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BAR-19-116-S-A-UK
BDA Agrément®
MI RIRI System
Room-In-Roof System

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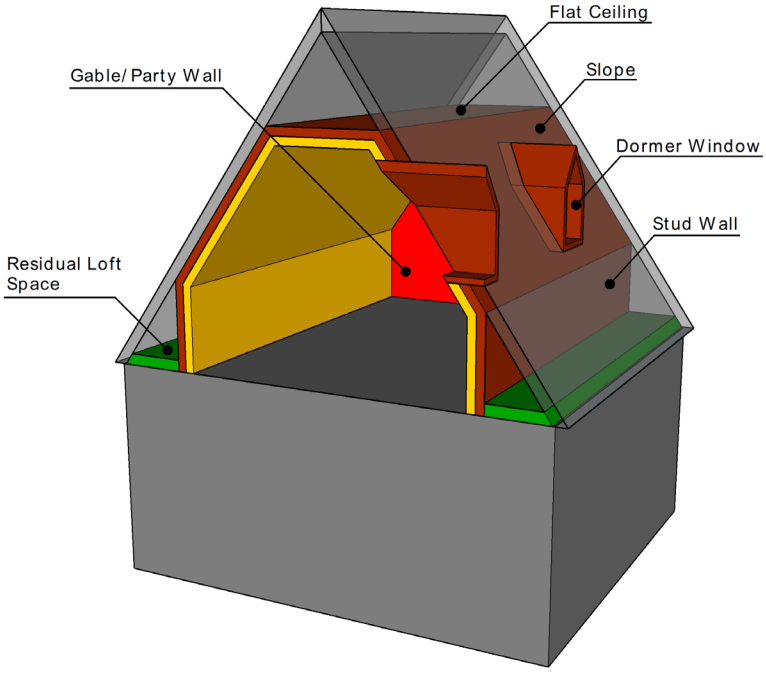
SCOPE OF AGRÉMENT

This Agrément relates to the MI RIRI System (hereinafter the 'System'), a room-in-roof thermal insulation layer and plasterboard lining system. The System is for use as a thermal insulation liner for existing room-in-roof spaces in domestic buildings to enhance the utility of the room-in-roof as a living space. A project-specific System design shall take into consideration existing ventilation and condensation performance. Thermal room elements include masonry gable ends, party walls, common walls, dwarf walls, sloping ceilings, flat ceilings above the roof space, dormer window surrounds and residual loft spaces at the eaves. The System can also contribute to the airtightness of the room-in-roof.

SYSTEM DESCRIPTION

The System comprises a range of flexible and rigid thermal insulation products of various specifications, together with associated fixings, sealant and accessories.

SYSTEM ILLUSTRATION



THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

STATEMENT

It is the opinion of Kiwa Ltd., that the System is fit for its intended use, provided it is specified, installed and used in accordance with this Agrément.

Craig Devine
Operations Manager, Building Products

Alpheo Mlotha CEng FIMMM MBA
Business Unit Manager, Building Products

SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the fitness for the intended use of the System. This Agrément covers the following:

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- System components and ancillary items, points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed System characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

Moisture control - the System (see section 2.2.9):

- has adequate water vapour transmission resistance;
- can contribute to limiting the risk of interstitial and surface condensation.

Fire performance - where 12.5 mm thick plasterboard is included as an integral part of MI Board and MI Reveal, 30-minutes fire resistance is provided in accordance with BS 476-22 (see section 2.2.10).

Thermal performance - the System can improve the thermal insulation of a roof (see section 2.2.11).

Durability - the System will have a service life of 30 years (see section 2.2.12).

UKCA and CE marking - the product manufacturers have responsibility for conformity marking, in accordance with all relevant British and European Product Standards (see section 2.2.13).

CONTENTS

CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations
See section 2.2.

1.1.2 Application
The assessment of the System relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment
Kiwa Ltd. has assessed the System in combination with relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit as appropriate.

1.1.4 Installation supervision
It is recommended that the quality of installation and workmanship is controlled by the Agrément holder.

The System must be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

1.1.5 Geographical scope
The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to Chapter 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity
The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the System within the Scope described. The validity of this Agrément is three years after the issue date, and as published on www.kiwa.co.uk/bda.

1.2 - PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has determined that the Agrément holder fulfils all obligations in relation to this Agrément, in respect of the System.

The initial audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their quality plan. Document control and record-keeping procedures were deemed satisfactory. A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 - ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the System conforms with the requirements of the technical specification described in this Agrément, an Annual Verification Procedure has been agreed with the Agrément holder in respect of continuous surveillance and assessment, and auditing of the Agrément holder's QMS.

CHAPTER 2 - TECHNICAL ASSESSMENT

This Agrément does not constitute a design guide for the System. It is intended as an assessment of fitness for purpose only.

