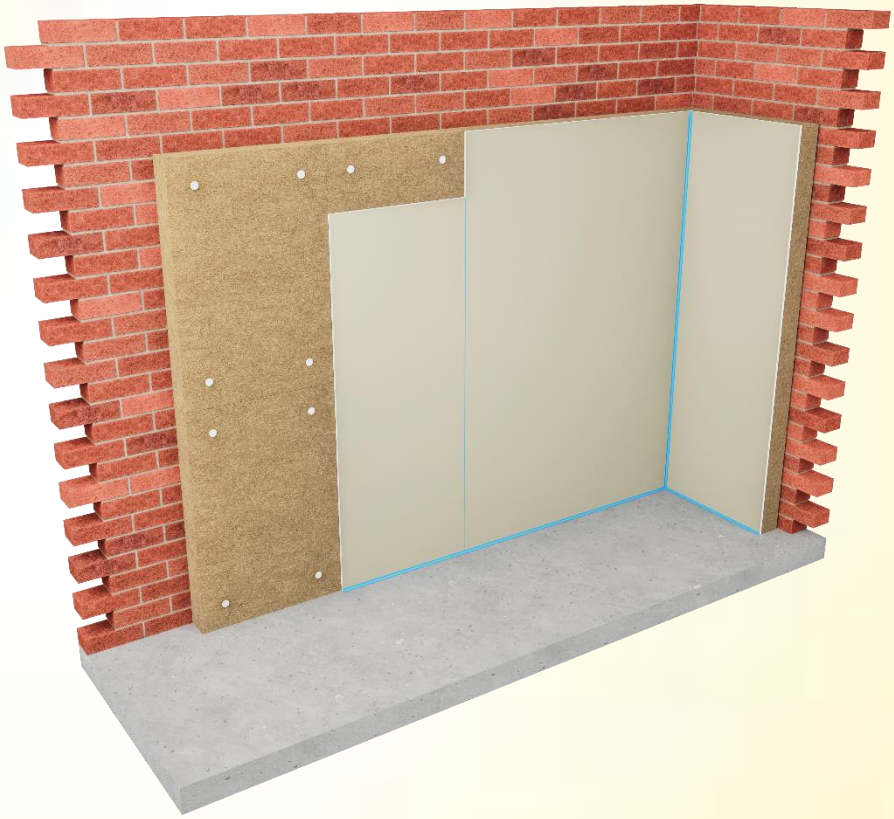
The Ezy Fit M IWI Internal Wall Insulation System Design Guide



Ezy Fit, Commer House, Tadcaster, LS24 9JF

Why Insulate a solid wall?

Did you know that up to 45% of the heat lost within the home could be lost directly through the walls?

The majority of losses are through solid walls rather than walls built with cavities in. Most homes today are built with a cavity wall with insulation between both wall faces however in older properties insulation was not a consideration as the properties were being built.

A home with no or poor wall insulation could save many hundreds of pounds per year off their energy bills with a few simple steps and a basic insulation system. Not only that but the comfort factor of a home would increase massively once a home is correctly insulated.

Correctly insulating a solid wall home can directly lead to

- ✓ Savings from annual energy bills
- ✓ Reduction in exposure to damp
- ✓ Assistance with various health benefits associated with a damp or cold draughty home.
- ✓ Increase in comfort levels
- ✓ Extended life of heating appliances, as they don't have to work as hard with a well-insulated home

How to Insulate a Solid wall Home

There are two main ways to insulate a home that does not have cavity wall's or one that has a cavity wall that cannot be filled with traditional practices. These are homes that have been built with a timber frame that needs to breath to avoid wood used in the construction becoming damp and rotting.:

1-External Wall Insulation.

With this method the entire house is wrapped with an outer casing of Mineral wool or EPS (Polystyrene boards). Once wrapped a mesh and aggregate coat is built up to strengthen the protection of the insulation from the elements. This is a very attractive way of improving the desirability of the home as well as improving comfort levels and warmth for all of the people living in the home.

Costs can vary for the average home based on size and specification of the insulation and coatings used to insulate the property. The typical cost is upwards of £15,000 per home and will usually take a skilled contractor a minimum of one week to complete the work. Often planning permission is required to complete the enhancement to the properties façade and the insulation system cannot be applied in certain weather conditions.

