

SPECIFICATION & INSTALLATION GUIDANCE FOR RETROFIT INTERNAL WALL INSULATION

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INTERNAL WALL INSULATION

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THE IMPORTANCE OF SOLID WALL INSULATION

Buildings account for 40% of our energy consumption, and in domestic properties the majority of this energy is lost through the building fabric elements (walls, roofs, etc). Therefore, insulating external walls is one of the most cost-effective energy efficiency improvements that can be made to a domestic property.

Solid walls can lose even more heat than cavity walls. Typically, 35% of the total heat loss of an uninsulated solid wall house is lost through the external walls. Although insulating solid walls can be more expensive than cavity wall insulation, higher savings can be achieved saving the occupant up to £550 a year*, providing a quicker payback than cavity wall insulation.

**Energy Saving Trust, 2025*



WHY INSULATE SOLID WALL PROPERTIES

Over a quarter of the UK's CO2 emissions are generated by our homes. Of the estimated 25 million homes in the UK approximately 36% have been labelled as "hard-to-treat", the majority of which are solid walled properties. Insulating all the solid wall properties in the UK would provide significant reductions in the amount of CO2 we emit and would also help to reduce the occupant's fuel bills.

Save Money on Energy Bills.

A poorly insulated home will cost the occupant significantly more in heating bills than a fully insulated property. Insulation slows the transfer of heat, therefore reducing the amount of energy consumption in the home, which in turn reduces energy bills as well as keeping the home warmer in winter.

Eradicate Fuel Poverty.

50% of solid wall properties are occupied by people living in fuel poverty, which can have a significant impact on people's health and quality of life. Fuel poverty can particularly affect the elderly, children, and the disabled, and Britain is said to have the highest number of avoidable deaths due to winter cold in Western Europe. So, by insulating solid wall properties we can improve people's quality of life and even help prevent unavoidable deaths.

Help Reduce CO2 Emissions.

By insulating the solid walls in these properties, the environmental impact of providing space heating is significantly reduced. It is estimated that an insulated solid wall home could save approximately 2 tons of CO2 per year when compared to a property that is poorly insulated.*

Increase a Home's Value.

Insulating a solid wall property can add to a home's market value by significantly improving its Energy Efficiency Rating.

Energy Saving Trust May 2012*

Reduced energy bills

**Eradication of
fuel poverty**

**Reduced CO2
emissions**

Increase home's value

SOLID WALL INSULATION

Internal Wall Insulation (IWI).

There are several reasons why internal wall insulation may be preferred to external wall insulation for insulating solid masonry walls:

- It costs less to install than external insulation.
- It is easier to maintain than external insulation.
- No scaffolding is required.
- The external appearance of the building is maintained so it can be installed in conservation areas.
- Materials are readily available.
- It can be installed on a room-by-room, single façade or whole-house basis.
- Installation is not delayed by bad weather.

Thermal Comfort.

An internal wall insulation system enables comfortable room temperatures to be achieved quicker than with an external wall insulation system. Warming up time periods are reduced, which in turn reduces heating costs, particularly in intermittently heated buildings such as domestic dwellings.

Taking the Opportunity.

An ideal opportunity to install internal insulation on a solid wall is when other work is already required:

- When existing plaster is crumbling and needs replacement.
- When the decorative finish is being removed.
- When rewiring or installing central heating.
- During total refurbishment.

The existing walls should be examined prior to install and any remedial work - the insertion of a damp proof course or the repair of overflowing guttering - should be carried out before the insulation system is installed. It is important that the internal insulation system is not used to hide or isolate damp or wet walls.

Taking advantage of an opportunity to improve the energy efficiency of a dwelling and upgrading uninsulated external walls provides several benefits including:

- Reduced CO2 emissions.
- Reduced fuel bills.
- Increased thermal comfort for the occupiers.
- Reduced risk of condensation and mould growth.
- Reduction in fabric damage and maintenance costs.

Combination Installations.

In some scenarios, the optimum solution may be to install a combination of both external and internal wall insulation. For example, an EWI system may suit the back of a house, where appearance is less important, and the front of the house can be insulated with the SWIP IWI System, which maintains aesthetic quality of the existing facade, while delivering high levels of thermal performance and a flexible installation solution.



IWI System



About the SWIP IWI System

SWIP Internal Wall Insulation (IWI) provides a system-based approach to internal wall insulation. The system has been tested and certified to demonstrate that all components work together as designed to deliver the required performance. The SWIP IWI System is designed for insulating existing solid (or uninsulated cavity) external walls and consists of thermally engineered composite studs, insulation slabs, and a Vapour Control Layer.