2.1 - SYSTEM COMPONENTS AND ANCILLARY ITEMS

2.1.1 System components included within the scope of this Agrément
The following components are integral to the use of the System:

Item	Description	Dimensions
MI Roll	insulation for horizontal room-in-roof ceilings and residual loft spaces, with thermal conductivity 0.036 W/mK or 0.044 W/mK (dependant on selection) and reaction to fire classification A1	available in thicknesses from 100 to 300 mm
MI Bridge	insulation for exposed timbers in stud walls as a reveal and return insulant, with thermal conductivity 0.035 W/mK and reaction to fire classification A1	20 mm thick
MI Slab	insulation for solid masonry/brick dwarf walls, gable walls and party walls, with thermal conductivity 0.036 WmK and reaction to fire classification A1	80 and 100 mm thick
MI Stud	insulation for studwork dwarf walls, with thermal conductivity 0.032 W/mK or 0.040 W/mK (dependant on selection) and reaction to fire classification A1	available in thicknesses from 50 to 100 mm
MI Board	insulated boarding for sloping room-in-roof ceilings, dormer cheeks and ceilings, studwork dwarf walls and masonry common walls; comprises 12.5 mm thick plasterboard (thermal conductivity 0.190 W/mK) on top of insulation (thermal conductivity 0.022 W/mK); reaction to fire classification B-s1, d0	available in thicknesses from 29.5 to 72.5 mm
MI Reveal	insulated reveal boarding for window reveals, rooflights and standard windows; comprises 12.5 mm thick plasterboard (thermal conductivity 0.190 W/mK) on top of insulation (thermal conductivity 0.015 W/mK or 0.022 W/mK, dependant on selection); reaction to fire classification C-s1, d0	available in thicknesses from 22.5 to 77.5 mm
MI Seal	flexible vapour impermeable mastic sealant	310 ml tube
MI Bridge Fixings	to fix MI Bridge to timbers	3.35 mm diameter by 50 mm long
Stormdry™	water-repellent brick protection treatment, for application to outside of certain solid masonry gable and common walls	-

2.1.2 Ancillary items falling outside the scope of this Agrément
Ancillary items detailed in this section that may be used in conjunction with the System but fall outside the scope of this Agrément:

- fungicidal wash;
- expanded corner bead - expanded metal angle corner bead in accordance with BS EN 10346;
- uPVC profile section;
- fixings - 130 to 150 mm long, to secure MI Slab to masonry;
- 12.5 mm thick plasterboard.

2.2 - POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design responsibility
Project-specific design is the responsibility of an Approved Installer trained and approved by the Agrément holder.

2.2.2 Applied building physics (heat, air, moisture)
A competent specialist shall check the physical behaviour of a project-specific design incorporating the System and if necessary can offer advice in respect of improvements to achieve the final specification. The Specialist can be either a qualified employee of the Agrément holder or a suitably qualified consultant (in which case it is recommended that the consultant Specialist co-operates closely with the Agrément holder).

2.2.3 General design considerations
For a room-in-roof, the height of at least 50 % of any common vertical walls (a vertical continuation of the external wall of the storey below, excluding gable ends or party walls) shall be < 1.8 m.

A room-in-roof shall have permanent stairs leading up to it, which are sufficiently accessible to enable forwards-facing descent.

Existing pitched roofs and walls shall be in a good state of repair, with no evidence of rain penetration, damp, mould, rot, damage, weakness or flaking timbers.

A normal moisture load shall be maintained within the room-in-roof using ventilation, in order that the critical threshold of 95 % RH is not exceeded.

The flat roof space, rafter void and residual loft space shall be adequately ventilated, in accordance with BS 5250, to prevent moisture build-up and condensation. Eaves vents shall be provided for crossflow ventilation so air can travel up one side of a sloping ceiling, across the loft area at the top and back down the other side. It is essential to try to avoid cul-de-sacs of dead air.

There shall be a minimum 50 mm deep ventilation void between the pitched roof insulation and the Type LR breathable underlay, Type HR non-breathable underlay or sarking boards.

Ventilation openings shall be arranged to prevent the ingress of rain, snow, birds and small animals, and the risk of blockage by other building operations.

Room-in-roof space passive ventilation shall be in accordance with BS 5250. Provide adequate trickle ventilation, particularly in rooms expected to experience high humidity.

Care is needed for design detailing of joints at rooflight, gable window, service and flue pipe openings, and shall be in accordance with BS 6093.

The MI Board shall be separated from heat-emitting flue pipes, fixed combustion appliances, fireplaces and chimneys, and any potential source of ignition where the temperature is in excess of 70 °C, by non-combustible insulating material in accordance with the provisions of the national Building Regulations.

The insulation shall be contained by plasterboard lining fixed to rafters and studs, with all the joints mastic sealed and supported by rafters, noggins or studs.

The separating/party wall in semi-detached and terraced dwellings shall achieve a minimum 60-minute fire resistance.
For two adjoining rooms, fire resisting doors (minimum E 20) and partition walls (minimum REI 30) shall be provided.

Suspended upper timber floors shall have adequate fire resistance and fire stopping at penetrations.

The requirement for limiting heat loss through the room envelope, including the effect of thermal bridging, can be satisfied if the thermal transmittance (U-value) of a roof/wall/floor incorporating an appropriate thickness of insulation does not exceed the maximum U-values given in the national Building Regulations.