2-Internal Wall Insulation

The M IWI System is an internal wall insulation system, so we will focus on this type of system within the Design Guide.

Internal Wall Insulation is a method of insulating the outer wall of the property from inside of the property. With this method a home will lose around 10cms of an external facing room but gain hundreds of pounds per year in savings made on energy as well as warmth and comfort beyond that previously experienced in an un-insulated home.

How it works

Before an internal wall insulation system can be fitted within a property, an assessment needs to be carried out by a suitably qualified individual who can ascertain if the property is in good enough state of repair to be able to receive the insulation without causing further issues with trapped damp. Should the property be deemed as suitable to receive an internal wall insulation system, the property would receive basic preparation work prior to the installation process commencing.

- The walls to be treated should be sound and in a state of good repair.
- Any wallpaper would need to be removed as this can sometime trap condensation.
- A competent person should have planned the installation of the system.
- If need be, a parge coat of fungicidal wash could be used, however this is not mandatory.
- Should the property be located within a part of the country (often referred to as a high exposure zone) extra care would need to be taken to ensure an interstitial damp report was carried out and that the outer walls of the property were either covered in a sound render, unlikely to be porous, thus eradicating a high risk of damp or brick cream should be bused in extreme circumstances

The above points are true with all internal wall insulation systems.

Ezy Fit M IWI Internal Wall Insulation System -

Once the property is prepared to receive an internal wall insulation system, the insulation would be placed against the inside of the outer walls of the property and then a layer of plasterboard would be added over the top of the insulation. The below photograph depicts the end-to-end journey and the component parts of the system as an example

Picture thanks to Borthwick Group Ltd

To successfully install the Ezy-Fit M IWI system, fixtures such as radiators, pipework and any exposed electrical sockets, switches and high amperage cables will need to be assessed for their suitability of position as the insulation may have an impact on their performance. We always recommend using a suitably qualified person to assess the position of these items before work commences. These are tasks that are standard practice with an Installer of Internal Wall Insulation. This may mean that these services need to be moved or re-routed as part of the work associated with installing internal wall insulation. Always use a suitably qualified individual to assess and then carry out the work.

With the internal wall insulation system, planning permission is rarely required (please check for listed or protected buildings) and likewise work can be completed all year round as all the improvements are carried out on the inside of the house.

*Always read the relevant Agrement certificate that is associated with the IWI system you are fitting

Some of the advantages of using an internal wall insulation are:

- The outer appearance of the home is not impacted, thus protecting the look and feel of a property
- No scaffolding is required to apply internal wall insulation
- It can be installed on a room-by-room basis, so you do not need to “decant” the entire house while work is being carried out
- It is often cheaper to install than external wall insulation*
- It is faster to install than external wall insulation*

It is also worth noting that in some instances a mix of both internal and external wall insulation can be used on a property. This is called a “Hybrid” solution.

*Should the property be suitable to receive an internal wall insulation system and be in a good state of repair. We always recommend a professional survey the property prior to any work of this nature commencing.

DESNZ Best Practice Guidance

We cannot talk about internal Wall Insulation without mentioning the DESNZ Best practice Guidance that was released in 2021 and guides Energy Efficiency Scheme participants in best practices for both installation and avoidance of future issues by suggesting which internal wall insulation systems are preferred and methodologies behind applying those insulation systems. A link to the document can be found below:

Retrofit internal wall insulation: best practice - GOV.UK (www.gov.uk)

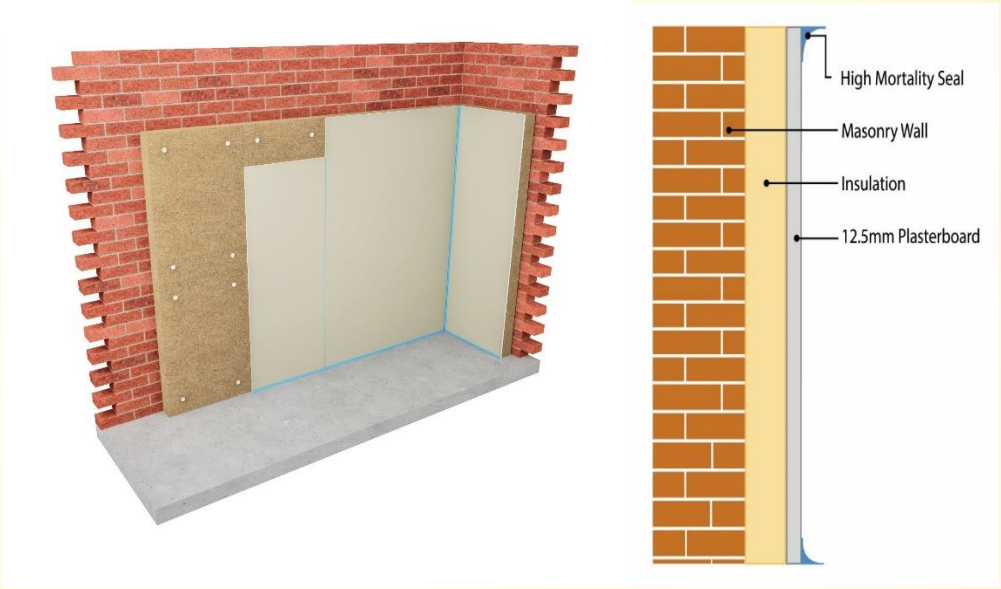
The Ezy Fit M IWI system complies with the System Design side of the DESNZ Best Guidance Practice and as such is suitable to use on any Government backed Energy Efficiency Schemes in place. The Ezy-Fit M IWI system can also attract an Insurance backed guarantee that helps protect the Customer and again is essential in most Government supported schemes.

Please read this system guide along with the M IWI Agrement certificate which can be found on the KIWA website: Kiwa BDA Agrément Search facility

The Ezy Fit M IWI System

The system comprises of:

1. High density mineral wool insulation, which is applied to the interior lining of an external wall and in most cases is 100mm in depth.
2. Fixings that are made specifically for high density mineral wool insulation and recessed within the plasterboard before being covered with a 5mm skim of plaster.
3. Reveal board for windows and confined spaces which will not allow a Mineral wool, insulation slab to be placed.
4. High mortality sealant to seal the joints between plasterboard to ensure air tightness.
5. We would expect the installing contractor to supply their own plasterboard which would be secured with Ezy-Fit fixings.
6. A “finish” plaster of 5mm would be required to complete the installation.



A demonstration of the component parts in situ

Below are the test results for the component parts

Moisture Control		
Test	**Standard**	**M-IWI Slab**
Water vaour transmission	BS EN 12086, Method A	NU1
Water vapour resisitance (m2sPa/kg)	BS EN 13950	
Fire Performance		
Test	**Standard**	**M-IWI Slab**
Reaction to fire classification	BS EN 13501-1	A1
Thermal Performance		
Test	**Standard**	**M-IWI Slab**
Declared aged thermal conductivity (W/mk)	BS EN 12667	0.036

Benefits of using the Ezy Fit M IWI System

- ✓ Cost effective solution
- ✓ Quick and easy to install, usually faster to install than similar IWI systems.
- ✓ Can improve the acoustic qualities of a home meaning a quieter and warmer home.
- ✓ Can make walls look “like new” with a 5mm plastered finish.
- ✓ The system can improve the look of walls that are not quite square and thus imperfect.
- ✓ Easy to adapt around windows and openings
- ✓ Can easily accommodate fixings
- ✓ There is little need to add studs or cut prefabricated studs to length, thus reducing on site waste.
- ✓ No metallic frames thus reducing the risk of thermal bridging and specialist tools
- ✓ Minimal number of component parts required, thus making ordering components easy
- ✓ Waste is reduced through multiple use of the same materials
- ✓ The airtight system enhances performances as per the BEIS Best practice Guidance
- ✓ Mineral wool slabs have an A1 fire rating
- ✓ The system can be used in buildings without a restriction on building height.
- ✓ Easy to ensure no gaps or thermal bridges exist due to the materials robust nature that is easy to cut and fit into any gaps that may be caused through uneven walls.

Always Avoid possible Damp before fitting and ventilate correctly.

