NSAI Agrément

IRISH AGRÉMENT BOARD
CERTIFICATE NO. 15/0381
Farby KABE Polska Sp Z o.o,
Ul.Slaska 88,
PL-40742,
Katowice,
Poland
T: +48 606 793 222
W: www.farbykabe.pl

KABE THERM EPS & MW
External Wall Insulation Systems

Système d'isolation pour murs extérieurs
Wärmedämmung für Außen-wand

NSAI Agrément (Irish Agrément Board) is designated by Government to carry out European Technical Assessments.

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 2023**.

PRODUCT DESCRIPTION:
This Certificate relates to the KABE THERM EPS & MW External Wall Insulation Systems. The systems comprise:

- Surface preparation of masonry or concrete substrate;
- Full system beads and render only beads;
- Insulation boards (standard white EPS, graphite enhanced EPS for KABE THERM EPS System, and mineral wool for KABE THERM MW System);
- Base coat with reinforcement;
- Decorative finish (cementitious, acrylic, silicone)
- Mechanical fixings;
- Adhesive fixings;
- Weather tight joints;
- Movement joints;
- Provision for limiting cold bridging at external wall/floor junctions in compliance with Acceptable Construction Details published by the Department of the Housing, Planning, Community, and Local Government (DHPCLG).
- Provision for fire stopping at external compartment walls and floors.

Farby KABE Polska is responsible for the design, manufacture and supply of all components to approved specifications. Farby KABE Polska has appointed MBC Project as their sole distribution partner in Ireland.

The systems are designed by MBC Project on a project specific basis in accordance with an approved Farby KABE design process.

The installation of the systems is carried out by installers who have been trained by MBC Project and are approved by Farby KABE, MBC Project and NSAI Agrément to install the systems. Applicators must adhere to strict installation guidelines as specified by MBC Project.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2023.

USE
The KABE THERM EPS & MW Systems are 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 Irish Building Regulations 1997 to 2023.

The 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.

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

In an Irish context, the appropriate 'Impact Resistance' category should be specified as described in Section 4.1.2, specifically Tables 2 and 3 which list a range of system build-ups and their corresponding impact resistance categories.

MANUFACTURE, DESIGN & MARKETING:
The systems are designed and manufactured by:

Farby KABE Polska SP Z o.o,
Ul.Slaska 88,
PL-40742,
Katowice,
Poland.
T: +48 606 793 222
W: www.farbykabe.pl

Project specific design, technical support, sales, and applicator training are performed by:

MBC Project,
Unit 20 Primeside Business Park,
Nortwest Business Park,
Ballycoolin,
Dublin 15.
T: 01 861 2120
E: info@mbcproject.ie
W: www.mbcproject.ie

1.1 ASSESSMENT
The KABE THERM EPS & MW Systems, which have been tested in accordance with the requirements of ETAG 004 (ref. ETA 14/0445 and 16/0079), 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, the KABE THERM EPS & MW Systems, when installed MBC Project trained and approved contractors registered with NSAI, in accordance with this Certificate and site specific design, can meet the requirements of the Irish Building Regulations 1997 to 2023, as indicated in Section 1.2 of this Agrément Certificate.

1.2 Building Regulations

REQUIREMENTS:

Part D – Materials and Workmanship
D3 – Proper Materials
The KABE THERM EPS & MW 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
The KABE THERM EPS & MW Systems, as certified in this Certificate, meet the requirements for workmanship.

Part A - Structure
A1 – Loading
The KABE THERM EPS & MW 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
The KABE THERM EPS & MW Systems can be incorporated into structures that will meet this requirement (see Parts 3 and 4 of this Certificate).

Part B – Fire Safety
B4 – External Fire Spread
Part B Vol 2 – Fire Safety
B9 – External Fire Spreade
The KABE THERM EPS & MW 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 as specified in Parts 3 and 4 of this Certificate.

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 the KABE THERM EPS & MW 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
- **Dwellings**
- **Buildings other than Dwellings**

L1 – Conservation of Fuel and Energy
The walls of the KABE THERM EPS & MW 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 Part L of the Building Regulations (see Part 4 of this Certificate).

L2 (L4/L5) – Conservation of Fuel and Energy
At interface junctions at windows and at junctions between elements, the KABE THERM EPS & MW Systems installation details have been assessed, and when installed in accordance with this Certificate and the Certificate holder's approved installation details, excessive heat losses and local condensation problems associated with thermal bridging will be avoided.

Components		Coverage (kg/m^2)	Thickness (mm)
Adhesives	**KOMBI (For EPS only)** Cement based powder requiring addition of water 0.26 l/kg **KOMBI S (For EPS only)** Cement based powder requiring addition of water 0.24 l/kg **KOMBI WM1 & WM2 (For MW only)** Cement based powders requiring addition of water 0.20-0.23 l/kg	3.0 – 4.0 dry 5.0 – 5.5	3 - 10
Anchors	Anchors approved for use with the KABE THERM systems are listed in Annex 2 of ETA 14/0445 (EPS) and ETA 16/0079 (MW). Other anchors which are covered by ETA's issued to ETAG 014 may also be used.	-	-
Insulation	Austrotherm EPS Fasada Super and Fasada Premium EPS-EN 13163-T1-L2-W2-S5-P10-DS(70,-)2-DS(N)2-BS115-CS(10)70-TR100 Fire Class E Aged thermal conductivity 0.038W/mK for standard white EPS, 0.031W/mK for graphite enhanced EPS Density 17kg/m^3 MW slab Euroclass A1, max density 90kg/m^3 MW-EN 13162-T5-DS(70,-)-DS(70,90)-WS-WL(P)-TR10 (TR80 for lamella) 3 MW boards: Isover TF PROFI (Standard Density), FRONTROCK MAX E (Double Density), FASROCK LL (Lamella)	- -	50 – 300 50 – 250
Plinth insulation	XPS-EN 13164 CFC/HCFC-free, Fire Class E	-	30 - 200
Base coat	**KOMBI (For EPS only)** Cement based powder requiring addition of water 0.26 l/kg **KOMBI MW2 (For MW only)** Cement based powder requiring addition of water 0.26 l/kg	Approx 3.0 – 5.0 (dry) 5.0	Average: 4.0 Minimal: 2.0 Average 3.4 Minimal: 3.0
Glass fibre mesh	**R117 A101/AKE 145/KABE 145 (For EPS only)** Standard fibre single layer mesh with mesh size 4.0 x 4.5mm **R131 A101 (For EPS only)** Standard fibre single layer mesh with mesh size 3.5 x 3.8mm **For MW only:** **KABE 145 / R117 A101 / AKE 145** **KABE AG 145 / 03-43** **KABE V 145 / GG-145** **KABE 150 / OPTIMA-NET 150** **KABE 160 / R131 A101 / AKE 170** **KABE AG 160 / 03-1** **KABE 165 / OPTIMA-NET 165** **KABE 175 / ST 112-100/7KM** **KABE 335 / 03-15 / REDENT E335** Standard fibre mesh with mesh size 3.0 x 3.0mm	1.1 – 1.2 m^2/m^2 ETICS	-

Table 1: KABE THERM Component Specification

Components		Coverage (kg/m²)	Thickness (mm)
Key coat	**PERMURO GT** Water dispersion of acrylic resin, fine-grained filler **NOVALIT GT** Water solution of potassium silicate, water dispersion of acrylic resin, fine-grained filler **ARMASIL GT** Water solution of potassium silicone, water dispersion of acrylic resin, fine-grained filler **MINERALIT GT (For MW only)** Ready to use liquid to be used with mineral finishing coats	0.15 – 0.25 l/m²	-
Finishing coat	Ready to use pastes – binder based on acrylic copolymer: **PERMURO (For EPS only)** SP structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.4 – 4.5	Regulated by particle size
	PERMURO (For EPS only) SD structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.3 – 4.5	
	PERMURO AVANT (For EPS only) SP structure (particle size 1.5, 2.0mm)	2.4 – 3.0	
	PERMURO AKORD (For EPS only) SP structure (particle size 1.5, 2.0mm)	2.0 – 2.5	
	Ready to use paste – binder based on silicate: **NOVALIT T SP** Floated structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.5 – 4.5	1.5
	NOVALIT T SD Ribbed structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.5 – 4.5	2.5 – 3.0
	NOVALIT T AKORD Floated structure (particle size 1.5, 2.0mm)	2.2 – 2.8	
	NOVALIT T-DECOR (For MW only) Consisting of layers: - NOVALIT T SP - NOVALIT T MODELOWANY (particle size 0.5mm)	 2.5 – 4.5 1.5 – 2.0	Regulated by particle size
	NOVALIT T – CEGLA (For EPS only) Brick rendering coat consists of layers: - NOVALIT T: SP structure (particle size 1.5mm) - NOVALIT T MODELOWANY - NOVALIT T MODELOWANY	5.0 – 6.0	1.5 2.5 – 3.0
	Ready to use pastes – binder baced on silicone: **ARMASIL T SP** Floated structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.3 – 4.5	6.0 – 8.0
	ARMASIL T SD Ribbed structure (particle size 1.5, 2.0, 2.5, 3.0mm)	2.3 – 4.5	
	ARMASIL T AKORD Floated structure (particle size 1.5mm)	2.2	
	ARMASIL T CEGLA (For EPS only) Brick rendering coat consists of layers: - ARMASIL T: SP structure (particle size 1.5mm) - ARMASIL T MODELOWANY - ARMASIL T MODELOWANY	5.0 – 6.0	
	ARMASIL T-DECOR (For MW only) Consisting of layers: - ARMASIL T SP - ARMASIL T MODELOWANY (particle size 0.5mm)	 2.3 – 4.5 1.5 – 2.0	

Table 1 (continued): KABE THERM EPS Component Specification

Components		Coverage (kg/m²)	Thickness (mm)
Finishing coat	Mineral finishing coats – dry cement based powders requiring addition of 0.19-0.25l/kg of water: **MINERALIT T SP (For MW only)** Floated structure (particle size 1.5, 2.0, 3.0mm)	2.5 to 4.0	Regulated by particle size
	MINERALIT T SD (For MW only) Ribbed structure (particle size 1.5, 2.0, 3.0mm)	2.5 to 4.0	
	MINERALIT T AKORD (For MW only) Floated structure (particle size 1.5mm)	3.0	
	MINERALIT T-DECOR (For MW only) Consisting of layers: - MINERALIT T SP - KOMBI FINISZ (particle size 0.5, 1.2mm)	2.5 – 4.0 1.5 – 2.0	
	MINERALIT T / NOVALIT MODELOWANY-DECOR (For MW only) Consisting of layers: - MINERALIT T SP - NOVALIT T MODELOWANY (particle size 0.5mm)	2.5 to 4.0 1.5 to 2.0	
	Silicone decorative coat **ARMASIL F (For MW only)** Ready to use pigmented liquid to be used optionally with finishing coats: - MINERALIT T SP - MINERALIT T SD - MINERALIT T AKORD - MINERALIT T-DECOR	0.2 – 0.25	
	Silicate decorative coat **NOVALIT F (For MW only)** Ready to use pigmented liquid to be used optionally with finishing coats: - MINERALIT T SP - MINERALIT T SD - MINERALIT T AKORD - MINERALIT T-DÉCOR	0.2 – 0.25	
	Silicate decorative coat **CALSILIT F (For MW only)** Ready to use pigmented liquid to be used optionally with finishing coats: - MINERALIT T SP - MINERALIT T SD - MINERALIT T AKORD - MINERALIT T-DÉCOR	0.2 – 0.25	
	KREND Silicone Dash Receiver (For EPS only) Silicone coat to receive approved dash stones, nominal 6mm in diameter, supplied by Kilwaughter	12.0 – 16.0	
	Paints for insulated oversill: Dispersive acrylic paint **AKRYLATEX** Silicone façade paint **ARMASIL F**		
Ancillary materials	Soudal foams and sealants: SoudaFoam, Flexifoam, Silirub2 Silicone, FixAll, Mastic Sealant. All ancillary materials must be approved by Farby KABE, descriptions in accordance with 3.2.2.5 of ETAG 004.		

Table 1 (continued): KABE THERM Component Specification

2.1 PRODUCT DESCRIPTION

The KABE THERM EPS & MW Systems consist of thermal insulation boards/batts fixed both adhesively and mechanically to the external façade of a building. A base coat layer incorporating reinforcement mesh and a decorative finish is then applied.

The KABE THERM EPS System incorporates both standard and graphite enhanced expanded polystyrene (EPS), and the KABE THERM MW System incorporates mineral wool insulation.

See Table 1 for the full list of components of the KABE THERM EPS & MW Systems.

The systems can be applied on a variety of existing external surfaces such as concrete, brick or rendered masonry walls. They can also be fixed on surfaces of horizontal or tilted structural elements provided that they are not directly exposed to precipitation. These may include ceilings over passageways, internal walls and roofs (on the ceiling side) of garages or cellars adjacent to heated rooms.

The substrate on which the KABE THERM EPS & MW Systems will be used must have a reaction to fire class A1 or A2-s1 d0 in accordance with I.S. EN 13501-1.

2.2 MANUFACTURE, SUPPLY AND INSTALLATION

Farby KABE Polska is responsible for the design and manufacture of all components to approved specifications. Farby KABE Polska has appointed MBC Project as the distribution partner in Ireland, with 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 the KABE THERM EPS & MW Systems is carried out by MBC Project trained and approved installers in accordance with 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 Table 1 for the designation code that must be included on the insulation identification label.

Each container for other components, e.g. mesh, 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 must 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 must be stored in accordance with the manufacturer's instructions, in dry conditions, at the required storage temperatures. They must be used within the stated shelf life.

2.4 INSTALLATION

2.4.1 Approved Installers

Installation shall be carried out by MBC Project trained applicators who:

1) Are required to meet the requirements of an initial site installation check by NSAI Agrément prior to approval and are subject to the NSAI Agrément ETICS Approval Scheme.
2) Are approved by MBC Project and NSAI Agrément to install the product.
3) Have undertaken to comply with the Farby KABE installation procedure, requirements of this Certificate, and the Farby KABE Code of Practice for approved contractors.
4) Are employing Supervisors and Operatives who have been issued with appropriate identity cards by MBC Project. Each team must

consist of at least one ETICS Operative and ETICS Supervisor (can be the same person).

5) Are subject to supervision by MBC Project, including unannounced site inspections by both the Certificate holder and NSAI Agrément, in accordance with the NSAI Agrément ETICS Approval Scheme.
6) Are subject to periodic surveillance by the system manufacturer / MBC Project – site visits and office records.

2.4.2 General

MBC Project prepare a site package for each project, including wind loading and U-value calculations, requirements for materials handling and storage, method statements for installation, building details, fixing requirements, provision for impact resistance, maintenance requirements etc. This document forms part of the contract documentation for circulation to the home owner and the installer. Installers must adhere to the specification. Deviations must be approved by a MBC Project technical representative. MBC Project 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, MBC Project guarantees and home owner's manual will be issued on successful completion and sign-off of completed projects.

Mineral wool batts and lamella fire stop 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 by a suitably qualified MBC Project technical representative or MBC Project and NSAI Agrément approved contractor and all key information is recorded on the site survey form. The MBC Project pre-installation survey is also used to price the project and identify all the relevant factors/technical information which needs to be considered in the design of the external cladding system and important information to be included in the site specific pack. This pack would typically include wind load calculations and a fixing specification summary sheet, thermal bridging evaluation, surface condensation risk analysis, elemental wall U-value calculation, and a full set of project specific building details.

The survey will also establish the suitability of the substrate, and the MBC Project technical representative will determine if pullout resistance testing is required and what substrate preparation is required.

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 which prevent installation of the system in accordance with this Certificate and the Certificate holder's instructions, these discrepancies must be discussed with MBC Project and a solution implemented with the approval of the Certificate holder.

2.4.4 Procedure

- Following award of contract, the site specific pack is prepared by MBC Project based on the information recorded in the site survey form.
- Prepare substrate in accordance with the project specific site package. This will include brushing down of walls, washing with clean water and treatment with a fungicidal wash as required.
- The integrity of the existing substrate is assessed by checking the surface for loose render by tapping with a hammer and listening for a hollow sound. If render is loose it must be removed and replaced.
- At external window and door frame reveals, the existing render reveals should only be removed if a minimum clearance of 30mm cannot be achieved between the reveal and the window/door frame. This clearance must allow for opening sections of window and door frames. This is to allow the application of insulation around the reveals and heads of the doors and windows to significantly reduce cold bridging.
- 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.
- Refer to the site package for guidance on modifications of down pipes, soil and vent pipes, pipe extensions etc.
- Where possible all pipe work should be relocated as required to accommodate the insulation. Where pipe work cannot be relocated and is to be housed in the depth of the system, access for maintenance must be maintained through the use of removable covers or alternative design to be approved by the Certificate holder.
- Base beads and all full system beads are fixed as specified. Insulation and render only beads are fixed as specified in the site package.
- The starter track is mechanically fixed to the substrate level with the DPC line. This provides a horizontal line for the installation of insulation panels as well as providing reinforcement to the lower edge of the system. In addition, the starter track serves as a bottom end closer to impede vermin and burrowing insects.
- XPS boards are then fixed to the wall below the starter track. These boards provide the necessary resistance to both moisture and water vapour ingress. To minimise the effects of cold bridging, the XPS boards should extend below ground level where possible. Where this is not possible, the first run of XPS boards should be positioned at ground level as detailed in Figure 1.
- The insulation boards are bonded to the wall by applying the specified adhesive (see Table 1) to the boards using the "strip-point" method. A circumferential ribbon of adhesive at least 30mm wide in diameter is applied to the insulation boards. 6 – 8 evenly distributed patches of adhesive 80 – 120mm in diameter are then applied to the boards so that an adhesive surface of at least 40% is achieved (60% after application and pressing), and the thickness should be <10mm when pressed.
- If using the notched trowel method, first apply the adhesive to the back-facing side of the insulation board so that when it is applied to the substrate, the notched trowel pattern runs in a consistent vertical pattern. The notched pattern should cover the board face all the way to the board edges. To ensure sufficient bonding and coverage of the adhesive to the insulation board should be visible in between the notches / grooves of adhesive. Adhesive should only be applied to the back-facing side of the insulation board. Remove any adhesive from insulation board edges.
- Before applying adhesive to mineral wool, the boards must be cleared of dust and loose particles. The boards should be initially covered with adhesive by applying a thin layer using a smooth edge trowel in order to increase adhesion. On the surface of the mineral wool prepared as described above, the actual adhesion layer can be applied as a thin layer using a notched trowel or using the "strip-point" method as described previously for the EPS insulation boards.
- Subsequent rows of insulation boards are installed on top of the starter track and positioned so that the vertical board joints are staggered and overlapped at the building corners.
- To avoid thermal bridging, ensure a tight adhesive free joint connection between adjacent insulation boards. A foam filler approved by the Certificate holder may be used for filling gaps up to 5mm. When used, the expanding foam should have a fire-rating of B2 or better and a maximum lambda value of 0.035 W/mK. Larger gaps should be avoided. Where gaps greater than 5mm cannot be practically avoided these gaps shall be filled with strips of the approved ETICS insulation material cut to size and sufficiently fixed to the substrate.
- At façade openings, e.g. window and door opes, full insulation boards must be installed across these openings in elevation and then the insulation is cut back to reinstate the clearance at the opening. This method of installation will minimise the linear length of abutments and joints between boards at openings. In addition, vertical joints should be staggered. Any projecting EPS boards should be levelled out using a rubbing board with local trimming as required on mineral wool boards.
- 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 DECLG, Detail 2.21, to achieve an R-value of 0.6m^{2}K/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.
- To minimise the effects of cold bridging in all other junctions over and above windows and doors, designers should consider the recommendations of the Acceptable Construction Details Document (published by the DECLG), Section 2 – External Wall Insulation. Where clearance is limited, remove plaster at reveal and strips of approved insulation (with better thermal resistance

values) should be installed to suit available margins and details recorded as outlined in Section 4.5 of this Certificate.

- Details of mechanical fixings (including their arrangement in the insulation boards) are specified in the project specific design based on pullout test results, substrate type and wind loading data. A minimum number of 5 mechanical fixings per m^2 shall be installed for EPS and a minimum number of 7 mechanical fixings per m^2 shall be installed for MW unless otherwise specified in the project specific design.
- Above two stories an additional stainless steel fire fixing is provided at a rate of 1 per m^2.
- For drilling holes in thin or cavity materials (hollow block), a drill with an engaged hammer action should not be used. Minimum pullout resistance of mechanical fixings must be established, alternatively low pullout values will require an increased frequency of fixing.
- The heads of mechanical fixings cannot protrude beyond the plane of the boards i.e. they should be exactly flush. Excessively deep insertion of fixing heads in the insulation material can cause cracking of the boards which in turn weakens the insulation. Filling indentations in these areas can cause thermal bridges and consequently may lead to plaster loosening in such areas.
- 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 must 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 with PVC stop-ends are installed in accordance with the Certificate holder's instructions, with a thin approved 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.
- The Certificate holder also offers an insulated resin coated sill for use with the KABE THERM EPS & MW Systems on buildings up to 2.5 storeys in height. This insulated sill is manufactured from high density EPS with a layer of reinforcement mesh and a resin coating applied in production. **Installation of the sill must not proceed if it would result in the window weep holes being covered.** The existing sill should be cut flush with the existing substrate, and should be cleaned thoroughly to ensure a good bond with the oversill adhesive. A notch of 50-70mm is cut into the insulation boards directly in front of the sill to achieve the desired overhang. The sill is cut to fit the window ope as tightly as possible and fixed with Kombi or Kombi S adhesive. Any gaps between the sill and the existing reveal should be filled with Soudal Silicone or Mastic Sealant. The frame bead is fixed between the sill and window frame by applying a continuous bead of Soudal Mastic into the joint and then inserting the bead which must cover the entire width of the window frame uninterrupted. When the adhesive has set the new window reveal can be fitted using 20mm EPS insulation. This will cover the ends of the bead. Window frame seal beads are then fitted to the frame as usual but also extended over the top surface of the sill providing an additional seal. To join sills to form a sill larger than 2.4m or bay windows, the two ends of the sill are mitre joined with Kombi or Kombi S adhesive. Any excess adhesive is removed flush with the top surface of the sill. The joint should be reinforced by the application of a mesh layer using Kombi basecoat. The mesh must be a minimum of 400mm wide and cover the entire joint. It may be necessary to re-surface the whole sill with Kombi to ensure a consistent finish. During application of basecoat the cut ends of the sill should be case coated with Kombi and mesh reinforcing and primed as normal. The sill can then be finished with an exterior finish coat from the KABE range.
- Lamella fire stops are installed in accordance with the Certificate holder's instructions as defined in Section 4.2 of this Certificate, at locations defined in the project specific site package.
- For EPS insulation, any high spots or irregularities should be removed by lightly planing with a rasp to ensure the application of an even thickness of base coat. After sufficient stabilisation of the insulation (normally 2 days, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation), and after the mechanical fixings have been installed, the insulated wall is ready for the application of the base and finish coats.
- EPS boards exposed to UV light for extended periods prior to the application of the render coatings are subject to breakdown and should be rasped down as required in preparation for rendering.
- Movement joints shall be provided in accordance with the project specific site package.
- At all locations where there is a risk of insulant exposure, e.g. window reveals, eaves or stepped gables, the system must be protected, e.g. by an adequate overhang or by purpose-made sub-sills, seals or flashings.
- Building corners, door and window heads and jambs are formed using angle beads bonded

to the insulation in accordance with the Certificate holder's instructions.

- To minimise the thermal bridge effect during the installation of railings, exterior lighting, shutter guide rails, canopies, aerials, satellite dishes etc, the Certificate holder offers a range of anchoring options. These fixings /anchors must be installed in accordance with the Certificate holder's instruction, as defined in the project specific site package, during the installation of the insulation boards.
- Where the external insulation meets intersecting walls etc and the abutting structure cannot be cut back, the edge of the insulation where it meets the wall should be protected using PVC universal stop-trim, followed by the application of a low modular silicone sealant between the top coat and the abutting structure.
- Prior to application of base coat and finish coat, all necessary protective measures such as taping off of existing window frames and covering of glass should be in place.
- If it is not possible to install the ETICS to all external walls, alternative forms of thermal upgrades, such as full fill cavity wall insulation or dry lining, should be provided where physically and economically feasible. There should be an adequate overlap at the junction between the ETICS and the alternative insulation method selected to limit thermal bridging at this interface.
- Expansion joints should be used at intersections where movement in the structure is expected, and these should be incorporated into the project specific design provided by the Certificate holder. In the case of un-heated lean-to buildings, the ETICS should continue around the lean-to.
- In sunny weather, work should commence on the shady side of the building and be continued following the sun to prevent the rendering drying out too rapidly.
- The base coat is prepared as described in Table 1 and is evenly applied to the surface of the insulation boards at approximately 2/3 of the final base coat thickness using a stainless steel trowel.
- The reinforcing mesh must be immediately embedded into the fresh base coat, trowelling from the centre and outward to the edges, with a 100mm overlap maintained at all ends and edges. The mesh should be free of rippling or creases and must be fully embedded in the base coat. The mesh should always be embedded in such a way that in the case of thin-layered reinforcement the mesh is in the middle of the base coat layer, and in the case of thick-layered reinforcement it is in the upper third of the base coat layer. The mesh can be laid either vertically or horizontally.
- Allow to set and apply a second coat of base coat to ensure an overall thickness of 3-5mm of the base coat layer.
- Where a double layer of mesh is to be applied to achieve Category I impact resistance (see Table 2 and 3 of this Certificate), each layer of the mesh shall be applied separately. The first layer is applied by covering the insulation with a layer of basecoat approximately 2/3 of the final base coat thickness using a stainless steel trowel. The first layer of reinforcement mesh must be immediately embedded into the freshly applied base coat, trowelling from the centre of the mesh and outward to its edges, with 100mm overlaps maintained at all ends and edges. The second layer of basecoat and mesh is then applied using the same procedure while the first layer is still wet, to provide a combined thickness of 6-7mm.
- Where required, in the case of fire fixings, fixings can be installed through the reinforcing mesh. This should be done before the basecoat hardens. Mechanical fixings placed through the reinforcement should be smooth over with basecoat as soon as they have been installed.
- An additional diagonal reinforcement must be applied at all corners of the façade openings. This involves embedding diagonal strips of mesh 200x350mm into the basecoat at a 45° angle in relation to the lines determined by the reveal, ensuring a double layer of mesh in these areas.
- Base profiles and corner profiles are fixed as specified in the site specific pack. Existing structural expansion joints should be extended through the surface of the ETICS with full system expansion beads.
- Refer to the Certificate holder's instructions and project specific site package regarding the requirement of additional fire fixings to be provided at a rate of one per square metre above two stories. The fixing design should take account of the additional layers of mesh that are also applied at these locations.
- The primer and/or finish coat must not be applied until after the base coat has dried out fully (3 days approximately).
- Primers (see Table 1 for approved list of primers and their compatibility with finishing coats) shall be applied in accordance with the Certificate holder's instructions and allowed to dry fully prior to the application of the finishing coat. Render primers prevent penetration of impurities from the adhesive into the render, protects and reinforces the substrate, and increases the bond strength between the render and the substrate.
- It is imperative that weather conditions are suitable for the application and curing of the KABE THERM EPS & MW System finish coats. Finish coats should not be applied when the air or wall temperature is below +5°C or above 25°C for the duration of the curing time. In wet weather the finished walls should be protected to prevent wash-off. It is also advisable that

protective covers remain in place as required to maximise the drying process.

- To minimise colour shade variations and to avoid dry line jointing, continuous surfaces should be completed without a break. If breaks cannot be avoided they should be made where services or architectural features, such as reveals or lines of doors and windows, help mask cold joints.
- Where long uninterrupted runs are planned, planned, containers of the finish coat should be checked for batch numbers. Containers with different batch numbers should be checked for colour consistency.
- A number of finishing coat options are available for the KABE THERM EPS & MW Systems. Consult Table 1 for suitable finishing coats. Finishing coats must be applied in accordance with the Certificate holder's instructions.
- Where dash is being applied (for KABE THERM EPS System only), the base coat and first layer of reinforcement mesh are applied as previously described. Once the base coat is touch dry, an additional layer of base coat is applied and the second layer of mesh is embedded with mechanical fixings through this second layer of mesh. This second layer of basecoat is scraped with a castellated trowel to provide a better key for the dash receiver coat. The KRend Silicon dash receiver coat is then applied to the correct minimum thickness (6 to 8mm). While the render is still soft, selected clean and approved Kilwaughter Dashing Aggregate (nominal 6mm in diameter) is thrown or sprayed onto the surface. On completion, the surface must be checked to ensure an even coverage of dash has been achieved. Where necessary, the aggregate should be lightly tamped to ensure that a good bond is achieved.
- All rendering should follow best practice guidelines, e.g. BS 8000-10:1995 *Workmanship on building sites – Code of practice for plastering and rendering* and IS EN 13914-1:2016 *Design, preparation and application of external rendering and internal plastering – External rendering*.
- On completion of the installation, external fittings, rainwater goods etc. are fixed through the system into the substrate in accordance with the Certificate holder's instructions. Further guidance on fixings is contained in the homeowner's pack.
- When obstructions abut external walls such as a boundary wall, best practice would be to cut back the boundary wall too allow for the continuation of the external insulation system.
- All necessary post-application inspections should be performed and the homeowner's manual completed and handed over to the homeowner accordingly.

Note: EPS insulation is shown in the following details for illustrat
EPS and MW Systems can be obtained from the certificate holder

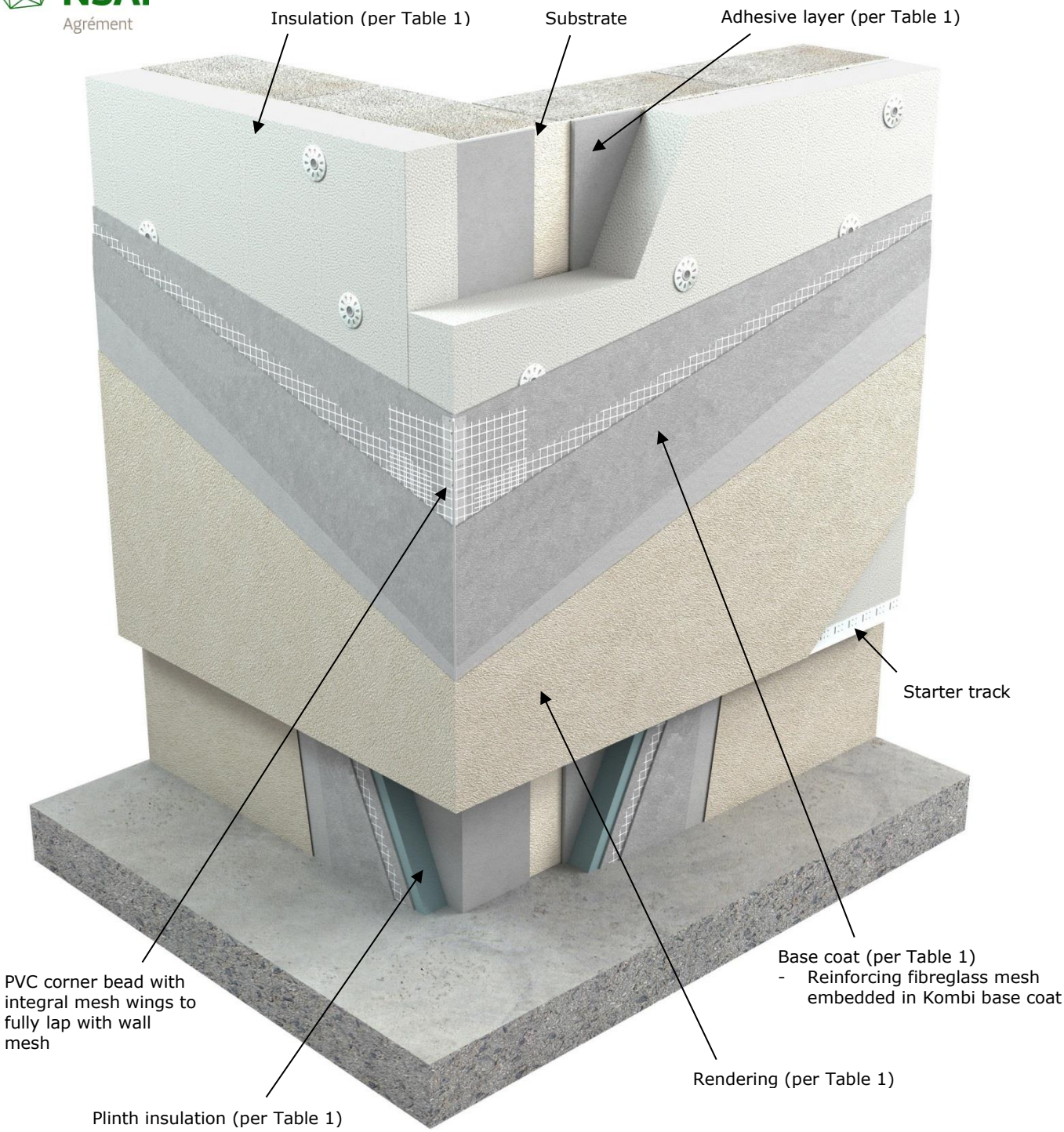

Figure 1: Build up of system components

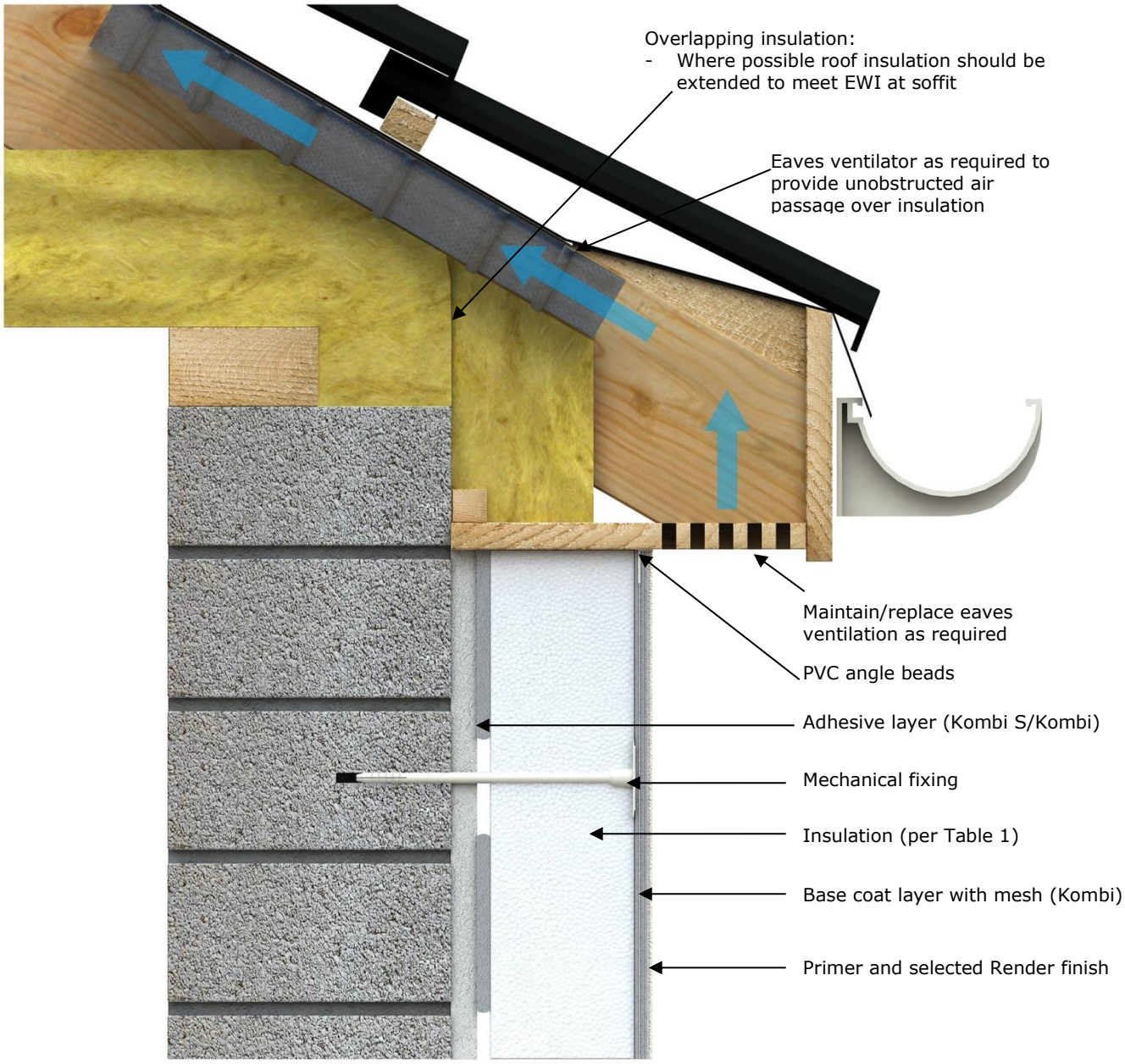

Figure 2: Eaves detail

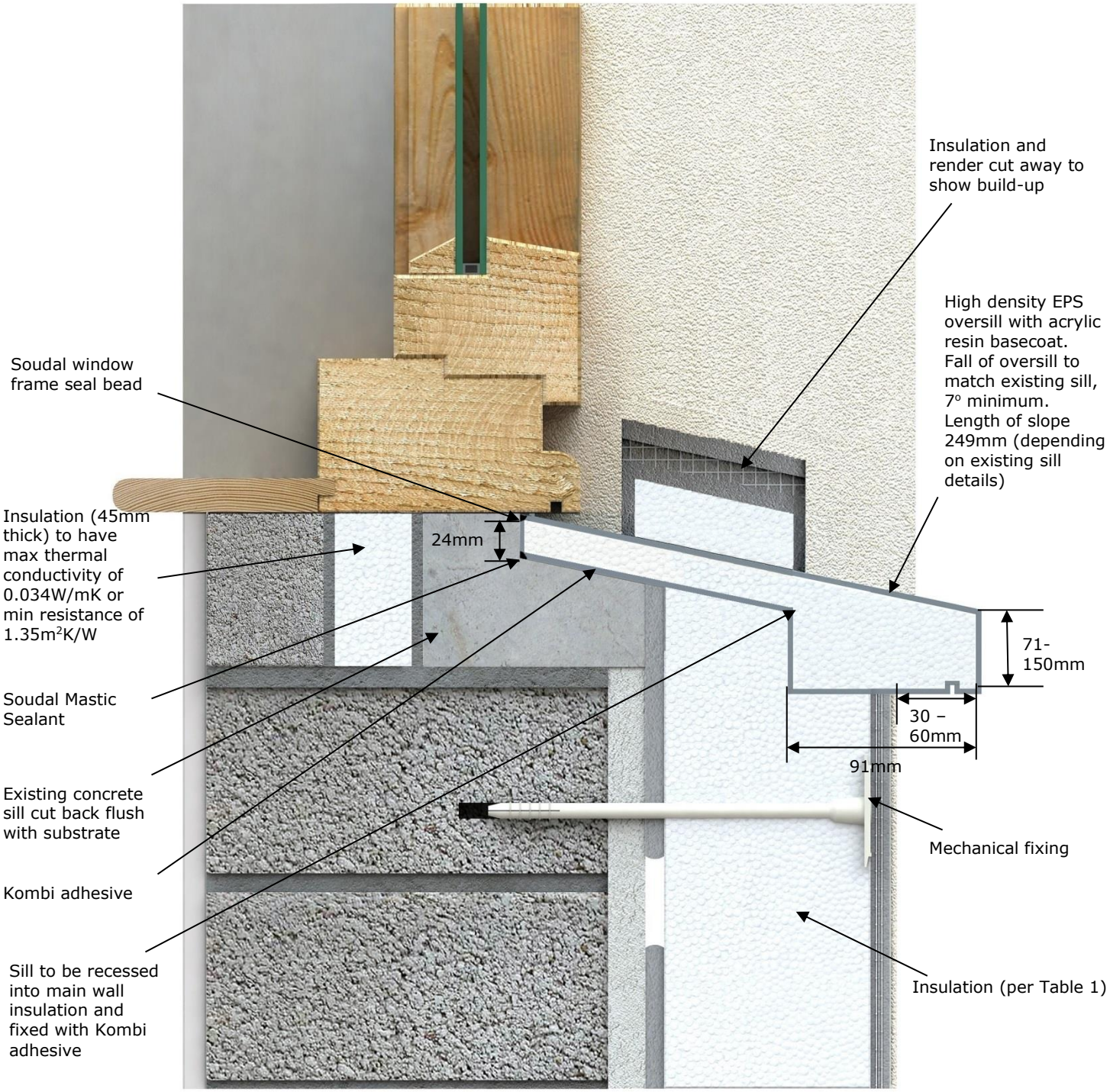

Figure 3: Insulated sill detail

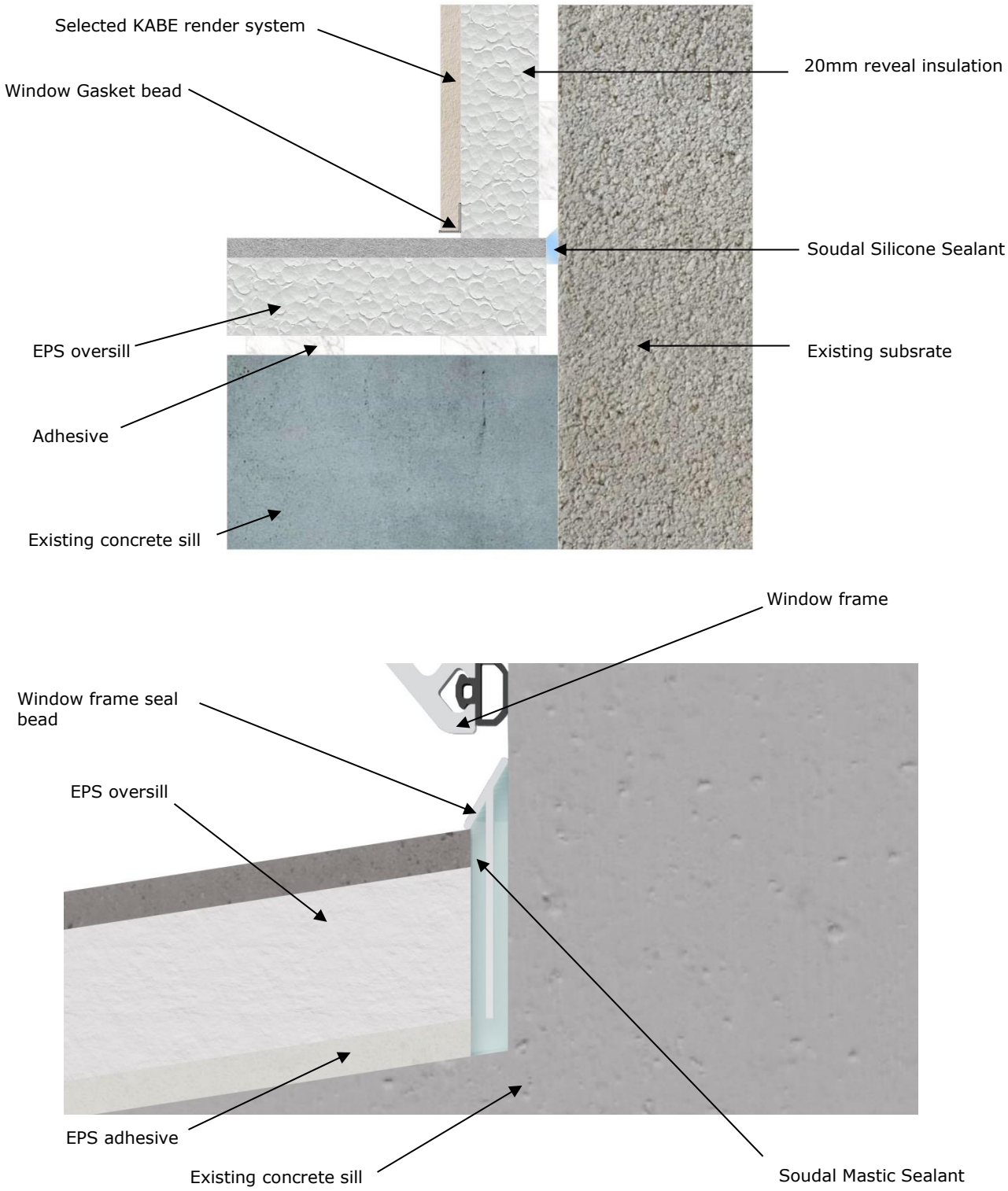

Figure 3a: Insulated sill detail (expanded view)

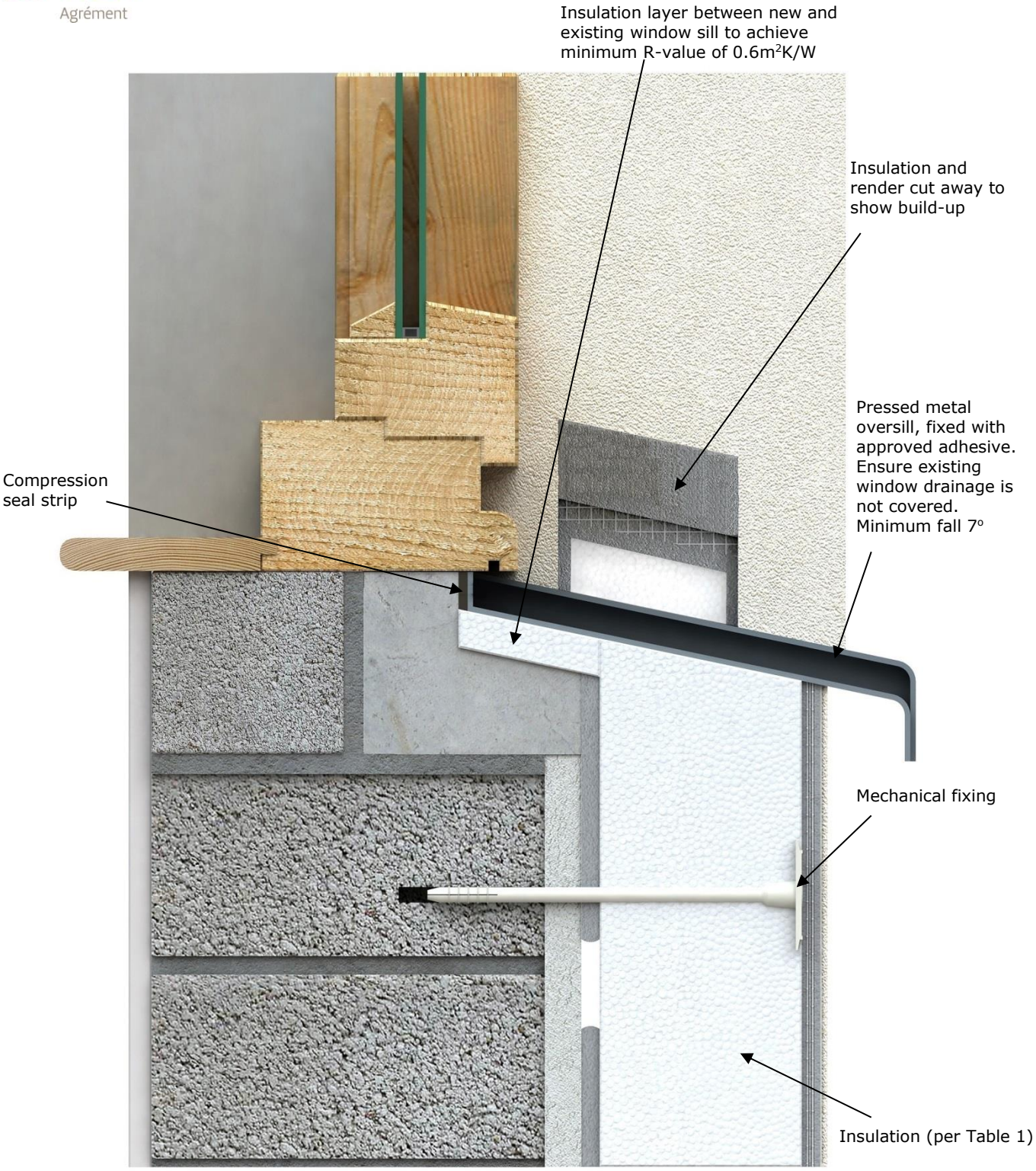

Figure 4: Metal sill detail

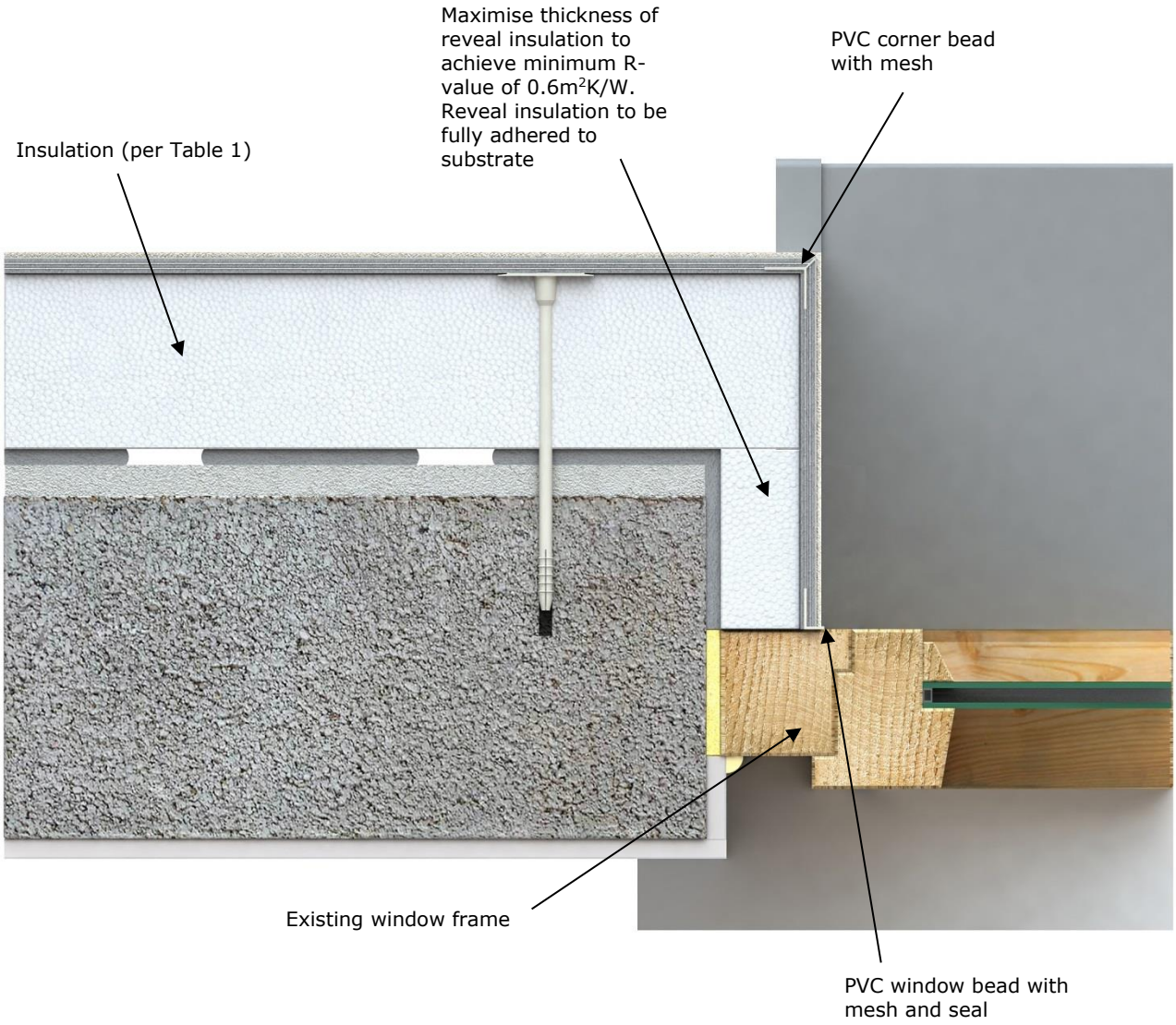

Figure 5: Window reveal detail

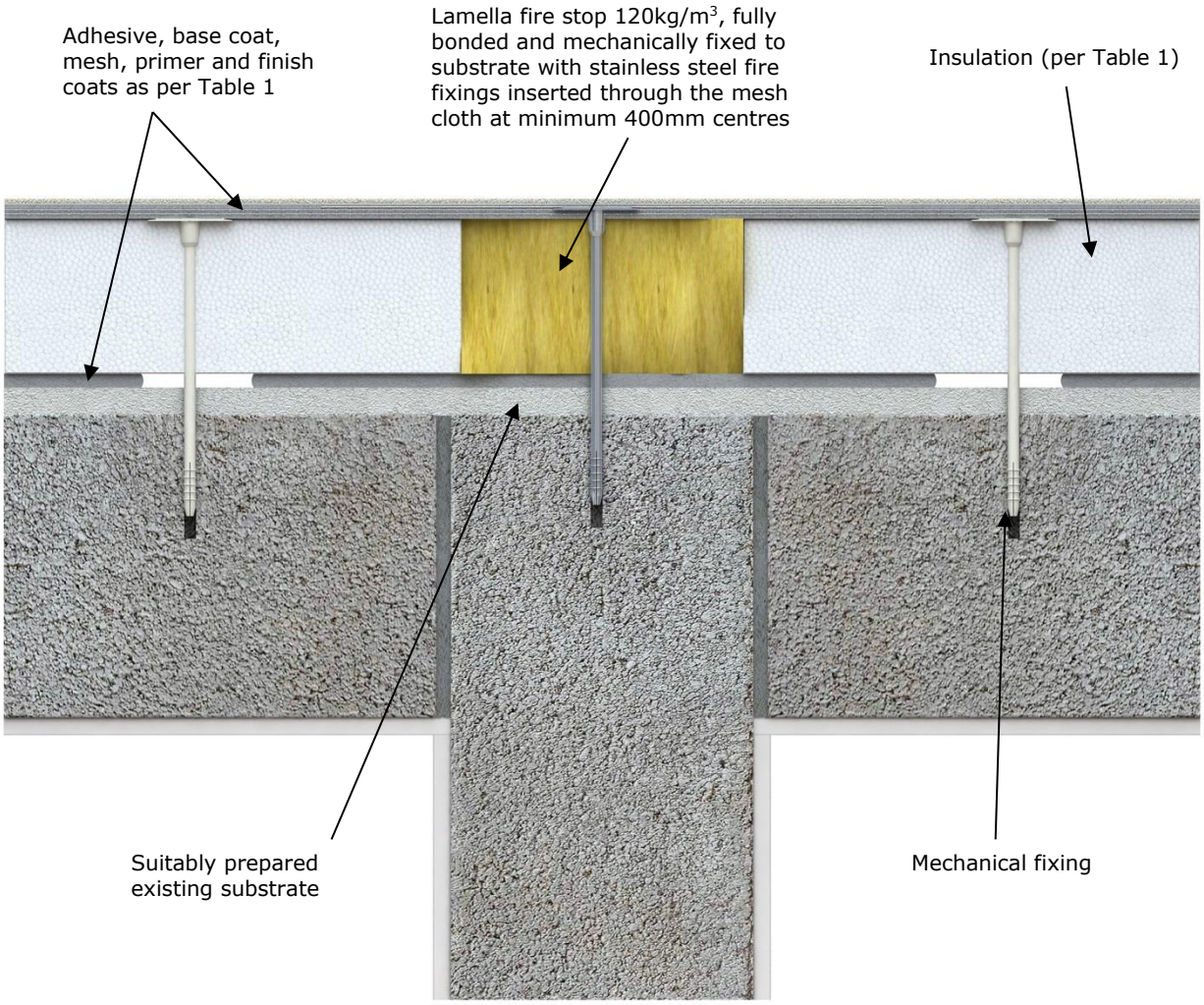

Figure 6: Firestop detail

3. GENERAL

The systems are designed by MBC Project on a project specific basis. Where the external insulation system is being applied to improve the thermal performance of an existing building, MBC Project 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, condensation risk analysis, 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 5250:2016 *Code of practice for control of condensation in buildings*. This includes the use of approved installation detailing as shown in Figures 1 to 6, incorporating the requirements of SR 54:2014 *Code of practice for the energy efficient retrofit of dwellings* and, where possible, meeting all of the Acceptable Construction Details published by the DHPCLG.
d) Thermal insulation provision to Part L of the Building Regulations.
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 3 (three) 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 chartered engineer in accordance with Eurocode 1: I.S. EN 1991-1-4:2005 *General actions – Wind actions*.
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 systems will satisfy the wall elemental U-value and linear thermal transmittance requirements of Part L of the Building Regulations. 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 the DHPCLG.

The systems are 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 consulting the Certificate holder.

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

4.1 STRENGTH AND STABILITY

4.1.1 Wind Loading

The KABE THERM EPS & MW Systems can be designed to withstand wind pressures (including suction) and thermal stresses in accordance with the Building Regulations. The design for wind loading on buildings greater than two stories should be checked by a chartered engineer in accordance with Eurocode 1 I.S. EN 1991-1-4:2005 *Actions on structures – General actions – Wind actions*. A general factor of safety of 1.5 is applied to design wind loads.

4.1.2 Impact Resistance

a) The KABE THERM EPS & MW Systems have been classified as defined in Table 2 to be suitable for use as defined in ETAG 004 Cl. 6.1.3.3 Table 8 as follows:
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.

4.2 BEHAVIOUR IN RELATION TO FIRE

The reaction to fire classification according to IS EN 13501-1:2007 *Fire classification of construction products and building elements – Classification using data from reaction to fire tests* for the full systems including insulation board, adhesive, base coat, finishing coats and decorative coats are defined as B-s1,d0 for the KABE THERM EPS System and A2-s1,d0 for the KABE THERM MW System.

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.

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

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, and Sections 3.5, 3.6, 3.7 and 4 of TGD to Part B Volume 2 of the Building Regulations. Stainless steel fire fixings are to 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 400mm vertical centres and 400mm 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). 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/m^3), 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 for types of suitable firestop).

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 2.15 of TGD to Part J of the Building Regulations. 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 can be achieved using the KABE THERM EPS & MW Systems. The manufacturer's declared thermal conductivity values ($\lambda_{90/90}$) taken from their CE Marking Declarations of Performance are 0.038W/mK for the standard white EPS board, 0.031W/mK for the graphite enhanced EPS board and 0.036W/mK for the mineral wool board. These have not been assessed by NSAI Agrément. Table 4 shows typical insulation thicknesses to achieve the required 0.27W/m^{2}K U-value.

Calculation of U-values will be required on individual projects to confirm a U-value of 0.27W/m^{2}K 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 stated on the manufacturers' Declarations of Performance.

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 ETICS 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 F of the Irish Building Regulations.

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 KABE THERM EPS & MW 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.

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 the Acceptable Construction Details published by the DHPCLG, 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 in accordance with BRE IP1/06 *Assessing the effects of thermal bridging at junctions and around openings* and BRE BR 497 *Conventions for calculating linear thermal transmittance and temperature factors* in accordance with Appendix D of TGD to Part L of the Building Regulations.

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, 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 via MBC Project as to acceptable minimum requirements.

4.6.2 Interstitial Condensation

An interstitial condensation risk analysis will be carried out by MBC Project in accordance with BS 5250:2016 and the design modified as appropriate to reduce the risk of surface condensation to acceptable levels.

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, the homeowner should be informed and remedial action should be taken before the external insulation system is installed.

4.7 MAINTENANCE

Regular inspections must be made over the life of the system. 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.