Care shall be taken in the overall design and construction at junctions with other elements and openings to minimise thermal bridges and air infiltration.

Guidance on linear thermal transmittance, heat flows and surface temperature factors can be found in the documents supporting the national Building Regulations and BS EN ISO 10211, BRE Information Paper IP1/06, BRE Report 262 and BRE Report 497.

2.2.4 Project-specific design considerations
A pre-installation survey is required to allow determination of the project-specific design - see section 2.4.3.

Condensation avoidance requirements
Account shall be taken of air extraction and ventilation requirements in PAS 2030 and PAS 2035.

If there is evidence of severe condensation within the unimproved building, continuous air extraction will be required, in accordance with PAS 2030 and PAS 2035.

A condensation risk analysis shall be performed by the Agrément holder, in accordance with BS 5250 and BS EN ISO 13788 or BS EN 15026.

A WUFI analysis shall be performed on solid wall elements.

Horizontal room-in-roof ceiling space, cross-laid joist insulation, residual loft space
Cross flow ventilation in the roof void above the timber roof members shall be maintained or delivered by:
- slate roof covering (no felt);
- existing eaves or soffit ventilators;
- existing tile/rafter ventilators;
- insertion of new 'easi' vents, tile/rafter ventilators.

Walk board sections measuring 1200 mm by 600 mm are needed to safely access services.

Cross ventilation shall be maintained under walk boards, which shall be raised at least 50 mm above the top layer of insulation.

If existing insulation is less than or equivalent to 100 mm deep, these elements will need further insulation in order to reach a depth of 300 mm.

If the loft area is too small to access, or ventilation issues prevent insulation at the depths required to upgrade the thermal element, then the ceiling shall be over boarded from inside the room-in-roof space.

Horizontal room-in-roof ceiling, dwarf walls - studwork walls
Existing hatches shall be insulated and draughtproofed in accordance with PAS 2030 and CITB 'General Requirements and guidance for the installation of cold roof loft insulation'.

If flat ceiling areas and stud wall have no access, new System access hatch openings will be needed. These shall be located in a position acceptable to the customer.

New hatches shall be fire rated, in accordance with NHBC Technical Guidance document 'Loft hatches and fire resistance'.

Insulation of flat ceilings - traditional loft insulation
All standard loft insulation techniques utilised for flat ceilings and the residual areas of the room-in-roof shall comply with the requirements of PAS 2030 Annex B.9 and CITB 'General Requirements and guidance for the installation of cold roof loft insulation'.

Sloping room-in-roof ceilings
Cross flow ventilation shall be maintained/assured following the installation of a friction fitted insulation layer. Any existing vapour barrier shall be disabled. The existing plasterboard ceiling shall be retained.

Studwork dwarf walls
If access is present or can be formed through studwork walls, the reverse of the studs can be insulated. The exposed heads of studs, soles and plates of the studwork shall be insulated to prevent thermal bridging. If studwork walls are too low to allow an access hatch to be fitted, the walls can be insulated on the internal face.

Masonry common dwarf walls, gable walls
Walls previously insulated with solid or cavity wall insulation do not require further insulation. Uninsulated walls shall be clad with insulation and covered with 12.5 mm thick plasterboard. External brick faces of solid masonry walls in Exposure Zones 3 and 4 may need to be treated with Stormdry™.

Gable walls shall be fully insulated internally where possible, in accordance with PAS 2030 Annex B.8.

Party walls
Solid walls adjoining another heated space do not require further insulation. Where not adjoining a heated space, or where it is not possible to verify, party walls shall be treated as external gable walls, clad with insulation, and covered with 12.5 mm thick plasterboard. Unfilled cavity walls can be insulated using party wall insulation or cavity wall insulation.

Cold party walls shall be fully insulated internally where possible, in accordance with PAS 2030 Annex B.8.

Dormer cheeks and ceilings
Insulate flat dormer ceilings, sloping dormer ceilings and dormer cheeks, if required, with a layer of insulation and covered by a layer of 12.5 mm thick plasterboard.

Roof lights and standard windows
Insulate roof light and standard window reveals using MI Reveal.

A U-value calculation of renovated or new completed roof/wall/floor elements shall be carried out, in accordance with BS EN ISO 6946 (taking into consideration BS EN ISO 10211 and BRE Report 443). Design and declared thermal values can be found in BS EN ISO 10456.

2.2.5 Permitted applications
Only applications designed according to the specifications given in this Agrément are permitted. In each case the Specifier will have to co-operate closely with the Agrément holder.

2.2.6 Installer competence level
The System must be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

Installation shall be by employees trained and approved by the Agrément holder and subject to 1% inspections by Kiwa Ltd. under a Kiwa Installation Assessment & Surveillance Scheme.

2.2.7 Delivery, storage and site handling
The System is delivered to site in suitable packaging, bearing the System name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément.

Store the System in accordance with the Agrément holder's requirements. Particular care must be taken to:
- avoid exposure to direct sunlight for extended periods of time;
- avoid exposure to high or low temperatures for extended periods of time;
- store in a well-ventilated, covered area to protect from rain, frost and humidity;
- store away from possible ignition sources.