Our standard IWI systems are 95mm and 65mm in thickness but these can be combined to provide a greater thickness of high performance thermal insulation and, consequently, a greater U-value.

Traditional internal wall insulation, which uses timber or metal studs, leads to thermal bridging through the studs, which needs to be compensated for by increasing the thickness of the overall system. The innovative use of the thermally insulated SWIP Studs within the SWIP system prevents this and results in an overall thinner system.

SWIP IWI System Components.

SWIP IWI 65mm/95mm Studs - Extruded polystyrene bonded to Oriented Strand Board (OSB).

SWIP EcoBatt Insulation - Water-repellent glass mineral wool slab.

Sealant - SWIP multi-purpose sealant.

Adhesive tapes - Foil, Tescon Vana, Contega Solido.

Fixing to masonry - SWIP IWI 120mm/150mm fixings in accordance with British Standards.

Wall plugs - SWIP IWI wall plugs.

Vapour Control Membrane - Open.

Vapour Control Membrane - Closed.

SWIP Reveal Board - 27mm extruded polystyrene bonded to plasterboard or 12.5mm extruded polystyrene with a cement screed either side.



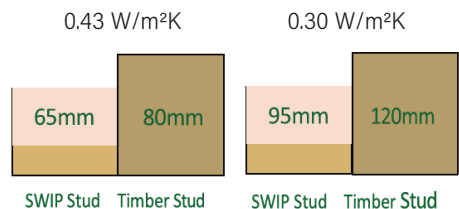
U-values

SWIP 65mm Stud = $0.43 \text{ W/m}^2\text{K}$

SWIP 95mm Stud = $0.30 \text{ W/m}^2\text{K}$

2x SWIP 65mm Studs = $0.24 \text{ W/m}^2\text{K}$

Comparison Between SWIP EcoStud and Timber Stud.





SWIP IWI System Components

1.

Existing solid masonry external wall and existing wet plaster finish
2.

SWIP EcoStuds
3.

SWIP EcoBatt
4.

SWIP Vapour Membrane (Open or Closed)
5.

Tapes (relative to the membrane)
6.

Plasterboard

600mm dimension to centre of adjacent stud

SWIP Stud				
Thickness (mm)	Width (mm)	Length (mm)	Thermal conductivity (W/mK)	Thermal resistance (m2K/W)
65	50	2400	n/a	1.63
95	50	2400	n/a	2.54

Earthwool SWIP Batt				
Thickness (mm)	Width (mm)	Length (mm)	Thermal conductivity (W/mK)	Thermal resistance (m2K/W)
65	555	1200	0.035	1.85
95	555	1200	0.032	2.95

FEATURES AND BENEFITS OF THE SWIP IWI SYSTEM

Features.

- A cost-effective, thermally efficient solution.
- Quick and easy to install with minimal disruption.
- Improved acoustic performance of the existing external wall (Page 7).
- No need to remove the existing wall finish, unless unsound.
- SWIP system can accommodate wall imperfections.
- Can be easily adapted around openings such as windows and doors.
- Can easily accommodate wall fixings for fittings such as radiators, pictures, and shelving.

Benefits.

The use of SWIP EcoStuds eliminates the thermal bridging issue associated with systems incorporating timber and metal studs. The thermal resistance of SWIP EcoStuds provides a high level of thermal resistance, which is comparable to our SWIP EcoBatts. For instance, the SWIP IWI System is almost *13% more thermally efficient* than a timber stud system of the same thickness. Compared to other internal insulation methods, the SWIP IWI System has the following additional benefits:

- SWIP materials are unaffected by moisture.
- Components are lightweight and easy to handle.
- System's U-values for 65mm and 95mm thicknesses compare well against alternative solutions of similar thickness. Plus, greater U-values can be achieved simply by combining thicknesses, one on top of the other.
- The airtight system enables maximum thermal efficiency.
- Incorporates highly sustainable glass mineral wool insulation.

- SWIP EcoBatts share the maximum Euroclass A1 reaction to fire rating to BS EN 13501: Part 1.

Thermal Performance.

A typical 225mm (9 inch) thick uninsulated masonry external wall with dense plaster internally will achieve a U-value of approximately 2.00W/m²K. The same wall insulated with the SWIP IWI 95mm system will achieve a U-value of at least 0.30W/m²K. This is an improvement in thermal performance of over 80%.

If this system was installed in a typical 3 bedroom semi-detached house, it would reduce carbon emissions by approximately 2 tons per year. The tables on Pages 4 and 5 give key thermal performance data for the system.

Double Stud Installation.

