



Kooltherm® K118 Insulated Plasterboard

INSTALLATION GUIDE



Contents

	Page
Introduction	3
Storage and Handling	4
Materials and Components	5
Pre-installation Considerations	7
Building Condition	7
Design Considerations	8
Preparation of the Substrate	9
Choosing which <i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard Solution to Adopt	10
Installation of <i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard Solutions	11
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Knauf Plasterboard Adhesive Dabs	11
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Alternative Adhesives	14
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Acrylic Sealant Adhesive Blobs or Low Expanding PU Foam Adhesive Beads	15
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Metal Wall Liner Systems	17
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Pre-treated Timber Battens	17
<i>Kingspan Kooltherm</i> ® K118 Insulated Plasterboard with Metal or Timber Framework	18
Fixtures and Fittings Installation Details	21
Ceramic Wall Tiles	23
Light – Heavy Wall Mounted Fittings	23
Thermal Performance and Airtightness	33
Cavity Barriers	38
Movement / Control Joints	38
Dealing with Services	40
Pipework	45
Electrical Services	49

The details contained in this document illustrate good practice for the design and construction of interfaces only in respect to ensuring thermal performance and air barrier continuity. Kingspan Insulation Ltd reserves the right to amend product specifications and thicknesses without prior notice. The information, technical details and fixing instructions included in this document are given in good faith and apply to uses described. Recommendations for use should be verified for suitability and compliance with actual requirements, specifications and any applicable laws and regulations.

Introduction

Kingspan Kooltherm® K118 Insulated Plasterboard is a premium performance, lower lambda internal wall insulation, with a fibre-free rigid thermoset phenolic core. It has a 12.5 mm plasterboard bonded to its front surface and a composite foil based facing on its reverse surface. *Kingspan Kooltherm® K118 Insulated Plasterboard* offers the benefit of insulation, vapour control and dry-lining (plasterboard) finish – three solutions in one system.

It is suitable for mechanically fixed or plaster dab / adhesive bonded dry-lining. This document will equip you with the skills and understanding needed to correctly install the *Kingspan Kooltherm® K118 Insulated Plasterboard*.

The Kingspan details included within this document are available upon request from the Kingspan Technical department in pdf or .dwg format (see rear cover for contact information). They can also be downloaded from our website (see rear cover for details).

Introduction

Storage and Handling

Care should be taken in offloading, distributing and storing all materials.

Handling

- *Kingspan Kooltherm*® K118 Insulated Plasterboard is delivered shrink-wrapped in polythene on pallets and edge protected all the way around.
- The manufacturing code is printed onto the surface of each board. In addition, each pack carries a label with the product description and characteristics, manufacturer's name and the BBA identification mark incorporating the *Kingspan Kooltherm*® K118 Insulated Plasterboard BBA certificate number.
- Insulated dry-lining, like other plasterboard can be difficult to grip and unwieldy, especially in restricted spaces such as stairwells. The boards can be handled in the following ways:
 - a small crane or hoist to lift the boards into the building;
 - a panel trolley to transport the boards to the point of use; and
 - a simple foot-operated 'board lifter' to raise the boards ready for fixing.



Lifting

A full risk assessment and method statement must be carried out prior to any mechanical lifting of materials.

Storage

- *Kingspan Kooltherm*® K118 Insulated Plasterboard should be protected from rain, snow and prolonged exposure to sunlight. The polythene packaging of Kingspan Insulation products, which is recyclable, should not be considered as adequate for outdoor protection.
- Ideally, boards should be stored securely inside a building in temperature controlled conditions.
- If inside storage is unavailable, the boards should be stacked flat on a level base, clear of the ground, and completely protected from inclement weather by use of an opaque polythene sheet or weatherproof tarpaulin.
- Bonding compounds should be stacked on pallets, above ground, clear of surface water and splash back, with overall rain and snow protection.
- The integrity of packaging of all materials and ancillary components should be maintained at all times and all materials should be stored in a logical order as good site practice.
- The insulation component of *Kingspan Kooltherm*® K118 Insulated Plasterboard is chemically inert and safe to use. A Product Safety Data Sheet for *Kingspan Kooltherm*® K118 Insulated Plasterboard is available from the Kingspan Insulation website. www.kingspaninsulation.co.uk



Handling

- ***Boards that have been allowed to get wet should not be used.***
- ***The installer company should provide its own risk assessment for the handling, distribution and use of and disposal of the products and resultant packaging.***
- ***The boards must not be exposed to a naked flame or other ignition sources.***

Materials and Components

Kingspan **Kooliherm**® K118 Insulated Plasterboard is suitable for adhesively bonded dry-lining systems. The materials and components needed to complete the system are as follows:

- fungicidal wash treatment;
- low expanding PU Foam and Flexible Sealant (for sealing perimeter and gaps);
- bonding agent;
- gypsum based Plasterboard Adhesive, Acrylic Sealant Adhesive or Low Expanding PU Foam Adhesive; and
- appropriate secondary fixings such as nailable plugs or equivalent.