Component products shall be protected until ready for use by maintaining wrappings and other protection from the factory.

2.2.8 Maintenance and repair
Once installed, the System does not require regular maintenance provided the weathertightness of the roof and walls is maintained.

For advice in respect of care, usage and repair, consult the Agrément holder's Householder Guide.

Performance factors in relation to the Major Points of Assessment

2.2.9 Moisture control
Water permeability
MI Board and MI Reveal incorporate an insulation component comprised of closed cell structure material and are therefore water-resistant.

Water vapour transmission
MI Board has a low level of water vapour transmission (high water vapour resistance), in accordance with BS EN 13950, and does not favour the accumulation of water vapour between the component and substrate.

Condensation risk
Room-in-roofs incorporating the System will adequately limit the risk of interstitial and surface condensation when designed in accordance with BS 5250 and BRE Report 262.

2.2.10 Fire performance
MI Roll, MI Stud and MI Slab are classified as European Classification A1 (non-combustible), in accordance with BS EN 13501-1.

MI Board is classified as European Classification B-s1, d0 (combustible material of very limited contribution to fire), in accordance with BS EN 13501-1.

Where 12.5 mm thick plasterboard is included as an integral part of MI Board and MI Reveal, 30-minutes fire resistance is provided in accordance with BS 476-22.

The use of the System in pitched roofs shall not affect the external fire exposure classification when evaluated by assessment or test in accordance with BS 476-3.

2.2.11 Thermal performance

The System components offer the following thermal resistance:

- MI Roll - 0.036 W/mK or 0.044 W/mK dependant on selection of insulation;
- MI Slab - 0.036 W/mK;
- MI Stud - 0.032 W/mK or 0.040 W/mK dependant on selection of insulation;
- MI Board - 0.190 W/mK for plasterboard element and 0.022 W/mK for insulation element;
- MI Reveal - 0.190 W/mK for plasterboard element and 0.15 W/mK or 0.22 W/mK for insulation element dependent on selection of insulation.

MI Roll can be used to upgrade residual loft floor spaces and flat ceilings that already have insulation in place to meet current U-value requirements.

The thermal performance of the System is dependent on the U-value calculations of each roof, wall and floor element.

2.2.12 Durability

The System will have a service life durability equivalent to that of the structure into which it is incorporated.

The expected lifespan of the building itself should be at least 30 years.

There is no mould growth risk and the System does not support vermin or insects.

The System is durable, rot-proof and adequately resistant to deterioration and wear by normal service conditions, provided it is installed in accordance with the requirements of this Agrément.

2.2.13 UKCA and CE marking

There is no relevant Product standard for the System.

2.3 - EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Typical sloping ceiling and flat ceiling junction

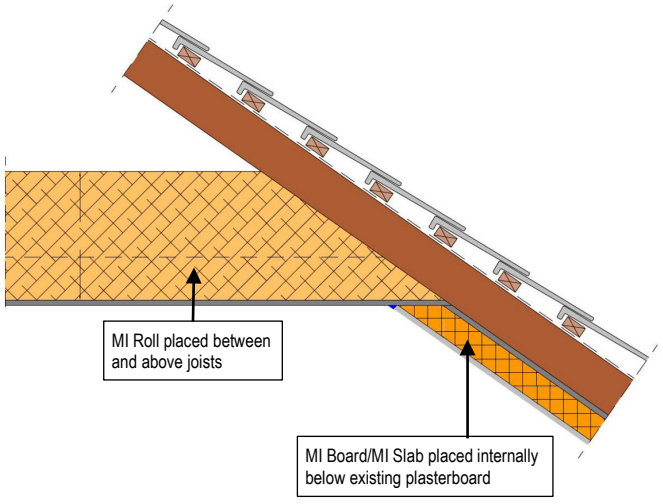


Diagram 2 - Typical flat ceiling and party wall junction

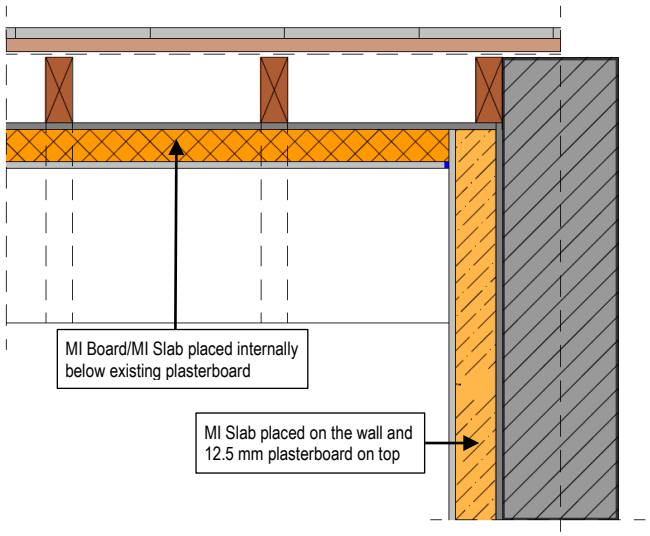


Diagram 3 - Typical sloping ceiling and timber dwarf wall junction

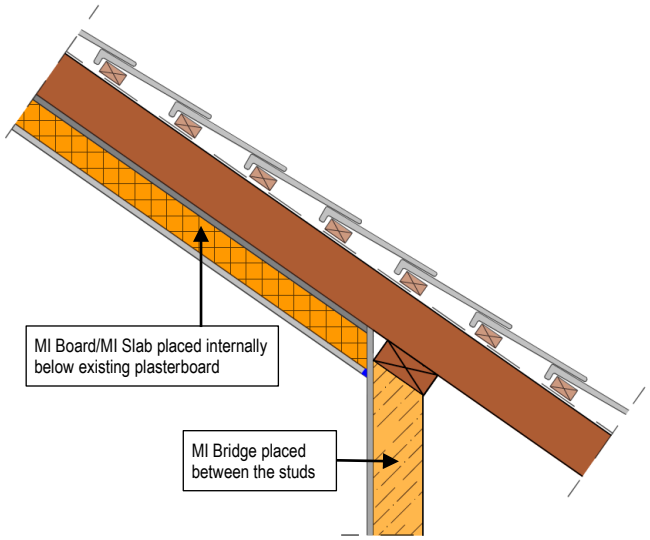
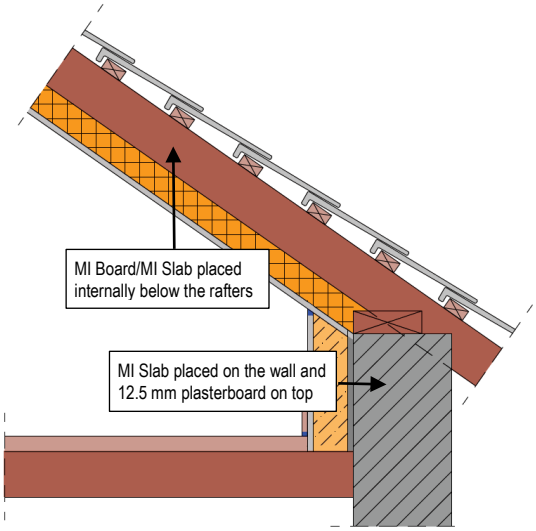


Diagram 4 - Typical sloping ceiling and masonry dwarf wall junction



2.4 - INSTALLATION

The System must be installed strictly in accordance with the instructions (hereinafter 'Installation Manual') of the Agrément holder and the requirements of this Agrément.

2.4.1 Installer competence level
See section 2.2.6.

2.4.2 Delivery, storage and site handling
See section 2.2.7.

2.4.3 Project-specific installation considerations
The project-specific design has been determined from a pre-installation survey. The survey assesses the suitability of a roof for the System, taking into consideration the existing structure, adequacy of ventilation and condensation control measures in place.

Typical inspection checks shall include:
- any existing rain ingress and evidence of damp, mould, staining or condensation on the internal roof rafters, joists and surfaces;
- any holes in the roof or felt;
- existing level of passive and intermittent ventilation for the roof void and room space;
- condition of the envelope timber and masonry wall and any openings;
- any unsuitable/unreliable existing cables, electrical connections and plumbing that need to be altered to facilitate the installation;
- whether an existing vapour control layer (hereinafter 'VCL') exists on the face of the existing plasterboard sloping ceiling exposed to the cold void.

Installation of the System shall be carried out in accordance with:
- BS 8000-0;
- CPA 'Loft Conversion Project Guide';
- CITB 'General Requirements and guidance for the installation of cold roof loft insulation'.

MI Board and MI Reveal shall be protected from naked flames and other ignition sources during and after application.

Where electrical outlets are to be removed for later repositioning, this shall only be carried out by a competent person.

All insulation components shall be cut to provide full and tight-to-edge coverage of that element. All plane junctions formed by the installation of MI Board and MI Slab shall be sealed to each other or an appropriate solid substrate with MI Seal.

All plane edges and component penetrations shall be made airtight using MI Seal, where practicable in accordance with associated references in PAS 2030 and PAS 2035.

Horizontal room-in-roof ceiling space, residual loft space
Any high amperage cables shall remain uncovered by any new insulation and shall be positioned on the upper surface of the MI Roll once installed.

Any exposed pipework, live hot water expansion (HWE) or cold water (CW) storage tanks shall be insulated, in accordance with the relevant Standards.

All amenities within these sections which are more than 1 m away from the stud wall access or loft hatches shall have a walkway installed.

When the ceiling areas behind stud walls are insulated, ensure that all ventilation from the eaves is clear. Ensure that any ventilation coming from sloped ceiling sections where the insulation meets the flat room-in-roof ceiling is not blocked.

Boarding over of horizontal room-in-roof space, sloping ceilings, studwork dwarf walls, masonry dwarf walls
Determine the location of any services behind internal lining surfaces using a multi-detector incorporating live wire and pipework sensors.

Any solid masonry external gable walls and masonry dwarf common walls forming part of a room-in-roof envelope shall be treated externally with Stormdry™.

Ceiling and wall lining board shall be fixed through the insulation to timber rafters or studs with all the joints sealed. Plasterboard shall be fixed using one stainless steel fixing per square metre and polypropylene fixings hammered into the wood/masonry.

Insulation of gable walls and party walls
For internal wall insulation on gable or party walls, consideration shall be given to the interaction and junctures with any other internal insulation method used (e.g. boarding over of sloping ceilings), to ensure there is a continuous insulation envelope with no air gaps.

2.4.4 Preparation
The following works shall be undertaken before the installation of the System:
- make any necessary repairs to roofs and walls, such as replacing damp or broken/rotten timbers;
- repair any damaged or dislodged valleys, gutters, flashings, slates or tiles to make the roof weathertight;
- any timber treatment carried out;
- all surfaces receiving MI Slab or MI Board shall be treated with a fungicidal wash prior to installation to remove any traces of mould growth or spores;
- eaves ventilation shall be cleared of any old insulation that may be blocking the air flow;
- disarm the VCL in existing sloping ceilings by puncturing the plasterboard at 600 mm spacings, if this option is required;
- remove wall mounted fixtures and fittings affixed to the gable or party walls (except for fitted wardrobes which may be fixed to those walls);
- remove any skirting boards, radiators and electrical outlets from studwork dwarf walls (below 600 mm high), masonry dwarf walls and gable walls;
- if the internal face of masonry dwarf walls and gable walls has been finished using the 'dot and dab' plasterboard fixing method, the plasterboard shall be removed. Proud spots created by the 'dot and dab' adhesive shall also be removed to ensure the wall is flat and level.

Access hatches
Where necessary, access hatches into the loft space may be required to allow ingress to the spaces to be insulated. Prior to the installation of an access hatch, create a 150 mm diameter aperture in the plasterboard to allow a manual search of the surrounding area to ensure it is free from obstructions.

Boarding over of sloping ceilings
Rafters shall be inspected from within the horizontal loft space to ensure that air flow gaps are sufficient and free from retrofitted insulation products.

Studwork and masonry dwarf walls
Cut back or remove any carpeting or other floor coverings to allow MI Slab to be sealed to the floorboards once the final plasterboard layer has been installed.

Insulation of residual loft space
Where residual loft spaces can be accessed through existing or newly formed hatches in the studwork dwarf walls, a visual inspection of the areas shall be carried out to check:
- any existing loft insulation depth;
- for the presence of high-amperage cables (e.g. supplying cookers or electric showers);
- if crossflow ventilation is likely to be compromised;
- that high-current cable, vents, ductwork and flues are protected.

Horizontal room-in-roof ceiling space
A visual inspection of the area shall be carried out to check for the presence of either downlighters or high-current cables. If recessed downlighter fittings are present in the ceiling below the loft space, they shall be covered and sealed with protective fire-rated hoods or caps.

Take measures to prevent air leakage around the downlights by sealing in accordance with associated references in PAS 2030 and PAS 2035.

Additional ventilation and moisture control measures
If further window trickle vents and/or intermittent extraction fans are required, these shall be fitted to provide the room requirements as specified in PAS 2030 and PAS 2035.

2.4.5 Outline installation procedure
The detailed installation sequence can be found in full in the Agrément holder's Installation Manual.

The key sequence for installation is:

Horizontal room-in-roof space and residual loft space
Install MI Roll to a depth of not less than 300 mm to all horizontal areas, cross-laid and tightly butted, to ensure joist heads are covered.

Insulate any exposed pipework or water storage tanks, in accordance with the relevant Standards.

Sloping room-in-roof ceilings
Retain the existing ceiling plasterboard covering:
- establish the location of rafters beneath the existing plasterboard to ensure correct fixing alignment of MI Board sections;
- MI Board or MI Slab shall be:
  - cut to size, ensuring angles between the sloping ceiling and both horizontal and dwarf walls are cut to ensure a tight fit;
  - fitted over the entire sloping ceiling and fixed using appropriate fixings;
- cover with a layer of 12.5 mm thick plasterboard;
- seal any penetrations and all plane edges with MI Seal.

Studwork dwarf walls - insulation applied to rear face of studs
Friction fit MI Stud between studwork members.

Cut MI Bridge strips to length, allowing for a 50 mm overlap on either side of the exposed timber studwork heads to prevent cold bridging.

Pin strips of MI Bridge to timbers using MI Bridge fixings, ensuring the strips overlap the previously fitted MI Stud by 50 mm either side of the timber heads.

Studwork dwarf walls - insulation applied to front face of studs
Cut MI Board or MI Slab to size, ensuring angles between dwarf wall, floor boards and sloping ceiling are cut to ensure a tight fit.

Mark the position of any pattress boxes on the MI Board or MI Slab and drill to allow the penetration of associated wiring to be brought forward.

Fix the MI Board or MI Slab to the dwarf wall using appropriate fixings, ensuring any cables to be brought forward are fed through the pre-drilled holes.

Create a recess in the MI Board or MI Slab allowing any pattress boxes to be fixed into place, ensuring a minimum of 20 mm of insulation remains beneath the box to prevent cold bridging.

Seal skirting boards at junctions with floorboards, any penetrations, and all plane edges using MI Seal to prevent air leakage.

Masonry gable, party and common dwarf walls
Remove and set aside any skirting boards, radiators and electrical outlets.

If the internal face of the wall has been finished using the 'dot and dab' plasterboard fixing method, the plasterboard and adhesive shall be removed to ensure the wall is flat and level.

Mark the position of any pattress boxes on the MI Slab and drill to allow the penetration of wiring to be brought forward.

Cut the MI Slab to size and fix to the wall using appropriate fixings, one to each corner of each slab or section, a maximum of 100 mm from slab edges, ensuring any cables to be brought forward are fed through the pre-drilled holes.

Create a recess in the MI Slab allowing any pattress boxes to be fixed into place, ensuring a minimum of 20 mm of insulation remains beneath the box to prevent cold bridging.

Fix 12.5 mm thick plasterboard to entire face of MI Slab using appropriate fixings.

Seal skirting boards at junctions with floorboards, any penetrations, and all plane edges using MI Seal to prevent air leakage.

Dormer cheeks and ceilings
Dormer cheeks and ceilings shall be insulated using MI Board or MI Slab, following the same installation procedure as detailed above for sloping room-in-roof ceilings.

MI Board or MI Slab shall be fitted to the stud wall beneath the dormer window. Where the window cill protrusion is insufficient, the cill shall be extended using a uPVC profile section.

All external angles created between the dormer cheeks, sloping ceilings and dormer ceilings shall be protected using expanded metal angle beads.

Seal any penetrations and all plane edges using MI Seal to prevent air leakage.

2.4.6 Finishing
The following finishing is required on completion of the installation:
- for studwork dwarf walls (below 600 mm high), masonry dwarf walls and gable walls, apply a full skim coat of plaster to the extent of the wall. Alternatively, tape and joint the board joints;
- apply tape and jointing compound to plasterboard joints of flat and sloping plasterboard lining. Apply a full skim coat of plaster or plaster over the sloping room-in-roof ceiling, dormer cheeks and ceilings, roof light and standard window reveals, using expanded galvanised angle beading to protect external corners;
- re-fit or replace skirting boards and radiators;
- re-fit wall-mounted furniture to the gable or party walls ensuring the fixings used penetrate the insulation system and fix into the substrate;
- loft warning signs may be required in the residual loft space and horizontal room-in-roof ceiling space.

2.5 - INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.5.1 Moisture control

Test	Standard	Result			
		MI Slab	MI Board	MI Stud	MI Roll
Water vapour transmission	BS EN 12086, Method A	MU1	-	-	-
Water vapour resistance (m^2sPa/kg)	BS EN 13950	-	1-3 x 10^{11} to 0.5-1.5 x 10^{11}	-	-

2.5.2 Fire performance

Test	Standard	Result			
		MI Slab	MI Board	MI Stud	MI Roll
Reaction to fire classification	BS EN 13501-1	A1	B-s1, d0	A1	A1

2.5.3 Thermal performance

Test	Standard	Result			
		MI Slab	MI Board	MI Stud	MI Roll
Declared aged thermal conductivity (λ_D) (W/mK)	BS EN 12667	0.036	0.022^, 0.190^^	0.040^^^	0.044^^^

^ for PIR insulation
^^ for plasterboard
^^^ depending on the exact insulation used, this λ_D may be improved

CHAPTER 3 - CDM, NATIONAL BUILDING REGULATIONS AND THIRD-PARTY ACCEPTANCE

3.1 - THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015 AND THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (NORTHERN IRELAND) 2016

Information in this Agrément may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

3.2 - THE NATIONAL BUILDING REGULATIONS

In the opinion of Kiwa Ltd., the System, if installed and used in accordance with Chapter 2 of this Agrément, can satisfy or contribute to satisfying the relevant requirements of the following national Building Regulations.

3.2.1 - ENGLAND
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the roof incorporating the System can adequately protect a building from condensation
- J4 Protection of building - the System can be separated from hot appliances and surfaces, to prevent a building catching fire
- L1(a)(i) Conservation of fuel and power - the System can limit heat gains and losses through a roof
- Regulation 7(1)(a) Materials and workmanship - the System components are manufactured from suitably safe and durable materials for their application and can be installed to give satisfactory performance
- Regulation 23(1) Requirements relating to thermal elements - the System can contribute to a wall complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the System can contribute to a building to not exceed its CO_2 emission rate
- Regulation 26A Fabric energy efficiency rates - the System can contribute to satisfying this Requirement