When you “wrap” a building you can accidently trap an issue that has gone un-noticed for years. The importance of a good survey and correct ventilation cannot be underestimated. We always recommend using a suitably qualified PAS (Publicly Available Specification) Assessor and Co-ordinator, as they have been trained in ensuring all properties are correctly ventilated when additional insulation is added to a property. We would always recommend carrying out an interstitial damp report on a property to ensure it is suitable to receive an internal wall insulation system. If in doubt, then double check for damp!

Any damp present should be eradicated prior to any work commencing and the property should be given a “clean bill of health” and identified as suitable to receive insulation. With this would also come a ventilation strategy, thus ensuring that adding the insulation will not have any detrimental impact on the property over the coming years. Maintenance is key and with the Ezy-Fit M-IWI system maintenance is straight forward; it cannot be ignored. Please see our “Maintenance” section of this installation guide as well as the maintenance section of the aftercare guide, we issue.

Prior to any work commencing we should also state that the removal of old wall coverings is essential and where possible we also recommend a fungicidal wash is applied to the inner wall however this must be left to dry before insulation is added.

Blocked gutters, rotten or poorly fitted windows can create some of the damp issues, so checking the outside of the property is equally as important as the inside of each wall. Likewise, if you are in a building with poorly maintained render on the outer wall of the building, we always recommend making sure all surfaces are sounds. You do not need to hack any plaster off or re-render walls, but sound render is key to a dry wall. If you live in one of the high exposure zones within the West of the UK then we also recommend checking that your render is sound and if you have no render on the outer surface of your external walls, we recommend using Storm Dry brick cream as that will assist with keeping the outer walls dry.

Thermal bridging occurs when the continuity of the insulation is broken, causing the inner surface of the wall at that point to become much cooler than the surface where the wall is insulated. This can often occur at the junction of a wall and separating floor. Thermal bridging can cause an increase in heat loss, surface condensation and mould growth and can often be a problem in terraced houses. We recommend installing M IWI between the ceiling and floor area of the first floor along the length of the external wall to avoid any further cold bridges. The fixings used for the M-IWI system are “anchored” into the wall using plastic raw plugs and the fixings travel through 100mm of insulation as well as 12.5mm of plasterboard, when consulting with professional organisations we have found that the risk of thermal bridging through the fixings is mitigated and not considered as a risk to create condensation or future damp. It is essential for 100% coverage to take place on the outer walls of all rooms that have this system fitted and voids are fully insulated to avoid the risk of thermal bridging.

Areas of Limited Space. To assist with these areas, you can also use Ezy Fit reveal board which assists in areas where the standard M IWI Slab cannot physically be used. We always recommend using a full M IWI slab in all cases but understand there are limitations to space at times and using a reveal board is far better than no insulation at all. We recommend a full bed of adhesive plus mechanical fixing be used if a reveal board is the only solution due to space issues.

Floor voids and below ground floor insulation. As with all voids that occur between the ceiling and floor we recommend lifting the end floor board and securing M-IWI slabs to the outer wall. These slabs are essential in ensuring that the voids between ceiling and floor is not going to create a cold bridge and thus cause damage to the property as well as breaking the impact of the insulation provided across the rest of the property. For sub

floor voids we recommend that no insulation is added below a damp proof course in a way that could "bridge" any future damp that arises.

Surface condensation – Occurs when water vapour in the air cools and condenses (reverts to liquid form) as it encounters colder surfaces. Reducing the amount of water vapour in the air by extracting moist air from kitchens and bathrooms and increasing the surface temperature will prevent condensation forming on the internal surface of solid external walls. The installation of the Ezy Fit M IWI system will raise the surface temperature of the walls to a level whereby condensation will not form under usual maximum humidity conditions experienced in dwellings.

Combustion appliances – It is imperative that ventilation requirements of gas, oil or coal fired combustion appliances are not compromised by the installation of Ezy Fit M IWI system and that the system does not interfere with the supply of fresh air to the appliance. Recommendations, guidance, and compliance to building regulations for the ventilation of combustion appliances can be found in building regulations and must be adhered to.

High amperage cables – Always consult with a qualified Electrician when dealing with high amperage cables that may be impacted by the addition of insulation to an outer wall. Insulation added to the outer cover of an electricity cable can reduce its performance so we would always recommend using professionals to either move a high amperage cable or confirm its suitability to be "wrapped" by the insulation.

Water and Gas pipes – As with the electricity running within the house you may also have services such as gas and water that need to be considered before adding insulation. We always recommend using the professional services of a suitably qualified engineer to ascertain what is required in dealing with these service pipes.

If in doubt always utilise the services of a Competent and suitably qualified person when dealing with gas, water, and electricity.

Flues – Care must always be taken to ensure that flues and ventilation measures for all appliances are not blocked or in any way compromised. The makeup of Ezy Fit M IWI Wall slab means they can be placed next to the outer side of a flue but should never compromise its operation. Always check with the manufacturer if in doubt.

Damp Proof Couse (DPC) – The Ezy Fit M IWI System should always be installed above a working damp proof course. In no way should the M IWI wall slab compromise or bridge a DPC as this will lead to greater problems at a later date. We always recommend an injection DPC if no DPC is in place or if the DPC is compromised and cannot be rectified with standard building methods. If IWI is to extend below external ground level then follow guidance in BS 8102:2009 Code of practice for protection of below ground structures against water from the ground

Party Walls – Thermal Junctions can occur when insulation is not continuous. A party or adjoining wall is an area that can create a thermal junction. Whilst returning the insulation on a party wall can mitigate the thermal bridging, care must be taken if insulating along a cold party wall which could in theory make the wall colder and increase the risk of cold or damp that is already there if the neighbour's property is not heated or correctly ventilated.

Always speak to your Retrofit designer for advice on thermal bridging that is unique to the property being insulated. Whilst the Ezy-Fit M-IWI system can advise on generic information each building needs to be separately assessed and evaluated for best possible solutions.

Acoustic qualities of the Ezy Fit M IWI system. The M IWI slabs fitted to a wall improve the comfort of a wall by reducing noise however when using reveal board there is the potential of reducing the original acoustic

qualities of a wall through vibration. In instances where acoustic performance is reduced, we would recommend a mineral wool thermal laminate board be used. Ask Ezy Fit and we will be able to supply these readily.

We cannot stress enough the importance of the property being:

- Professionally surveyed, both inside and outside and deemed suitable for the internal wall insulation to be fitted. If not, please do not fit the system until a professional deems that any repairs have been carried out and potential damp is fully removed prior to work commencing.
- That all services are treated with the respect they demand and professionally assessed to ensure they can complement the building whilst these services are in their current position and if deemed unsuitable, the services may need to be moved prior to work commencing.
- That a professionally created ventilation strategy is in place
- That the homeowner is aware of the ongoing maintenance required to ensure the Internal wall insulation system performs as it was designed to.
- A condensation risk analysis shall be completed at the project-specific design stage for all elements of the construction, including at junctions, openings and
- penetrations, to minimise the risk of surface and interstitial condensation. When correctly installed on an occupied building, no condensation will form on the internal wall.
- For Very Severe Exposure Zones (Zone 4) in accordance with BRE Report 262, the Specifier shall integrate the ventilation strategy for the building into the design and consider wind-driven rain and permeability of existing materials by modelling, using WUFI Analysis.

Installing the Ezy Fit M IWI system

- **Step 1** (Preparation) – Ensure that the wall the insulation is free from wallpaper, any signs of condensation and any indications that damp may be present. If there is wallpaper present, please make sure it is removed before adding insulation to a wall. Try to avoid using steam to remove wallpaper as that can add condensation to a room, if steam is required to remove the wallpaper, then please leave for one to two days before applying insulation to ensure the insulation does not trap any condensation. If there is a painted wall, again try to scratch the surface of the wall which again allows the insulation to be placed against the original plaster rather than a coat of paint at all points. 100% coverage of all outer walls must be ensured, thus avoiding any risk of cold bridging. No parge coat is required on any wall prior to the installation of the Ezy-Fit M IWI system however the wall must be dry and free from any damp or risk of damp.

