5 ⁽²⁾	
K Rend Silicone TC	8.5	0.33 ⁽²⁾	
⁽¹⁾ It is recommended that the lower figure is used for calculating interstitial condensation risk.			
⁽²⁾ To be determined in each case, but the values here were obtained with 14mm thickness.			
K Systems M Systems			
Layers	Thickness (mm)	S _d	μ
Mineral Wool – MW	40 to 260	-	1
Basecoat + Primer + Finish Coat as indicated below:			
K Rend Silicone TC	8.5	0.33	-
K Rend Standard Dash Receiver + K Rend Dry Dash Aggregate	12	0.23 ⁽¹⁾	-
⁽¹⁾ To be determined in each case, but the values here were obtained with 14mm thickness.			

Table 4: Water Vapour Resistance Factor and Equivalent Air Layer Thickness

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 2019 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 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.

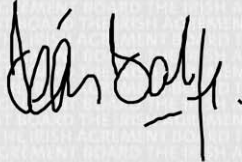
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is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

NSAI Agrément

This Certificate No. **18/0399** is accordingly granted by the NSAI to **Kilwaughter Minerals Ltd** on behalf of NSAI Agrément.

Date of Issue: **April 3rd 2020**

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

Bibliography

- [1] ETAG 004 Edition 2000 Amended August 2011 Amended February 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering.*
- [2] IS EN 13914-1:2016 Design, preparation and application of external rendering and internal plastering – External rendering.
- [3] BS 5250:2016 Code of practice for control of condensation in buildings.
- [4] SR 54:2014 Code of practice for the energy efficient retrofit of dwellings.
- [5] Eurocode 1 I.S. EN 1991-1-4:2005 Actions on structures – General actions – Wind actions.
- [6] IS EN 13501-1:2007 Fire classification of construction products and building elements – Classification using data from reaction to fire tests.
- [7] IS EN 13163:2012+A2:2016 Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification.
- [8] IS EN ISO 6946:2017 Building components and building elements – Thermal resistance and thermal transmittance – Calculation method.
- [9] IS EN 13166:2012+A2:2016 Thermal insulation products for buildings – Factory made phenolic foam (PF) products – Specification.
- [10] IS EN 13162:2012+A1:2015 Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification.