



# Specification & Installation Guidance for Retro-Fit Room in the Roof Insulation

November 2021



**swipRIR**  
*Keeping the home warm!*

# The Importance of wall insulation in houses



**Retrofit room in roof insulation is established as a common energy efficiency measure in the domestic sector. This guide is intended to supplement Annex B12 of PAS2030:2019 to offer more specific advice.**

This document identifies the main viable methods that can be deployed and seeks to offer guidance on appropriate installation techniques.

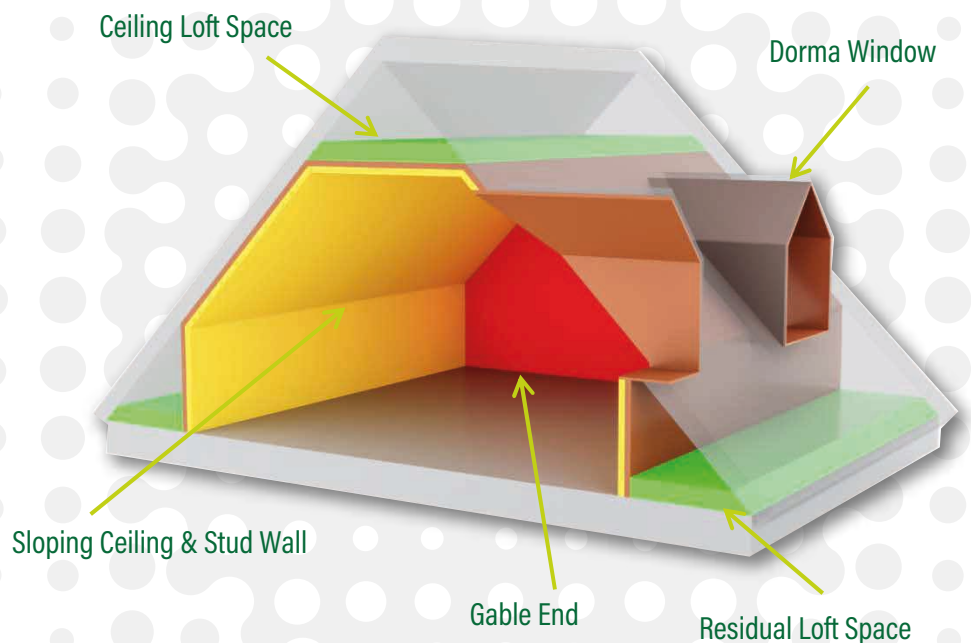
Installers should ensure that they continue to work to all other required standards, including building regulations and manufacturers / systems designer guidance.

This document is intended as a guide to assist parties involved in the delivery of retrofit ROOM IN ROOF insulation to complete installations in line with the requirements of PAS2030:2019 and other relevant standards and regulations. It is intended to complement PAS2030:2019 and is not specific to any additional requirements which may need to be fulfilled in order to be compliant with specific funding schemes such as the Energy Companies Obligation (ECO).

The components that form the thermal envelope of the ROOM IN ROOF typically comprise.

## Thermal Envelope Diagram

- Stud Walls
- Common Wall
- Sloping Ceilings
- Flat Ceiling
- Gable End
- Party Walls
- Dormer Windows
- Loft Space



# System Materials / Products which falls within the scope of this guidance



## Insulation Board

### XtraTherm Thin-R Insulation XtraTherm Thin -R Pitched Roof board



The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13165 : 2012. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

The management system of Xtratherm UK Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008, BS EN ISO 14001 : 2004 and OHSAS 18001: 2007 by BRE (Certificates 718, 718EMS and 718-HS respectively)

**Thermal performance** — the product has a declared thermal conductivity (OD) of 0.022 W / (m K)

Table 1 Nominal characteristics

Characteristic (unit)	Value
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25 to 165 (in 5 mm increments)
Minimum compressive strength* at 10% compression (kPa)	150
Edge profile	Square, tongue-and-groove, rebated

**Plasterboard** - GTEC dB Board (Gypsum Plasterboard Types D and I) 2. No. UKSI-00520-007 Intended use/es: General building construction 3. Harmonised standard: BS EN 520:2004+A1:2009

Essential characteristics	Performance	Harmonised Technical Specification
Flexural strength	Transverse:      Longitudinal: 12.5mm      ≥210N      ≥550N 15mm      ≥250N      ≥650N	EN 520:2004+A1:2009
Shear Strength	NPD	
Reaction to fire	Euroclass A2-s1,d0	EN 520:2004+A1:2009
Airborne Sound Insulation	see literature	
Acoustic Absorption	see literature	
Water vapour permeability (μ)	10	EN 12524:2000
Thermal resistance	0.25 W/m.K	EN 12524:2000
Impact Resistance	see literature	

# Overview of System



The system is for use as an insulated dry lining for ROOM IN ROOF applications, in new and existing dwellings or building

The SWIP ROOM IN THE ROOF (RIRI) Insulation system is comprised of a ridged polyisocyanurate-modified polyurethane foam board Insulation board which is pre bonded to Plasterboard (SWIP RIR Board). The board is available in a variety of thicknesses to achieve a range of U-values.

The SWIP RIR Board is mechanically fixed through the existing plasterboard into the existing timber rafters on the sloping section of the roof, and also the vertical stud walls. **See thermal Envelope Diagram:**

## Avoiding Cold Bridging:

To avoid cold bridging use the SWIP 12.5mm and 27mm Reveal Boards.

The SWIP 12.5mm Reveal Board comprises of 10mm insulation with a 2.5mm cementitious screed, whilst the SWIP 27mm Reveal Board is an insulated plasterboard.

The use of these boards should be for areas of potential cold bridging such as window reveals, Dormer cheeks, ceilings, restricted staircases and any other areas of limited space.

Loft Roll Insulation is recommended in the loft area's adjacent to the stud wall residual loft space, also insulation should be used to treat the ceilings loft space. Depending on space limitation, the maintenance of ventilation and practicality of install, Loft Roll Insulation is one option to treat this area.

Alternatively, the SWIP RIR Board can be mechanically fixed through the existing plasterboard and timbers at ceiling level. **See thermal Envelope Diagram:**

## Surveying and Suitability for Room in the Roof Installation

Examples of circumstances when it would not be appropriate to proceed with an installation without further remedial work, when there is existing evidence of any of the following;

- **Damp and mould on rafters and joists**
- **Damp plasterboard**
- **Wood rot**
- **Holes in the roof or felt**
- **Signs of water penetration on timbers and wall areas**
- **Timbers that are flaking and weak**
- **Signs of condensation on surfaces in the cold loft space**
- **Unsuitable Existing cables and electrical connections**
- **Bats or other protected species present in the roof space**

# Ventilation Required



- Without proper ventilation, a property could suffer from condensation issues after insulation has been installed in a ROOM IN ROOF. It is therefore essential that ventilation is either maintained or enhanced (where required).
- In a ROOM IN ROOF, crossflow ventilation is achieved when air can travel up one side of a sloping ceiling, across the loft area at the top and back down the other side.
- Where a ceiling is vaulted, there is no crossflow ventilation between the two sloped areas, so additional ventilation measures must be undertaken to ensure adequate ventilation is provided.
- Guidance on ventilation requirements should be reviewed in PAS2030:2019 5.2.4, PAS2035:2019 Annex C and also the 'General requirements and guidance for the installation of cold roof loft insulation' CITB Version 2.

## Sloping Ceilings and Crossflow Ventilation

It is very important to ensure crossflow ventilation around the ROOM IN ROOF at all times to prevent condensation. Eaves ventilation must be cleared of any old insulation that may be blocking the air flow. Figure 1 illustrating blocked eaves.

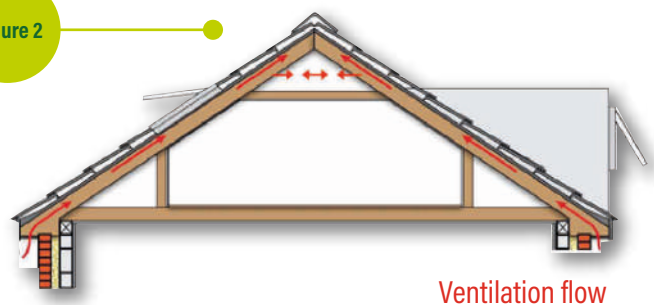
### Example Room in Roof -

showing cross flow ventilation to an Untreated ROOM IN THE ROOF

Figure 1



Figure 2



## Pre-Installation requirements: Combustion Appliances

When installing insulation to the ROOM IN ROOF you are responsible for the ventilation requirements for all existing fuel burning appliances within the ROOM IN ROOF. If a fuel burning appliance is present, this should be assessed by a competent person to determine whether the pre-existing ventilation and subsequent post installation requirements are sufficient or further remedial works are required.

Works **MUST NOT PROCEED** unless a competent person has deemed the fuel burning appliance to have sufficient ventilation or any associated remedial actions (such as the installation of new vents) has been completed and approved by person competent to do so.

# Additional Considerations



- The existence and safe operation of down-lighters and other light fittings is considered and treated in line with the current guidance in the General requirements and guidance for the installation of cold roof loft insulation' CITB Version 2.
- An appropriate sealing method is utilised which does not compromise the safe use of the fitting, but allows compliance with the Continuity of Insulation and Air Tightness requirements in the Building Regulations and associated references in PAS2030:2019
- The CITB guide should also be referred to in relation to dealing with high current carrying cables (e.g.. electric shower cables and electric cooker cables which could also be present in this area) [www.citb.co.uk](http://www.citb.co.uk)
- Installation should be in accordance with BS 8212: 1995, good dry lining practice. Before fixing the system, sufficient time must be allowed for damp proofing treatments, where applied, to dry out (see also BS 6576: 2005 for dry lining in conjunction with a chemical DPC application).
- The system can be cut using a fine-toothed saw to fit around windows, doors and air bricks. It is essential that cut pieces completely fill the spaces for which they are intended and are adequately secured and appropriately sealed.
- Cutting should be done in a ventilated space, outside or in an area with a dust extraction system.
- A qualified plumber is required to make alterations to heating systems.
- A qualified electrician must be used to make good the electrical wirings and services. Non-electricians may be permitted to bring forward services such as sockets and switches if sufficient cabling allows and the appliance is not disconnected.
- Identify all live or used balanced flues, mechanical vents, etc. Carefully remove the flue terminal / duct cowl and fix suitable metal or PVC sleeving / trunking to extend the flue / ducting beyond the surface of the proposed insulation system. This needs to be completed by a compliant person.
- Securely re-fix all terminals, cowls, etc. Ensure all work is carried out to the recommendations of the PAS2030 Fuel Burning Appliance Document and Gas Safety Regulations. This needs to be completed by a compliant person.
- We recommend the document "A Guide to Retrofit Room in Roof Insulation 2017 V1.0" produced by ATMA & the NIA is also reviewed in conjunction with the SWIP Specification & Installation Guidance. [www.nia.org](http://www.nia.org)

# Room in Roof Thermal Envelope



ROOM IN THE ROOF insulation installation should be carried out in accordance with Building Regulation Approved Document Part L1B The Conservation of Fuel & Power in Existing Dwelling.

The target U-values that should be achieved are those presented in Table 3 - Upgrading Retained Thermal Elements. The following table 3 gives guidance on what to do in circumstances where this is not achievable.

Where technically, functionally and economically possible the U-values in Table 3 of Building Regulations Approved Document Part L1b overleaf should be met. It is commonly accepted that where it is not possible to reach the target U-value, the standard met should reach the Threshold U-value as a minimum which takes into account area-weighted value

**Table 3 Upgrading retained thermal elements**

Element <sup>1</sup>	(a) Threshold U-value W/(m <sup>2</sup> ·K) <sup>8</sup>	(b) Improved U-value W/(m <sup>2</sup> ·K) <sup>8</sup>
Wall – cavity insulation <sup>2</sup>	0.70	0.55
Wall – external or internal insulation <sup>3</sup>	0.70	0.30
Floor <sup>4,5</sup>	0.70	0.25
Pitched roof – insulation at ceiling level	0.35	0.16
Pitched roof – insulation between rafters <sup>6</sup>	0.35	0.18
Flat roof or roof with integral insulation <sup>7</sup>	0.35	0.18

1 'Roof' includes the roof parts of dormer windows and 'wall' includes the wall parts (cheeks) of dormer windows.

2 This applies only in the case of a wall suitable for the installation of cavity insulation. Where this is not the case, it should be treated as 'wall – external or internal insulation'.

3 A lesser provision may be appropriate where meeting such a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall.

4 The U-value of the floor of an extension can be calculated using the exposed perimeter and floor area of the whole enlarged building.

5 A lesser provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor levels.

6 A lesser provision may be appropriate where meeting such a standard would create limitations on head room. In such cases, the depth of the insulation plus any required air gap should be at least to the depth of the rafters, and the thermal performance of the chosen insulant should be such as to achieve the best practicable U-value.

7 A lesser provision may be appropriate if there are particular problems associated with the load-bearing capacity of the frame or the upstand height.

8 Area-weighted average values.

# Installation of Access Points to loft areas



If there is already access into the stud wall areas and flat ceiling area, you may not need to install a new access. If these areas have no access, you may need to provide a new access hatch.

When installing these new openings, this should be done in accordance with relevant Building Regulations.