- Plan the installation of all slabs of insulation so that you are avoiding any risk of drilling through embedded electricity cables or pipes. Ensure surface mounted services have been checked by a suitably competent person to ensure adding the insulation will not compromise safety and their performance. If required, reroute electrical services to on top of the insulation should this be requested by a suitably qualified individual. Always ensure services are safe to work near or around before any work commences.

- Remove all curtains, radiators, Coving, where possible, picture rails and electrical outlet fronts, ensuring that these are removed by a professional who can disconnect services from them first and make it safe to work in that area.

- At this point should the work area be thoroughly prepared you can focus on adding the insulation to the walls. This preparation would also include the marking position of any pattress boxes on the M IWI Slab and drill to allow any electrical cabling to be brought forward – Using a qualified individual.
- Care shall be taken in the overall design and construction of junctions with other elements and openings to ensure a 100% coverage of outer walls is maintained with the installation of the system.
- **Step 2** -Fix the 100mm M IWI slab to the wall using 130mm M IWI plastic fixings. One to each corner of each slab section at a maximum of 100mm from each edge, ensuring any cabling that is being brought forward has been allowed for via a pre-drilled hole. Ensure the insulation is above a working damp proof course. Should you be required to insulate below ground level please speak to a qualified individual who can help with the design of this space.
- **Step 3** – Create a recess in the M IWI Slab allowing any pattress boxes to be fixed into place, ensuring a minimum of 20mm of insulation remain behind the outer surface of the electrical outlet. Usually, an electrical outlet box will be up to 30mm in depth, thus allowing for 70mm of mineral wool insulation to still be behind each outlet, thus removing any risk of cold bridging through temperature change on the wall. Our Agrement certificate states to leave at least 20mm however electrical pattresses are rarely deeper than 30mm. Then Install window reveal boards as required.
- **Step 4** – Ensure coverage is at 100% of the outer walls and each floor or ceiling void is correctly insulated to 100% of the outer walls to remove any risk of cold bridging. The Ezy-Fit M IWI Slab is easy to cut with a saw and can be trimmed around uneven corners and upright elements of the wall. There should be no need to leave any gaps due to the flexibility the mineral wool shows.
- **Step 5** - Fit a 12.5mm plasterboard (BS EN 520) to entire face of M IWI slab using M IWI Plasterboard fixings (minimum 150mm), directly through the M IWI Slab and into the substrate. The fixings have a plastic raw plug sleeve, and the length of each fixing mitigates spot cold bridging, in a similar way to wall ties in a cavity wall are mitigated, over 100mm of insulation material wraps itself around each steel fixing before the fixing reaches a 12.5mm plasterboard and 5mm of finish plaster. The screw should be recessed into the plasterboard and then covered with high mortality sealant prior to a 5mm skim of plaster being added to the board. It is key to say that pressing the plasterboard onto the MI Slab will compress the insulation whilst the fixings are placed into the wall however the material is dense and thus anything other than negligible compression cannot occur for periods exceeding a few seconds. Should compression of the high-density mineral wool be attempted the fixing screws would pull through the plasterboard in seconds, this is not recommended.
- Over 85% of each screw will be impacted by the thermal surrounding of the insulation and plasterboard with the 15% of each screw that is anchored within the wall in a plastic sleeve thus making the risk of any “spot” cold bridging negligible.
- **Step 6** – Seal all planes, edges, and joints of plasterboard using M IWI sealant (polyacrylate-base adhesive sealant for plasterboard which is blue in colour) this is high mortality sealant, to prevent air leakage.
- **Step 7** – A minimum of 5mm plaster coating should then be applied to the plasterboard to increase air tightness.
- **Step 8** - check all trunked air vents to verify they are clear and unobstructed; apply mastic sealant around windows, door frames, etc.

Fixing Radiators – All fixtures can be re-fitted to the masonry wall with the appropriate length screw through the M IWI Slab.

Picture rails and Dado Rails- These can be fixed back onto the plastered finish with either silicon or Grab adhesive.

Coving – Where physically possible this should be removed prior to installation taking place. The image in this document shows coving in place but this would only be applicable if building regulations dictate that it cannot be removed (I.E Listed building)

Pictures and light weight fixings – Can be fitted using the relevant plasterboard fixing.