- Visually inspect the render and architectural details for signs of damage or water ingress (at least annually).
- Necessary repairs must be carried out immediately and must be in accordance with the Certificate holder's instructions to prevent deterioration or damage, and to protect the integrity of the system.
- Sealants shall be subject to regular inspection (at least annually).
- Sealants should be replaced as required and fully replaced every 18 to 20 years to maintain performance.
- 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.

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 assessment indicates that the system should remain effective for at least 30 years subject to normal use, regular inspection and maintenance; providing that it is designed, installed and maintained in accordance with this Certificate.
Any damage to the surface finish shall be repaired immediately and regular maintenance shall be undertaken as outlined 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 13914-1:2016 for general advice on design, in particular on the use of angle, stop and movement joint beads.

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;
- Proximity to vegetation;
- Local climate/atmospheric pollution.

Where cleaning of the walls is required, for example in the case of algal growth, the procedure in the Farby KABE Ease of Maintenance document must be followed which contains detailed information on the removal of different types of algae and the use of Algae Clean, which is a water-based, anti-bacterial fungicidal concentrate wash used to treat moulds, algae and lichens.

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 conjunctions with this Certificate.

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

KOMBI base coat + reinforcement and finishing coats indicated hereafter:	**Single standard mesh**	**Double standard mesh**
PERMURO	Category II	-
PERMURO AVANT	Category II	-
PERMURO AKORD	Category III	-
NOVALIT T	Category II	-
NOVALIT T AKORD	Category II	-
NOVALIT T – CEGLA	Category II	-
ARMASIL T	Category II	-
ARMASIL T AKORD	Category II	-
ARMASIL T – CEGLA	Category II	-
PERMURO GT primer + PERMURO SP	-	Category I
KRend Silicon Dash Receiver	-	Category I
KRend Silicon Dash Receiver + Aggregates	-	Category I

Table 2: Impact Resistance – EPS System

KOMBI WM2 base coat + relevant key coat + single layer reinforcement and finishing coats indicated hereafter:	**Standard board**	**Double density board**	**Lamella**
MINERALIT T SP	Category II	Category III	Category II
MINERALIT T SD	Category II	Category III	Category II
MINERALIT T AKORD	Category III	Category III	Category III
MINERALIT T-DECOR	Category III	Category II	Category II
MINERALIT T / NOVALIT T MODELOWANY-DECOR	Category III	Category II	Category II
ARMASIL T SP	Category II	Category III	Category III
ARMASIL T SD	Category II	Category III	Category III
ARMASIL T AKORD	Category II	Category II	Category II
ARMASIL T-DECOR	Category III	Category III	Category II
NOVALIT T SP	Category II	Category III	Category II
NOVALIT T SD	Category II	Category III	Category II
NOVALIT T AKORD	Category II	Category II	Category II
NOVALIT T-DECOR	Category III	Category III	Category II

Table 3: Impact Resistance – MW System

Existing Wall Structure	Insulation Type	Declared Thermal Conductivity ($\lambda_{90/90}$) of Insulation (W/mK)	Thickness of Insulation (mm)					
			None	100	110	125	140	170
215mm Block-on-Flat (No insulation)	Standard White EPS 70	0.038	2.47	-	-	0.27		0.21
	Grey Graphite enhanced EPS 70.	0.031	2.47	-	0.26		0.21	
	Mineral wool	0.036	2.47	-	-	0.27		
215mm Hollow Block (No insulation	Standard White EPS 70	0.038	2.53			0.27		0.21
	Grey Graphite enhanced EPS 70.	0.031	2.53		0.26		0.21	
	Mineral wool	0.036	2.53			0.27		
Concrete Block Cavity Wall (No insulation)	Standard White EPS 70	0.038	1.67	-	-	0.27	-	0.21
	Grey Graphite enhanced EPS 70.	0.031	1.67	-	0.26	-	0.21	-
	Mineral wool	0.036	1.67	-	-	0.27	-	
Concrete Block Cavity Wall with 50mm existing partial fill insulation.	Standard White EPS 70	0.038	0.57	0.26			0.21	
	Grey Graphite enhanced EPS 70.	0.031	0.57	0.23 (75mm is 0.27)		0.21		
	Mineral wool	0.036	0.57	0.26			0.21	
Concrete Block Cavity Wall fully filled with insulation	Standard White EPS 70	0.038	0.63	0.27			150mm is 0.21	
	Grey Graphite enhanced EPS 70.	0.031	0.63	80mm is 0.27		0.21		
	Mineral wool	0.036	0.63	0.27			150mm is 0.21	
450mm Rubble wall	Standard White EPS 70	0.038	2.73	-	-	0.27	-	0.21
	Grey Graphite enhanced EPS 70.	0.031	2.73	0.27	0.26	-	0.21	-
	Mineral wool	0.036	2.73	-	-	0.27	-	
Clay Brick-Concrete Block Cavity Wall (No insulation)	Standard White EPS 70	0.038	1.70			0.27		0.21
	Grey Graphite enhanced EPS 70.	0.031	1.70		0.26		0.21	
	Mineral wool	0.036	1.70			0.27		

These values are based on the following construction (External to Internal):

- Render finish with mesh basecoat – 6mm.
- Insulation material as specified.
- Render on existing concrete blockwork – 18mm (not on brickwork).
- Existing wall structures:
  - Blockwork on flat – 2000kg/m^3 (440x215x100) – 215mm
  - Hollow blockwork – 2000kg/m^3 (440x215x215) – 215mm
  - Concrete blockwork in cavity wall – 2000kg/m^3 (440x215x100) – 100mm
    Unventilated air cavity – 50mm
    Concrete blockwork in cavity wall - 2000kg/m^3 (440x215x100) – 100mm
  - Clay brickwork external leaf in cavity wall – 1700kg/m3 (215x65x102.5) – 102.5mm
    Unventilated air cavity – 50mm
    Concrete blockwork in cavity wall - 2000kg/m^3 (440x215x100) – 100mm
- Render – 16mm.
- Plaster, gypsum – 12.5mm.

All calculations assume horizontal heat flow, unventilated cavities <25mm with a thermal resistance of 0.18m^{2}K/W, 18mm of existing external render λ = 1.0W/mK, concrete blocks (thickness as specified) λ = 1.35W/mK, 16mm internal plaster λ = 0.3W/mK or 12.5mm plaster board λ = 0.25W/mK

Table 4: Typical U-values (W/m^{2}K)

KABE THERM EPS			
Configuration	**Organic content / Heat of combustion**	**Flame retardant content**	**Euroclass according to EN 13501-1**
Adhesive	Max 2% / Max 0.32MJ/kg	No flame retardant	B-s1, d0
EPS panels (max density 15kg/m^3)	In quantity ensuring Euroclass E according to EN 13501-1	In quantity ensuring Euroclass E according to EN 13501-1	
Base coat render	Max 2% / Max 0.32MJ/kg	No flame retardant	
Glass fibre mesh	- / Max 8.17MJ/kg		
Finishing coats of acrylic binder Finishing coats of silicone binder Finishing coats of silicate binder	- / Max 1.39MJ/kg		
KABE THERM MW			
Configuration	**Organic content / Heat of combustion**	**Flame retardant content**	**Euroclass according to EN 13501-1**
Adhesive	1.2% / -	No flame retardant	A1
MW panels* (density ≤ 90kg/m^3)	- / -		
Base coat	1.2% / -		
Glass fibre mesh: All except KABE 175 & KABE 335	- / 1.11MJ/m^2		
Key coat: MINERALIT GT	17.8% / 1.18MJ/m^2		
Finishing coats: MINERALIT T SP MINERALIT T SD MINERALIT T AKORD MINERALIT T-DECOR	1.4% / 0.28MJ/m^2		
Decorative cost: NOVALIT F	7.6% / 0.43MJ/m^2		
Adhesive	1.2% / -	No flame retardant	A2-s1, d0**
MW panels* (density ≤ 90kg/m^3)	- / -		
Base coat	1.2% / -		
Glass fibre mesh	- / 2.03MJ/m^2		
Key coat	20.1% / 1.18MJ/m^2		
Finishing coat	14.6% / 11.77MJ/m^2		
Decorative coat	18.5% / 0.96MJ/m^2		
*organic content in quantity ensuring Euroclass A1 according to EN 13501-1 **except configurations of KABE THERM MW System specified for Euroclass A1			

Table 5: Reaction to Fire

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 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. **15/0381** is accordingly granted by the NSAI to **Farby KABE Polska Sp Z o.o** on behalf of NSAI Agrément.

Date of Issue: **May 2015**

Signed

Kevin D. Mullaney
Director of Certification, NSAI

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:

- **September 2017:** Addition of EPS oversill, dash finish and mineral wool; update to Part B Volume 2 of the Building Regulations.
- **23 June 2023:** References to Building Regulations updated.
- **10 February 2025:** Revised wording under sections 4.7 and 4.9.1.