Proven Cladding Systems for High Rise Buildings

Market-leading external wall insulation systems, incorporating non-combustible mineral fibre insulation, that have an unrivalled safety record and meet UK fire safety guidance and Building Regulations standards.

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In the wake of the Hackitt review which followed the Grenfell Tower tragedy and the subsequent ban on the use of combustible materials in high rise buildings, building owners and other property stakeholders are faced with a renewed emphasis on fire safety to ensure that building occupants are safe.

This has resulted in an increase in concerns about the fire safety of cladding systems and how they meet the latest fire classification and Building Regulations requirements.

PermaRock, the UK’s leading manufacturer & supplier of high rise external wall insulation (EWI) systems, has unparalleled experience in this market sector and PermaRock Mineral Fibre EWI systems, with PermaRock SiliconeUltra K Finish, Mineral K (2.0mm) Finish, Dry Dash, Brick Slips and PermaRock Brick Effect Render finishes are tested and assessed to demonstrate that they fully meet these requirements.

Designed for projects on which the highest levels of fire safety are required, PermaRock Mineral Fibre EWI systems incorporate EuroClass A1 stone wool insulation. Systems have been retrofitted to 100s of high rise buildings throughout the UK over the past three decades, with real life examples and evidence proving that these systems have resisted fire spread and remained securely fixed to the building façade.

PermaRock Mineral Fibre EWI systems are directly attached to the wall face using a combination of adhesive bonding with mechanical fixings, and with no cavity which could support fire spread (unlike ACM Rainscreen or back-ventilated cladding systems).

These systems are suitable for installation above DPC level on all building types and heights and PermaRock Mineral Fibre systems with PermaRock SiliconeUltra K Finish, Mineral K (2.0mm) Finish, Dry Dash, Brick Slips and PermaRock Brick Effect Render have been tested and assessed to EN 13501-1:2007 + A1:2009 achieving on A2-s1,d0 classification, confirming compliance to the latest revisions to the Building Regulations for use on buildings without height restrictions.

They are the ideal cladding replacement solution for ACM and other failed or non-compliant cladding systems for high rise blocks and PermaRock systems are extensively specified by insurers, building owners and their consultants who demand market leading systems, proven experience and real-world performance and technical support in order to help them to make their high rise buildings safer.

PermaRock Mineral Fibre EWI Systems are also SWIGA (Solid Wall Insulation Guarantee Agency) approved high rise systems, EC03 compliant and meet PAS 2030 / 2035 and TrustMark requirements.
UK Building Regulations

On 21st December 2018 the Building (Amendment) Regulations came into force and imposed new restrictions on the fire performance of materials that can be used within the external walls of ‘relevant buildings’ in England. In the new Regulations ‘relevant building’ means a building with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level and which -

(i) contains one or more dwellings;
(ii) contains an institution; or
(iii) contains a room for residential purposes (excluding any room in a hotel or boarding house).

Under the new regulations, materials used in the external walls of affected buildings are required to be either Class A1 or Class A2-s1,d0 in accordance with BS EN 13501-1:2007+A1:2009 ‘Fire classification of construction products and building elements: Classification using test data from reaction to fire tests’.

Materials which may previously have been considered to be ‘non-combustible’ or ‘limited combustible’ or which gave results of Class 0, Class 1 etc. to the UK testing criteria are still acceptable for compliance with the requirements B1 to B5 in Approved Documents B, but cannot be deemed to meet the new criteria of the Building (Amendment) Regulations: Only by successful relevant testing and assessment to the EN13501-1 Standard can the required A1 or A2-s1,d0 classifications be achieved.

The new Amended Regulations also sets out a range of generic materials which do not need further testing and which are deemed to be compliant. Furthermore, the document also provides a list of materials which are excluded from the fire performance criteria:

- cavity trays when used between two leaves of masonry;
- any part of a roof (other than any part of a roof which falls within paragraph (iv) of regulation 2(6)) if that part is connected to an external wall;
- door frames and doors;
- electrical installations (as defined in the Building Regulations);
- insulation and waterproofing materials below ground floor level;
- intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B or Schedule 1;
- membranes;
- seals, gaskets, fixings, sealants and backer rods;
- thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1; or window frames and glass (within window frames).

PermaRock Mineral Fibre EWI systems meet the latest fire safety requirements as set out in the newly amended Building Regulations and Approved Documents. The A2-s1,d0 classification confirms that they will not make any significant contribution to the spread of fire.

View the latest UK Building Regulations / Standards:

- Fire safety: Approved Document B (England & Wales)
- Technical Handbook 2: Domestic - Fire (Scotland)
- Technical Booklet E - Fire Safety (Northern Ireland)
The programme was established to make sure that residents of high rise buildings are safe – and feel safe – now, and in the future.

The Ministry of Housing, Communities and Local Government (MHCLG) established the Building Safety Programme to cover high rise residential buildings over 18 metres, including hotels, to make sure that residents of high rise buildings are safe.