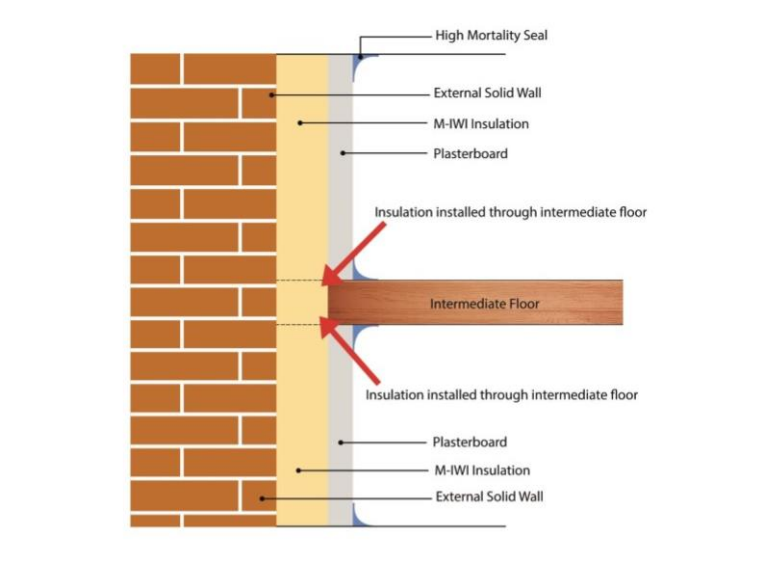
Electrical Cables – These are usually within the wall however these can be pulled through the M IWI Slab to surface mount the sockets. Cables with a high amp rating such as cookers, electric car chargers and showers need to be routed by a fully trained and competent Electrician.

If there are high amperage cables that are surfaced mounted, we recommend consultation with a qualified Electrician who can advise of any requirements to have those cables moved to the outside of the insulation.

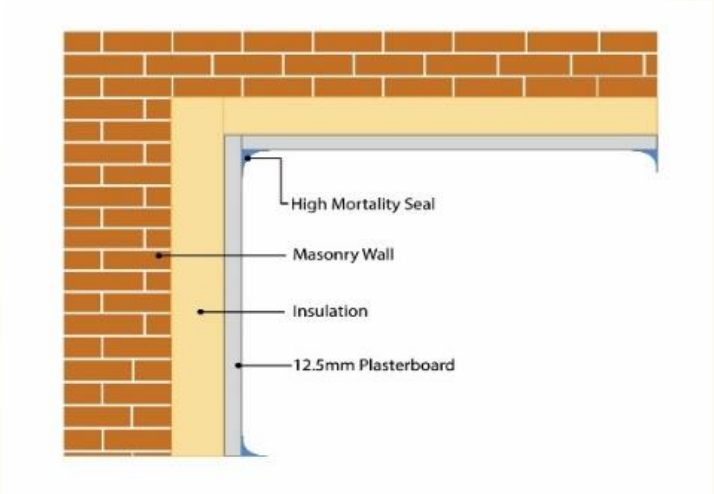
Suspended Timber Floors - Where possible, the area below the suspended timber floor on the first floor or second floors only would be insulated using the Ezy-Fit M IWI system. Fixings would be used as described earlier in this document, and adjacent to the external solid wall should be insulated to mitigate any cold bridging that could occur in an unisulated area.

By insulating this area with our M IWI slab, installed by cutting our M IWI slab to fully fill the gap between the joists and affixed to the external solid wall, the M IWI system deals with the cold bridging issue that other systems striggle to address due to wooden battens being required or metal frames being needed in this restricted area.

When insulating ground floors, care should be taken as to not insulate below or bridge a working Damp Proof Course without reading guidance in BS 8102:2009 Code of practice for protection of below ground structures against water from the ground . The DESNZ Best Practice Guide for the Retrofit of Internal Wall Insualtion should always be adhered to when installing the M IWI System.