Enhanced thermal performance can be achieved by installing double layers of SWIP Studs. For instance, a combination of two 65mm SWIP EcoStuds will achieve a U-value of 0.25W/m²K. After securing SWIP EcoStuds in accordance with the installation instructions on Pages 10 and 11, screw fix a second SWIP EcoStud to the first one. Both EcoStuds should be installed in the vertical position. When fixing the second EcoStud, it is essential that the screws are sufficient to ensure a minimum 38mm penetration into the first SWIP EcoStud. Care should be taken to ensure that the two sets of screws are not installed in coincident positions. SWIP EcoBatt, plasterboard, and SWIP VCL are installed in the same manner as in a single-stud application.

FEATURES AND BENEFITS OF THE SWIP IWI SYSTEM

Sustainability.

The SWIP IWI System incorporates SWIP EcoBatt glass mineral wool insulation, which has the following sustainability credentials:

- It has the maximum A+ generic BRE Green Guide rating.
- The basic raw materials are silica sand (the earth's most common mineral) and recycled glass bottles.
- It can be recycled at the end of the building's life.
- Manufactured using ECOSE® Technology based on rapidly renewable materials instead of petrol-based chemicals. It reduces embodied energy and delivers superior environmental sustainability.

Reducing Air Leakage.

Existing dwellings can suffer from excessive air leakage which, if not treated, can lead to high energy costs, occupant discomfort from draughts and external noise, as well as reduction in indoor air quality. To ensure that upgrading of external walls is as effective as possible, it is important to keep air leakage to an absolute minimum and, preferably, prevent it.

Air leakage can be between the interior and exterior environments, as well as between different elements of the building envelope. Air leakage through the masonry wall occurs through cracks in the bricks; gaps, where there is poor adhesion between the mortar and the masonry units; diffusion through the masonry units themselves.

Where the plaster has been removed and air leakage through the wall is thought to be excessive, it should be tackled before the SWIP IWI System is installed by applying a parge coat to the inner surface of the wall. As the insulation

component of the SWIP IWI System is in intimate contact with the vapour control layer, air movement behind the system should be negligible. However, to prevent unwanted air leakage, all junctions with other elements should be well sealed with particular attention being paid to the joints between the SWIP IWI System and window frames.

The SWIP IWI System incorporates SWIP Vapour Control Layer acting as an air leakage barrier and enabling the system to be integrated with other elements of the building such as ceilings and intermediate floors, which is essential if air leakage levels are to be minimised or negated. Any small gaps or penetration through the dry lining system can be sealed with expanding foam.

Acoustic Performance.

Glass mineral wool is inherently good at absorbing sound and allows sound energy to be dissipated within the body of the insulation. This helps to reduce flanking sound transmission across intermediate floors and provides insulation from external noise sources, especially with the plasterboard lining providing additional mass to the existing construction.

The airborne sound insulation performance of a solid masonry wall, both to and from the exterior, can be improved significantly by installing the SWIP IWI System; a typical improvement of up to 5dB can be expected. However, to maximise the improvement in acoustic performance, it is important that the installed system is as airtight as possible.

OTHER FACTORS TO CONSIDER WHEN INSULATING PROPERTIES

Air Leakage.

Internal wall insulation solutions incorporating rigid foam boards often incorporate a batten airspace either behind or in front of the insulation component, which can lead to air leakage and air movement through the system. Air leakage in or through an internal wall insulation solution can lead to a large amount of unnecessary heat loss and provide discomfort to the occupants of the dwellings due to the presence of cold draughts. *Note: Air leakage should not be confused with ventilation, which is the controlled flow of air into and out of the building and is usually achieved by incorporating ventilators or ventilation systems into the fabric of the building.*

Thermal Mass.

In general, the amount of available thermal mass may not be significantly reduced by the installation of an internal wall insulation system in most house types. Whilst there are no definite rules as to how much thermal mass is required, a general rule of thumb is that the surface area of the walls and floors providing the mass should be at least six times that of the area of glazing in the room. The vast majority of existing houses will have masonry separating and partition walls, which may provide sufficient thermal mass to help stabilise the internal environment. Thus, in a typical mid-terraced property, where the SWIP IWI System is only installed on the glazed elevations, the thermal mass of the dwelling may not be significantly affected.

Avoiding Dampness within the Construction.