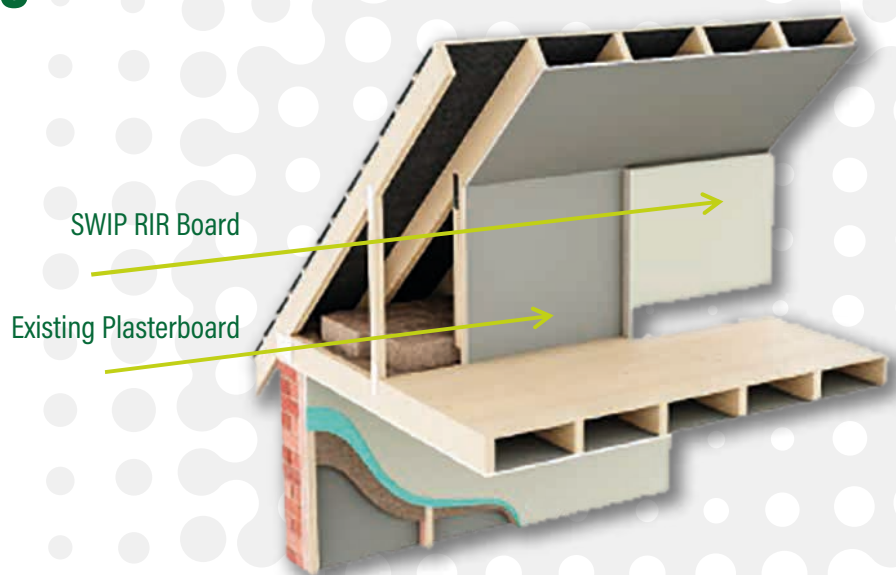
If the access is to be permanent, ensure the position is acceptable to the customer.



## Timber Stud Walls

### Option 1

SWIP RIR Board can be mechanically fixed with 100mm fixings through the existing plasterboard in the existing timbers at 300mm centres





# Timber Stud Walls

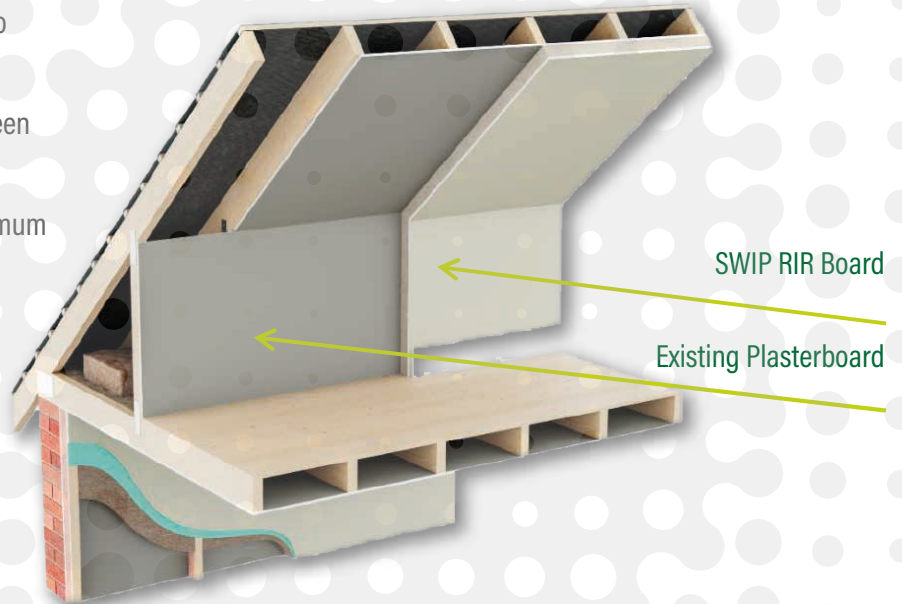


## Option 2

By accessing behind the timber studs adjacent to the residual loft space and insulating with Glass Mineral Fibre Roll or Slab can be friction fit between the rear of the timber studs and secured with insulation netting. (This should achieve the minimum U-value requirement as per building regulation)

## Sloping Ceiling / Pitched Roof

SWIP RIR Board can be mechanically fixed with 100mm fixings through the existing plasterboard in the existing timbers at 300mm centres



## Considerations of the Gable End or Party Walls

All elements of the heat loss envelope of the room should be fully insulated where possible. Depending upon the wall type, the technique deployed may be;

- Cavity Wall and Party Wall Insulation (Refer to PAS2030:2019 Annex B.1)
- External Wall Insulation (Refer to PAS2030:2019 Annex B.4)
- Internal Wall Insulation (Refer to PAS2030:2019 Annex B.8)

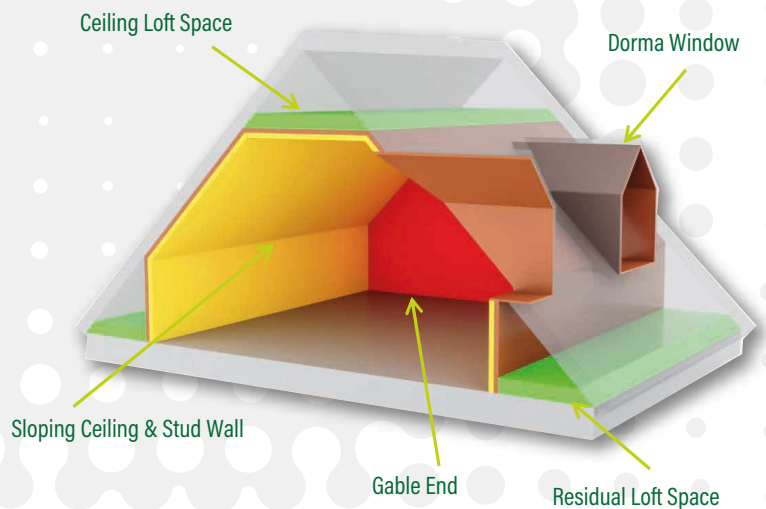
Where Internal Wall Insulation is utilised on gable or party walls, consideration should be given to the interaction and junctures with any other internal insulation method used (e.g. over boarding of sloping ceilings) to ensure that there is a continuous insulation envelope with no air gaps and that neither products performance is compromised.

# Installation of insulation for Gable End Walls



For the installation of insulation onto a gable end wall use the SWIP 95mm or 65mm Internal Wall Insulation system, consisting of high-performance extruded polystyrene and Oriented Strand Board (OSB) studs, mineral wool insulation slab and vapour control membranes.

For further information and installation guidance, please refer to the SWIP Internal Wall Insulation (IWI) Design Guide.



## Installation of insulation for Party Walls

Party Walls are not specifically listed in Table 3 of Part L1B.

The methodology to determine insulation levels required should be as follows: Identify if the party wall is adjoining another heated space.

- A. If it is not adjoining a heated space treat as an external wall and insulate in line with Building Regulations.
- B. If it is a heated space, then there is no requirement for the wall to be treated with insulation as in this scenario this is not classified as a heat loss wall.
- C. If it is a solid wall then no need to take any measures apart from restricting thermal bridging at the perimeter ii. if it is an unfilled cavity wall then this can be insulated using party wall insulation or CWI as appropriate.

# Installation of insulation for Party Walls



Party walls adjacent to a roof are defined as either a cold roof or a heated space when the installation of a Room in Roof system is being considered.

A cold roof would be defined where the insulation is at the ceiling level, therefore just loft insulation has been used within the roof space, as well as not meeting the Room in Roof criteria, set out below. A heated space (adjacent Room in Roof) must meet the Room in Roof criteria below.

RdSAP Conventions for RdSAP 9.92 issued 12 August 2016 (v9.0) states that a room in roof must be accessed via a permanent fixed staircase such that one is able to walk down facing forwards. For a roof room to be classed as such and not as a separate storey, the height of the common wall must be less than 1.8 m for at least 50% of the common wall (excluding gable ends or party walls). The common wall is a vertical continuation of the external wall of the storey below.

If the adjacent roof space meets the Room in Roof criteria, then in accordance with the Building Regulations, this wall area would not need any insulation treatment as it is not defined as a heat loss wall. Insulation solution for being adjacent to a cold roof.

If the party wall is defined as being adjacent to a cold roof then one of following three solutions are acceptable.

1. SWIP 95mm Internal Wall Insulation system
2. SWIP 27mm Insulated Reveal Boards, with a full bed of adhesive and regularly mechanically fixed for fire purposes.
3. SWIP 12.5mm Insulated Reveal Boards, with a full bed of adhesive and regularly mechanically fixed for fire purposes.

## Dorma / Sloping Window Detail

In many cases there may be space limitation on the heads, cills, jambs, in relation to dorma & sloping window sections within a ROOM IN THE ROOF. Where unfeasible / impractical a 27mm or 12.5mm Insulated Reveal Board can be utilised to provide an uplift in thermal performance and reduce the risk of condensation by reducing the cold bridging.

### Insulation of Pipes & Tanks

All pipework and water tanks should be insulated in line with the CITB guide: 'General requirements and guidance for the installation of cold roof loft insulation' CITB Version 2.

These MUST BE insulated within the flat ceiling section and residual loft areas, regardless of whether that area of loft has been newly insulated, as a new cold loft space has been created. All amenities within these sections which are more than 1m away from the stud wall access or loft hatch should have a walkway installed.



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