With the support of local fire and rescue services and a panel of independent expert advisers, MHCLG is supporting building owners in taking immediate steps to ensure their residents’ safety and in making decisions on any remedial work that is necessary to do.

The programme is working with building owners, housing providers, schools, hospitals and the construction industry, including an Industry Response Group.

For the latest information and advice please visit the DCLG’s Building Safety Programme website.
External Wall Insulation Systems

External Wall Insulation (EWI) Systems

Only PermaRock Mineral Fibre EWI Systems with an A1 or A2-s1,d0 classification are recommended for use on high rise, multi-storey buildings.

These systems incorporate non-combustible stone wool insulation in the form of rigid boards which are directly attached to the wall face, without a cavity, using a combination of adhesive bonding and mechanical fixing.

A fully reinforced, polymer-enhanced cementitious basecoat is applied directly onto the insulation. Non-combustible, stainless steel fixings are then introduced through this reinforced basecoat and through the insulation and adhesive layers to additionally anchor the basecoat to the substrate. This helps to ensure the stability of the system against the high wind suction loads associated with tall buildings, and provides critical additional support to the render system in the event of a fire, thereby helping to keep the building protected and ensuring safe access for emergency services.

The EWI system is then finished with a weatherproof, decorative layer of PermaRock Silicone Ultra K Finish, Mineral K (2.0mm) Finish, Dry Dash, PermaRock Brick Slips or PermaRock Brick Effect Render. Combinations of the finishes can also be used.

In addition to considering fire performance, the specifiers of EWI systems should also take into consideration the performance in relation to colour fastness, resistance to dirt and mould growth, surface discolouration, and ease of maintenance to minimise future maintenance / cleaning / cyclical redecoration programmes.

PermaRock External Wall Insulation (EWI) Fire Performance

PermaRock Mineral Fibre EWI systems for high rise buildings, including those with floor levels above 18 metres above ground level, have been tested and assessed to EN 13501-1:2007 + A1:2009 and achieve an A2-s1,d0 classification, confirming their compliance with the latest revisions to the Building Regulations and the Approved Documents.

PermaRock Mineral Fibre EWI Systems with acrylic decorative finishes (PermaRock Acrylic K Finish) have been fire tested to BS 8414-1 and assessed as satisfying the requirements of BR 135 - ‘Fire performance of external thermal insulation for walls of multi-storey buildings’. These systems also achieve a “Class O” classification under the Building Regulations Approved Documents B.

The fire safety credentials of a PermaRock Mineral Fibre EWI system attached to a sheathing board on a light steel frame wall assembly has also been demonstrated in a Fire Resistance test to BS 476 Part 22 where it achieved over 2 hours resistance and integrity.

PermaRock Mineral Fibre EWI systems do not contribute to the spread of fire across the façade or within a building onto which they have been applied.

Glossary of Fire Testing Standards / Test Methods

BS EN 13501-1:2007
Fire classification of construction products and building elements. Classification using data from reaction to fire tests (+A1:2009)

BR 135
Fire performance of external thermal insulation for walls of multi-storey buildings.

BS 476 Part 6
Fire tests on building materials and structures. Method of test for fire propagation for products.

BS 8414
Fire performance of external cladding systems. Test methods for non-load bearing external cladding systems applied to the face of building substrates.
PermaRock Mineral Fibre External Wall Insulation Systems

Overview

PermaRock Mineral Fibre external wall insulation systems provide excellent reaction to fire performance, and systems with an A2-s1,d0 classification in accordance with BS EN 13501-1:2007 + A1:2009 are also suited for use on high rise buildings, including those with floor levels above 18 metres above ground level.

PermaRock Mineral Fibre systems with PermaRock Siliconek K 1.5mm, Mineral K (2.0mm) Finish, Dry Dash, Brick Slip and Brick Effect Render Finishes are class A2-s1,d0* to BS EN 13501-1:2007 + A1:2009.

Key Features

- A2-s1,d0 reaction to fire classification (EN 13501-1:2007 + A1:2009) - can be used on buildings of any building height*
- SWIGA approved high rise system
- Adhesively bonded + mechanically anchored for enhanced resistance to wind loading
- Wide selection of decorative renders / finishes / effects

Quick Check

Approvals  
BRE Global Certification

Market Sectors  
Residential, Education, Healthcare, Public Buildings, Commercial

Substrate Types  
Brickwork, Dense + No-Fines Concrete, Blockwork, Metal Frame, Timber Frame

Building Height (limitations)  
No limit*

Decorative Render / Finishes  
See table overleaf

Insulation Thermal Conductivity (W/mK)  
0.036

Insulation Thicknesses  
50 - 250 mm**

*Dependent on decorative finish type and detail design
**30mm board available (0.39 W/mK)
**PermaRock SiliconeUltra K Finish / Mineral K Finish**

PermaRock SiliconeUltra K & R Finishes represent the state-of-the-art in external through-colour renders.