The most common causes of damp are moisture penetrating, faulty guttering, condensation, and rising damp. Dampness can have a negative effect on the physical properties of the materials used to construct the wall. Any damp problems must be resolved before installing an internal insulation system in order to protect the building fabric from long-term damage. For instance, missing or damaged render should be reinstated, faulty or missing flashings should be

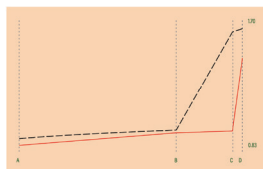
repaired or replaced, and areas suffering from mortar deterioration should be re-pointed with a suitable mortar mix. SWIP EcoStuds should be mechanically fixed to the existing wall using moisture- and corrosion-resistant fixings and wall plugs.

Interstitial Condensation.

Interstitial condensation occurs when warm, moist air from inside a building penetrates the fabric of a structure. When it meets a cold surface, it cools, reducing its ability to carry moisture and increasing the risk of condensation forming within the construction. As can be seen from the condensation analysis graph (Figure 1). Interstitial condensation does not occur within external walls that have been upgraded by the installation of the SWIP IWI System because the actual vapour pressure stays below the saturated vapour pressure through the whole construction. This is due to the presence of the SWIP Vapour Control Layer on the warm side of the insulation, i.e. between the plasterboard and the SWIP EcoBatt insulation.

*Internal conditions: Temperature 18° C, Relative humidity 65%
External conditions: Temperature 5° C, Relative humidity 95%
Figure 1 - Condensation prediction graph of a wall insulated with the SWIP IWI system*

*Saturated vapour pressure — — — — —
Actual vapour pressure —————*



Thermal Bridging.

Thermal bridging refers to areas in a building structure where heat is transferred more quickly than the surrounding areas. This typically occurs due to breaks in the insulation envelope, causing cold spots on the external walls.

OTHER FACTORS TO CONSIDER WHEN INSULATING PROPERTIES

Thermal bridging can cause an increase in heat loss, surface condensation, and mould growth and can be a particular problem in terraced houses.

Areas of Limited Space.

To help reduce thermal bridging, the SWIP 27mm and 12.5mm insulated Reveal Boards can be used in areas of limited space, where the full depth of the SWIP IWI system may not be appropriate. These areas could be window reveals, around fixed services, limited access staircases and lobbies or where door openings are impaired. It is very important that if the SWIP IWI 95mm or 65mm system cannot be installed, these areas are still insulated to prevent condensation and mould growth.

Surface Condensation.

Surface condensation occurs when water vapour comes into contact with a cold surface and condenses (reverts to liquid form). Reducing the amount of water vapour in the air by ventilating kitchens and bathrooms and maintaining sufficient room temperatures will help reduce condensation forming on the internal surfaces. The installation of the SWIP IWI System will raise the surface temperature of the walls to a level, whereby condensation is unlikely to form. As can be seen from Figure 2, the warm surface temperature of the internal walls remains constant across the SWIP EcoStuds, reducing the risk of condensation forming.

Combustion Appliances.

It is imperative that ventilation requirements for gas, oil or coal-fired combustion appliances are

not compromised by the installation of the SWIP IWI System and the system does not interfere with the supply of fresh air to the appliance. Recommendations, guidance, and compliance with the Building Regulations for the ventilation of combustion appliances can be found in Building Regulations Approved Document J - Combustion Appliances and Fuel Storage Systems. If in any doubt regarding the safety of a combustion appliance, consult with a Gas Safe registered engineer.

Flues.

Care must be taken to ensure that flues or ventilation measures for combustion appliances are not blocked or adversely affected by the installation of the SWIP IWI System. Minimum requirements for the surrounding walls of a log burner/flue is 200mm - as long as this can be achieved, the IWI system can be installed around this feature. The heat generated from the fire will reduce the risk of mould and condensation, however, these are our recommendations as a system designer - please check with your funder before proceeding.

Fire Safety & Building Height Limitations.

In accordance with Approved Document B Volume 1, Paragraph 10.7, the SWIP IWI system is subject to height restrictions based on the fire performance of the insulation materials used. Maximum Installation Height: The SWIP IWI system must not be fitted at a height exceeding 11 metres from the external ground level in any domestic dwelling. *Note: To determine the height, measure from the lowest side of the building at ground level up to the top surface of the highest floor.*

Comparison Between SWIP EcoStud and Timber Stud.

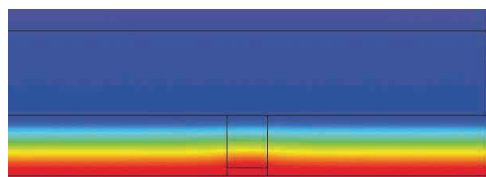
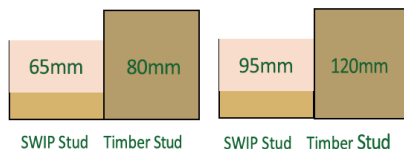


Figure 2 - Thermal contours through the external wall and SWIP IWI system (image generated using HEAT 3 software)

INSTALLATION OF THE SWIP IWI SYSTEM

Prior to the installation of the SWIP IWI System, a comprehensive property survey should be carried out to establish the condition of the building and its suitability to receive the system and to identify any remedial work required. At this point a decision can be made as to whether the SWIP IWI system is appropriate for the property.

Step 1.

- Where plaster is sound, and there are no gaps behind it, the system can be fitted directly to the wall.
- If not sound or when plaster is not fitted directly onto the substrate (e.g., dot and dab), remove the plasterboard and, for greatest airtightness, seal with a parge coat.
- Decorative fixtures such as skirting boards and dado rails should be removed when possible.

Step 2.

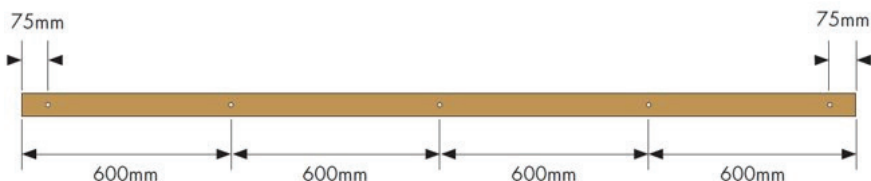
- SWIP Studs are to be installed with the OSB facing into the room.
- Screw fix SWIP EcoStuds horizontally to the foot of and along the top of the existing wall. A minimum fixing penetration of 40mm is required into the existing masonry wall (excluding thickness of plaster).
- Five fixings per SWIP EcoStud are recommended but the number can be increased as required.
- Position the fixings at 600mm maximum

centres and 75mm from the end of each SWIP EcoStud as shown below. These SWIP EcoStuds should be positioned so that, if the wall is bowed or not vertical, the verticality of the SWIP IWI System is maintained.

- The horizontal SWIP Studs should also be located so that the OSB can provide a fixing point for the skirting board if required.

Step 3.

- Screw fix SWIP EcoStuds horizontally at the head of the wall following the same process as in step 2.
- Then, fix SWIP EcoStuds vertically between the top and bottom horizontal SWIP EcoStuds, spacing them at 600mm horizontal centers to coincide with plasterboard dimensions.
- Ensure that the vertical SWIP Studs are cut and installed tightly with the horizontal studs at floor and ceiling level.



INSTALLATION OF THE SWIP IWI SYSTEM

Step 4.

- Friction fit SWIP EcoBatts between the SWIP Studs, ensuring the insulation zone is completely filled.
- There should be no gaps between the SWIP EcoBatts, and they should be installed tightly between the SWIP EcoStuds and the SWIP Vapour Control Layer.
- Where SWIP EcoBatts require cutting, they should be cut 5mm wider than the space they are intended to fill.

Step 5.

- Once the insulation has been installed, staple the Vapour Control Layer to the SWIP EcoStuds.
- SWIP Vapour Control Layer should be free from holes; any gaps should be made good, edges sealed, and overlaps taped effectively.
- Screw 12.5mm standard plasterboard to the SWIP EcoStuds using 38mm drywall screws or wood screws at nominal 300mm horizontal and vertical centers, reducing to 200mm centers at corners.

Ensure that there is a 3-5mm gap between the plasterboard and the existing floor to allow space for sealing.

Step 6.

- Seal all joints at the perimeter of the plasterboard using SWIP Multi-Purpose Sealant to prevent air movement behind or through the SWIP IWI System.

Note: Pullout strength tests have confirmed that SWIP EcoStud performs equally to that of metal or timber studs.

Step 7.

Installing SWIP Vapour Control Layer or Intello Membrane should be installed in accordance with the recommendations of BS 5250: 2021

'Code of practice for control of condensation in buildings' and should be installed on the warm side of the insulation.

- All laps in SWIP Vapour Control Layer and junctions at interfaces with other elements and materials in the building, e.g., metal and timber studs and joists, cementitious boards, and uPVC window frames, should be sealed with the correct SWIP adhesive tape.
- All joints in the SWIP Vapour Control Membrane should be lapped equidistantly by a minimum of 75mm.
- Whenever possible, laps in the SWIP Vapour Control Layer should be coincident with a SWIP EcoStud in order to aid the sealing process.
- The number of laps can be kept to a minimum by installing full roll widths of SWIP Vapour Control Layers.
- Where the heads of fixings penetrate the SWIP Vapour Control Layer, they should be sealed with the correct SWIP adhesive tape, as should any tears, holes or cuts.
- The tape should overlap the damaged area by a minimum of 75mm.
- Where larger areas of damage occur, they should be repaired with a patch of SWIP Vapour Control Layer and the correct tape.



VAPOUR CONTROL LAYERS

SWIP offers 2 types of membrane depending on whether the property is situated in a high-exposure area. On our website, you can find a System Selector, which gives guidance as to which membrane should be used dependent on the property postcode.

SWIP Vapour Control Layer - This is SWIP's standard green closed membrane and should be sealed at all elements with Foil tape.

SWIP Intello Membrane - The SWIP Intello membrane is a high-performance intelligent vapour membrane, which can regulate the diffusion of humidity from the surrounding air all year round, by changing its permeability. This is achieved by the membrane being able to change its molecular structure depending upon the climate, either closing to prevent moisture penetration or opening to allow the structure to dry out in warm conditions. This climate-controlled membrane can eliminate moisture accumulation and prevent mould growth from occurring as well as providing an airtightness barrier. It should be sealed with blue Tescon Vana adhesive tape (for overlaps) and white Contega Solido adhesive tape (to seal edges).

Step 1 - Installing Membrane.

- Roll out the membrane and fasten it using galvanized staples with a width of at least 10mm and a length of 8mm at intervals of 10-15cm.
- Install the membrane to stop approx. 4cm short of adjacent building components so that an airtight bond can be applied here subsequently.

Step 2 - Overlapping the Membrane.

Allow for an overlap of approx. 75mm between the membranes. The marking that is printed onto the membrane will serve as a guide here.

Step 3 - Clean the Subsurface.

Clean the subsurface (dry and free of dust, silicone, and grease) and carry out an adhesion test if necessary.

Step 4 - Sticking the Overlaps.

Centre the adhesive tape on the overlap and gradually stick it in place, ensuring that there are no folds or tension.

Step 5 - Attaching Adhesive.

Rub the adhesive joint firmly into place, ensuring that there is sufficient resistance pressure.

Step 6 - Sealing the Edges.

Put the VCL in place leaving some slack to allow for relative motion between components. Centre the tape and gradually stick it in place. Rub tape firmly into place.



INSULATION AT WINDOW AND DOOR OPENINGS

Wall Openings.

- Around openings (windows, doors, etc.) screw fix SWIP EcoStuds to the wall around the edges to frame the opening.
- After sealing the membrane, line the reveal of the openings with SWIP 12.5mm or 27mm reveal board. The edge of the reveal board should finish flush with the face of the SWIP EcoStuds.
- A full bed of adhesive should be applied to the reveal board in order to prevent air movement behind the board. The reveal board should then be fully bedded into position.
- Secure the thermal laminate with a minimum of 2 localised mechanical fixings per board, typically at 600mm vertical centers or as determined by on-site requirements.
- Complete continuity of insulation should be achieved around the opening at the junctions of heads, jambs, and sills by cutting back the plasterboard at the edge of the thermal laminate board.
- When setting out SWIP Studs adjacent to openings in relation to plasterboard dimensions, make allowance for the fact that the plasterboard needs to extend beyond the centre line of the jamb SWIP EcoStud to cover the thermal laminate board. For example, the dimension between the centre lines of the jamb SWIP EcoStud and the next SWIP EcoStud needs to be 600mm, less the thermal laminate thickness (inc adhesive dabs), less 25mm (half the SWIP EcoStud width).

Installation Method at Skirting Board.

Whenever possible, skirting boards should be removed prior to installation in order to maintain insulation thickness and continuity. However, where this is not possible the following method may be used*.



- Screw fix horizontal SWIP EcoStuds (between vertical SWIP EcoStuds) at the appropriate height in order to provide a fixing point for new skirting board and facilitate securement and sealing of the SWIP Vapour Control Layer.
- The depth of the horizontal SWIP EcoStuds should be reduced accordingly to ensure that they are installed in line with the face of the vertical SWIP EcoStuds.
- Where necessary, reduce the thickness of the SWIP EcoBatts to suit the reduction in depth of the SWIP EcoStuds.
- Fixings should be located 75mm in from each end and one in the centre of the horizontal SWIP EcoStud.
- A minimum fixing penetration of 40mm is required into the existing masonry wall (excluding thickness of skirting board and plaster).

**If reduced thickness of insulation is used due to technical requirements, then skirting, coving, and any other decorative fixtures must be removed.*



ACCOMMODATING FIXTURES AND FITTINGS

Fixing Radiators.