3.2.2 - WALES
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2(c) Resistance to moisture - the roof incorporating the System can adequately protect a building from condensation
- J4 Protection of building - the System can be separated from hot appliances and surfaces, to prevent a building catching fire
- L1(a)(i) Conservation of fuel and power - the System can limit heat gains and losses through a roof
- Regulation 7(1)(a) Materials and workmanship - the System components are manufactured from suitably safe and durable materials for their application and can be installed to give satisfactory performance
- Regulation 23(1) Requirements relating to thermal elements - the System can contribute to a wall complying with the requirements of L1(a)(i)
- Regulation 26 CO_2 emission rates for new buildings - the System can contribute to a building to not exceed its CO_2 emission rate
- Regulation 26A Primary energy consumption rates for new buildings - the System can contribute to satisfying this Requirement
- Regulation 26B Fabric performance values for new dwellings - the System can contribute to satisfying this Requirement

3.2.3 - SCOTLAND
THE BUILDING (SCOTLAND) REGULATIONS 2004 AND SUBSEQUENT AMENDMENTS

3.2.3.1 Regulation 8(1) Durability, workmanship and fitness of materials

- The System is manufactured from acceptable materials and is adequately resistant to deterioration and wear under normal service conditions, provided it is installed in accordance with the requirements of this Agrément

3.2.3.2 Regulation 9 Building standards - construction

- 3.15 Condensation - the roof incorporating the System can contribute to limiting surface or interstitial condensation
- 3.19 Combustion appliances - relationship to combustible materials - the System can be separated from hot appliances and surfaces to prevent damage to a building
- 6.1(b) Carbon dioxide emissions - the System will contribute to energy conservation of a building
- 6.2 Building insulation envelope - the System will contribute to the insulation envelope to resist thermal transfer
- 7.1(a)(b) Statement of sustainability - the System can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the System can contribute to a construction meeting a higher level of sustainability as defined in this Standard

3.2.3.3 Regulation 12 Building standards - conversion

- All comments given under Regulation 9 also apply to this Regulation, with reference to Schedule 6 of The Building (Scotland) Regulations 2004 and subsequent amendments, clause 0.12 of the Technical Handbook (Domestic) and clause 0.12 of the Technical Handbook (Non-Domestic)

3.2.4 - NORTHERN IRELAND
THE BUILDING REGULATIONS (NORTHERN IRELAND) 2012 AND SUBSEQUENT AMENDMENTS

- 23(1)(a)(b) Fitness of materials and workmanship - the System is suitable and can be adequately prepared and applied
- 29 Condensation - the System can contribute to limiting interstitial condensation in a building
- 39(a)(i) Conservation measures - the System will limit heat gains and losses through a roof
- 40(2) Target carbon dioxide emission rate - the System will contribute to a building to not exceed its target CO_2 emission rate
- 73(1)(b) Protection of people and buildings - the System can be separated from hot appliances and surfaces to prevent damage to a building by heat or fire

3.3 - THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

CHAPTER 4 - SOURCES

- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- BS EN ISO 10211:2017 Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations
- BS EN ISO 10456:2007 Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values
- BS EN ISO 13788:2012 Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation. Calculation methods
- BS EN 10346:2015 Continuously hot-dip coated steel flat products for cold forming. Technical delivery conditions
- BS EN 12086:2013 Thermal insulating products for building applications. Determination of water vapour transmission properties
- BS EN 12667:2001 Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
- BS EN 13950:2014 Gypsum board thermal/acoustic insulation composite panels. Definitions, requirements and test methods
- BS EN 15026:2023 Hygrothermal performance of building components and building elements. Assessment of moisture transfer by numerical simulation
- BS 476-3:2004 Fire tests on building materials and structures. Classification and method of test for external fire exposure to roofs
- BS 476-22:1987 Fire tests on building materials and structures. Method for determination of the fire resistance of non-loadbearing elements of construction
- BS 5250:2021 Management of moisture in buildings. Code of practice
- BS 6093:2006+A1:2013 Design of joints and jointing in building construction. Guide
- BS 8000-0:2014+A1:2024 Workmanship on construction sites. Introduction and general principles
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2019 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for calculating linear thermal transmittance and temperature factors
- CITB guide: General Requirements and guidance for the installation of cold roof loft insulation: 2013
- CPA Loft Conversion Project Guide:2010
- HSE Approved Codes of Practice
- NHBC Technical Guidance Document for Loft Hatches and Fire Resistance:2006
- PAS 2030:2023 Installation of energy efficiency measures in existing dwellings. Specification
- PAS 2035:2023 Retrofitting dwellings for improved energy efficiency. Specification and guidance

Remark: apart from these sources, technical information and confidential reports have been assessed; any relevant documents are in the possession of Kiwa Ltd. and kept in the Technical Assessment File of this Agrément. The Installation Manual for the System may be subject to change, and the Agrément holder should be contacted for clarification of revisions.

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment description	Amended by	Approved by	Date
-	First Issue	C Vurley	C Forshaw	April 2020
A	Amendments during project 3188	C Devine	C Vurley	September 2021
B	Change of System owner	C Devine	C Vurley	January 2022
C	Re-issue following successful 3 Year Renewal; clarification of System components	E Taylor	C Devine	January 2024
D	Addition of mineral wool insulation	A Tsourlini	C Devine	January 2026

CHAPTER 6 - CONDITIONS OF USE

This Agrément may only be reproduced and distributed in its entirety.

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