Based on a hybrid binder system of organically crosslinked nano-quartz particles and silicone emulsion, SiliconeUltra K & R Finishes are available in 500 colours (colour matching available) and offer a class-leading, self-cleansing effect, with enhanced resistance to dirt pick-up, providing cleaner surfaces for longer than conventional silicone, acrylic or mineral renders.

Lightweight, water repellent, with excellent water vapour permeability, they can also resist aggressive air pollutants. Photo-catalytic particles help actively break down dirt particles which can be washed from the surface under normal weathering, and they contain a preservative against coating deterioration due to algae and fungus.

**PermaRock Brick Slips** (see individual decorative finish sheet for full colour range)

PermaRock Brick Slips are a lightweight, flexible and breathable synthetic resin brick used to replicate brickwork (Colour matching available, subject to minimum order quantities).

**PermaRock Brick Effect Render** (see individual decorative finish sheet for full colour range)

PermaRock Brick Effect Render (BER) is pre-batched, two-coat self-coloured polymer-modified cement-based render designed to simulate the appearance of brickwork. (Colour matching available, subject to minimum order quantities)

**PermaRock Dry Dash** (see individual decorative finish sheet for full colour range)

Dry Dashing is a traditional decorative rendering technique that provides a tough, durable, long lasting, cost-effective and almost maintenance free finish to exterior wall surfaces.
Over and above the extensive research, testing and assessments that have been carried out on PermaRock Mineral Fibre EWI systems, the fire safety of PermaRock EWI systems has been proven in a number of real-life emergencies where fires in high rise buildings clad with these systems have occurred. In a multi-storey residential block in east London, a fire developed within a flat on the fifth floor. Flashover occurred and the fire broke out of the windows, with flames extending over 2m above the top of the windows. At this stage, the fire performance of the PermaRock system was critical: The absence of cavities within the system, and the secure attachment of the system to the wall via a combination of adhesive bonding and mechanical fixing of the insulation, along with stainless steel fixings through the reinforcement layer of the render system, ensured that the stability of the system under the extreme thermal stresses caused by the heat of the fire was maintained. The reaction to fire performance of the system ensured that it provided no contribution to the spread of the fire across the building facade, and the fire service was able to safely tackle the fire and to bring in under control. The PermaRock mineral fibre EWI system suffered only minor mechanical damage, largely associated with the areas immediately above the windows. Smoke damage and sooty deposits to the surface of the renders were more extensive as one might expect, but the system remained intact and was able to be repaired and brought back to its original condition with only localised repair and re-decoration.
BRE Global Ltd, which carries out fire investigations on behalf of the UK government (including the extensive testing of ACM cladding that was undertaken after the Grenfell tragedy) has investigated several fires in multi-storey buildings and some of these have been documented in its report entitled ‘External Fire Spread – Part 1 Background research’, BRE Global Ltd., April 2016 [1].

Download BRE Global Report

Whilst external fire spread has occurred in some of the case studies featuring other manufacturers’ claddings, BRE has acknowledged that the PermaRock Mineral Fibre EWI system installed on a multi-storey high rise residential block in Glasgow resisted fire and actually prevented the fire spreading across the building façade. The fire, which developed on the 11th floor of the 22-storey building, broke out of the windows exposing the PermaRock EWI system to the force of the fully developed fire. Damage was localised to the immediate vicinity of some of the windows but, beyond this, the effects were limited to surface charring and sooting.

Similar fires have occurred on other high rise multi-storey residential blocks and, in all cases, the PermaRock Mineral Fibre EWI systems have proven to be robust and resilient, preventing fire spread and remaining securely attached to the wall face, thereby allowing safe access for Fire & Rescue Services, and crucially, not providing any additional risk to building occupants.

Industry-leading Technical & On-Site Support

PermaRock understands that it can be a complex process specifying the most suitable external wall insulation system and that many factors can influence system choice and the decorative finish proposed.

High rise buildings present a number of interesting technical challenges; in addition to their fire safety performance they experience greater structural movement and higher wind suction forces than low rise buildings and are less likely to see regular exterior maintenance than their low rise counterparts.

With over 30 years’ experience in the construction industry, PermaRock can provide your project design and construction teams with support on thermal, fire, mechanical and aesthetic performance qualities to help ensure that the performance achieved by the system is to the highest standard.

Support Includes:

- Pre-installation visual surveys of properties
- Photo-realistic scheme visualisations
- Insulation, finish, colour & texture guidance
- Budget costings / ECO funding advice
- Representative and calibrated pull-out tests for system mechanical fixings
- Thermal calculations (Pre and post U-value & condensation risk analysis)
- Standard & bespoke detail drawings (CAD)
- BIM Objects (IFC/Revit)
- Tailored project specification(s) & method statement(s)
- System and colour samples
- Training for Registered Installers
- Availability of local or on-site training for installer(s) and other stakeholders (i.e. client team)
- On-site technical support and monitoring
- Aftercare support

Find out more / Project support

For further information on PermaRock Mineral Fibre EWI Systems or to see examples retrofitted to high rise blocks, please visit www.permarock.com or call PermaRock’s technical support team on 01509 262 924.