Do not fix radiators to plasterboard alone. Sufficient support is provided only when radiator brackets are fixed:

- Through the plasterboard into the SWIP EcoStuds.
- To horizontal timber battens (fixed over the plasterboard).
- To horizontal timber battens, fixed between the SWIP EcoStuds and to the masonry wall.
- To SWIP Drywall Fixing Channels, screw fix to the SWIP EcoStuds behind the plasterboard to the masonry wall using suitable stand-off fixings.
- Timber battens are suitable for loads up to 75kg per meter run acting parallel to the plasterboard, and should be used for heavier radiators.
- SWIP Drywall Fixing Channels are suitable for loads up to 50kg per meter run acting parallel to the plasterboard and can be used for small radiators.

For heavier items, such as kitchen cupboards, specialist heavy duty cavity anchor fixings should be used or they can be fixed to timber battens, which have been secured to the existing external walls at pre-determined positions.

Heavier items can also be secured by fixing back to the masonry wall using proprietary stand-off fixings or a suitably sized standard screw. Alternatively, screw fixing an 18mm plywood sheet to the face of the SWIP EcoStuds over the entire wall area (after installing the SWIP Vapour Control Layer) to provide a solution to a wide range of fixing problems.

NB: If in any doubt as to the suitability of fixings, consult the fixings manufacturer.

Picture Rails and Dado Rails.

Picture rails and dado rails should be removed before installing the SWIP IWI System as they will prevent the SWIP EcoStuds from being fixed tightly against the wall. However, they can be fixed to the new plasterboard lining using an instant grab adhesive after installation of the SWIP IWI System. Alternatively, the rails can be fixed to the SWIP EcoStuds using suitable screws.

Fixing to Plasterboard.

Light to medium weight items such as mirrors, pictures, shelving, and curtain poles can be fixed in position using standard self-drilling, winged or toggled plasterboard fixings, and fixings such as SWIP Drywall anchors, which are suitable for loads up to 20kg acting parallel to the plasterboard.

ELECTRIC CABLES AND FITTINGS

Electric Cables in Existing Walls.

In a large number of instances the SWIP IWI System will be installed onto existing walls where the electric cables will be buried within the internal finishes. The current carrying capacities for electric cables buried in plaster are contained in Appendix 4 of BS 7671, Requirements for electrical installations - IET Wiring Regulations - 17th edition.

- The most commonly used cable sizes in domestic properties are 2.50mm for 32 amp ring circuits serving socket outlets and 1.00mm or 1.50mm for lighting circuits.
- The current carrying capacity for the 2.50mm cables sunk into plaster are given in BS 7671 as 27 amps for twin and earth cable and 24 amps for wiring in conduit.

The effect of installing a layer of insulation over the inner surface of the wall would reduce the current carrying capacity of the 2.50mm cables to 25 amps and 22 amps for the twin and earth and conduit wiring respectively, and apply when insulation has been installed only on one side of the wall. Where the SWIP IWI System is installed, and there is also existing cavity wall insulation, the cables should not require any additional de-rating due to the high thermal mass of the wall which will in effect negate the risk of the cables reaching elevated temperatures. Regulation 433.1.5 of BS7671 requires cables used for 32 amp ring circuits to have a minimum current carrying capacity of 20 amps. Because the ratings above are greater than 20 amps existing 2.50mm, 32 amp ring circuit cables will continue to meet the requirements of BS 7671 for current carrying capacity after the internal wall insulation system has been installed.

Lighting Circuits.

- Lighting circuits are generally protected by either 6 amp or 10 amp fuses or circuit

breakers. The current carrying capacity of 1.00mm or 1.50mm cables sunk into plaster will remain suitable for lighting circuits when an internal wall insulation system is fitted.

- Larger cable sizes, such as 6.00mm twin and earth, are likely to be used with 45 amp fuses or circuit breakers for heavier loads such as electric cookers or electric showers. The current carrying capacity of a 6.00mm cable sunk into plaster will be such that it will still be suitably protected by a 45 amp device after the installation of an internal wall insulation system.
- From the above, it is concluded that the current carrying capacity of existing ring circuits, lighting circuits, and 6.00mm cable circuits for cookers or electric showers will remain adequate after the installation of an internal wall insulation system.

Note: As with all electrical work, if at all in doubt, consult a suitably competent person such as a qualified electrician.

Electric cables and extruded polystyrene.

PVC insulated cables should be located in suitable conduit to avoid being in direct contact with extruded polystyrene insulation in order to prevent plasticizer migration, which can cause loss of protection to the conductors.

Extending cables for socket outlets and accessories.