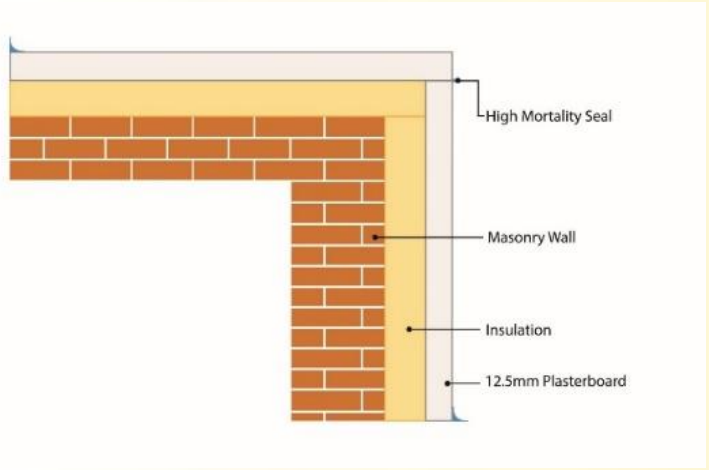
Standard Details – When encountering internal corners, external corners, or even wall details such as coving, the Ezy Fit M IWI system is adaptable and can be installed just as fast and easy.



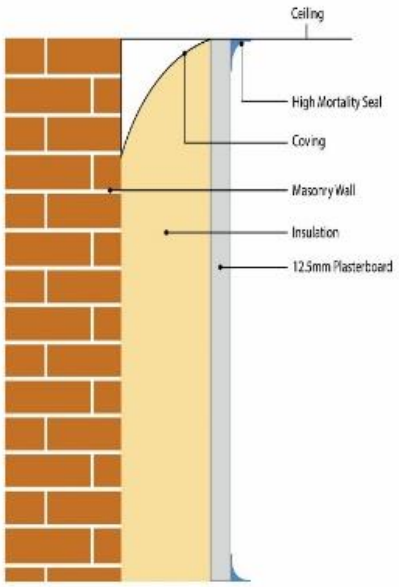
Internal corners should have insulation butted up against each slab to avoid any gaps being created and thus cold bridges being created. In the picture below you can see 100% of the corner has been insulated and plasterboard added that is supported by the insulation on both walls

For **external corners** in a room, the same principles would be in place as for internal corners. The insulation must cover 100% of both faces of each wall. In this case a steel edging strip has been added for plastering purposes, as you would add when plastering an external corner. External corners are robust as with any room that has been replastered, the key is to ensure 100% of the wall on each side has been insulated fully. As the insulation is A1 fire rated, chimneys can be treated this way. **We recommend using a steel edging (trim) for the plasterboard during the plastering stage,** but this is not mandatory and is not part of the insulation system**.**

Below is a photograph demonstrating an external corner, in this case an “edge” has been used to show the insulation that is behind the plasterboard and plaster skim. The insulation would usually reach the ceiling however this image is for demonstration purposes only.



Walls & Ceilings are more straight forward but the installer must ensure the space above a ceiling and below the floor above has sufficient insulation added to avoid any potential cold bridging. If access is not available from above them we recommend accessing this area from below as a skim of plaster will be used across the wall and this, along with plasterboard can “make good” aby area accessed from the ceiling. **Where coving is already in place we recommend removing existing coving where possible to ensure a full depth of insulation can be applied to the wall.** The impact of leaving existing coving in place is negligible however any steps you can take to remove existing coving is recommended.



Maintenance and repair

Once installed, the System requires simple maintenance. For 60-year durability, a bespoke extended repair and maintenance protocol will apply. For advice in respect of repair and maintenance, consult the Agrément holder.

The maintenance schedule for the installed System can be carried out by the person living in the home as no specialist tools are required.

- signs of damaged areas and cracks in the plaster, if spotted please use household filler to repair them. If the sealant around windows is perishing, please replace as you would today.
- signs of damp, discoloration, or black mould should always be reported to the Company that fitted your IWI System.
- Don't forget to always check for signs of deterioration and cracks in the pointing mortar or render of the external wall of your home.

If in doubt the person living in the home should contact the Installer of the Ezy-Fit M IWI system.

Please leave the Customer a copy of the Maintenance requirements via the Ezy-Fit aftercare guide.

For further information please contact us on the details below

Ezy Fit
Commer House
Tadcaster
LS24 9JF

sales@ezy-fit.co.uk

www.ezy-fit.co.uk

www.ezy-fit.co.uk