When socket outlets on the existing external wall need to be repositioned on the new SWIP EcoStud lining, it is likely that the existing cables will need to be extended. If there is sufficient spare length in the existing cables, then they should be pulled through, so that they can be reconnected to the accessory fitted to the SWIP IWI System.

ELECTRIC CABLES AND FITTINGS

However, if the existing cable has to be extended, BS 7671 requires joints and terminations to be made in suitable enclosures. One solution is for the additional length of cable to be connected into the back-box of the existing accessory, which is then fitted with a blank cover plate.

The additional cable could then be taken through a knock-out panel in the existing back box (with a grommet fitted) and fed through to the new fitting.

The section of cable running from the old socket outlet position to the new position needs to be considered in accordance with BS 7671, and de-rating factors may need to be applied as detailed in Table 52.2 of BS 7671.

The application of a de-rating factor to the cable used in this situation is unlikely to result in the cable rating falling below 20 amps (as detailed in BS 7671), although each case should be judged upon its own merits.

Further requirements for joints and terminations are detailed in BS 7671. BS 7671 also requires (with some exceptions) that 'every connection shall be accessible for inspection testing and maintenance'.

BS 7671, published on 1st July 2011, has added another 'exception' to the list, which applies in this instance. Insulation displacement or insulation piercing connections complying to BS 5733 and marked MF (maintenance free) do not need to be accessible. Electric cables that have been extended can then be run forward in conduit and sealed to the vapour barrier. Extending cables in this manner is not classified as "notified work" (according to Approved Document P, 2006 Design and installation of electrical installations) and can be carried out by a suitably competent person.

All electrical work should be carried out in accordance with Approved Document P, the relevant part of the current IEE Regulations and associated Guidance.

Note: As with all electrical work, if at all in doubt, consult a suitably competent person such as a qualified electrician.

Socket and Switch Boxes.

Socket and switch boxes should be fixed into the plasterboard lining in accordance with the manufacturer's instructions. Plasterboard and drywall socket and switch boxes simply clip into place when inserted into a pre-prepared opening. When the face plate is tightened onto the socket box, the box grips against the plasterboard. Before the face plate is finally fixed, the boxes should be sealed against the plasterboard using SWIP Multi-Purpose Sealant to prevent air leakage. Cables penetrating the socket box should be sealed with SWIP Multi-Purpose Sealant. As with an existing installation, back-boxes fitted into the front plasterboard face of the insulated wall should be of the type intended for plasterboard or dry walls. The SWIP EcoBatt insulation behind the back box should be cut away to the depth of the back-box rather than forcing the back-box in and compressing the SWIP EcoBatt.



ELECTRIC CABLES AND FITTINGS

Surface Mounting of New Cables.

Where new surface-mounted electric cables are installed (horizontally) on the room side of the SWIP IWI System, they should be run in metal conduit to where the fixings/outlets are required, prior to the installation of the vapour control layer.

The SWIP Studs should be notched to suit the dimensions and shape of the metal conduit.

Installation of New Circuits.

The requirements of Part P of the Building Regulations and BS 7671 must be adhered to when installing new ring circuits.

Where a complete new electrical installation or a single new circuit is to be fitted in a house having internal wall insulation installed, the electric cabling should be run behind the plasterboard but in front of the SWIP EcoBatt insulation slabs.

The cable ratings for this situation should be taken as those given for Reference Method A in BS 7671. The rating for a 2.50mm flat twin and earth cable installed in this position is 21 amps (Table 4, D5, Col 4, BS 7671) of 20 amps if in conduit in this position. Thus, with this installation method a 2.50mm cable is suitable for a 32 amp ring circuit. Also 1.00mm or 1.50mm cables are suitable for lighting circuits protected by 6 amp or 10 amp fuses or circuit breakers.

For a circuit supplying a cooker or electric shower which is protected by a 45 amp device a 10.00mm cable would be required. BS 7671 includes specific requirements for cables that are concealed in a wall or partition at a depth of less than 500mm from the surface. Cables installed in an internal wall insulation system fall

into this category. The specific requirements include the use of metal conduit or trunking or other mechanical protection against penetration by nails and the like, the use of armored cables or cables to BS 8436 and running the cables in specific zones.

If the option of running the cables in specific zones is selected, then additional protection by means of a residual current breaker (RCD) is also required. The recommended option is that of running the cables in the zones specified in Regulation 522.6.6 with the installation of an RCD.

Note: As with all electrical work, if at all in doubt, consult a suitably competent person such as a qualified electrician.

TECHNICAL SUPPORT

Technical

Our expert technical team is here to support you at every stage of your project. We offer pre-installation reviews of technical survey photos to help prevent issues before work begins, as well as live video call assistance during installations.

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