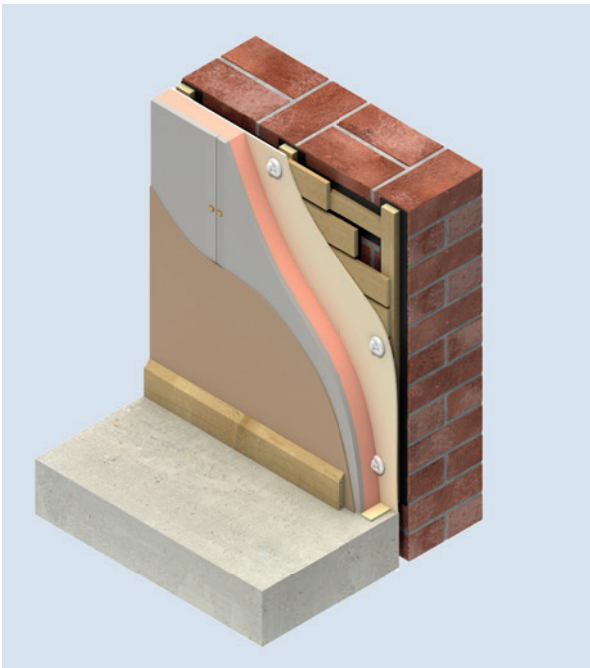


Figure 1: Kingspan **Kooliherm**® K118 Insulated Plasterboard installed with Plaster and Lath on Timber Framework

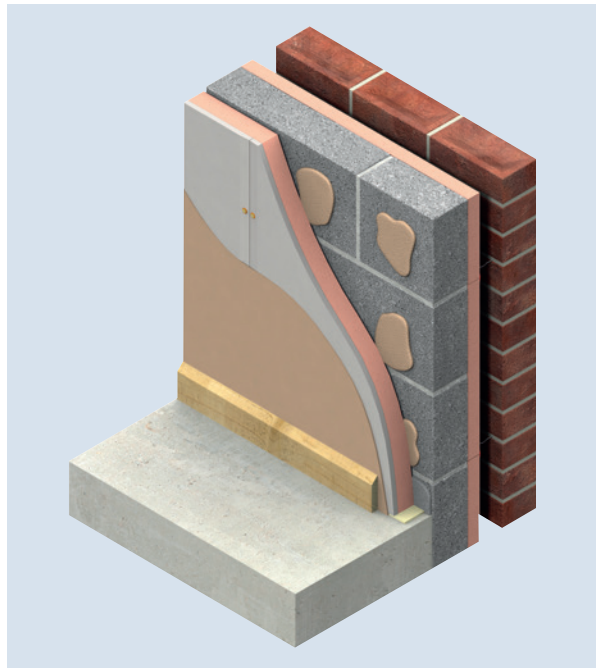


Figure 2: Kingspan **Kooliherm**® K118 Insulated Plasterboard installed with Drywall Adhesive Bonding

Introduction

Kingspan Kooltherm® K118 Insulated Plasterboard is also suitable for mechanically fixed dry-lining systems. The materials and components needed to complete the system are as follows:

- fungicidal wash treatment;
- low expanding PU Foam and / or Flexible Sealant (for sealing perimeter and gaps);
- pre-treated dried softwood timber battens or metal wall liner framework;
- drywall screws or plasterboard nails;
- all-in-one hammer fixings / universal wall plugs and wood screws or equivalent appropriate fixings; and
- damp proof course (DPC) (for use behind timber battens only).

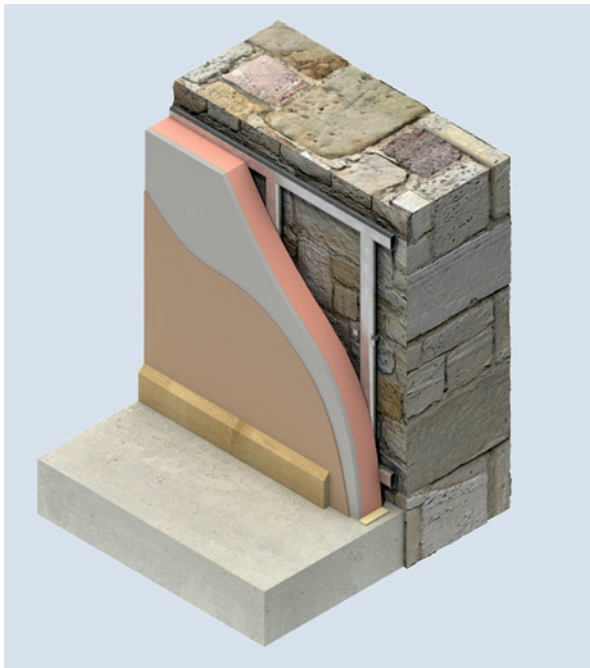


Figure 3: *Kingspan Kooltherm® K118 Insulated Plasterboard* installed with Mechanically Fixed Metal Framing System

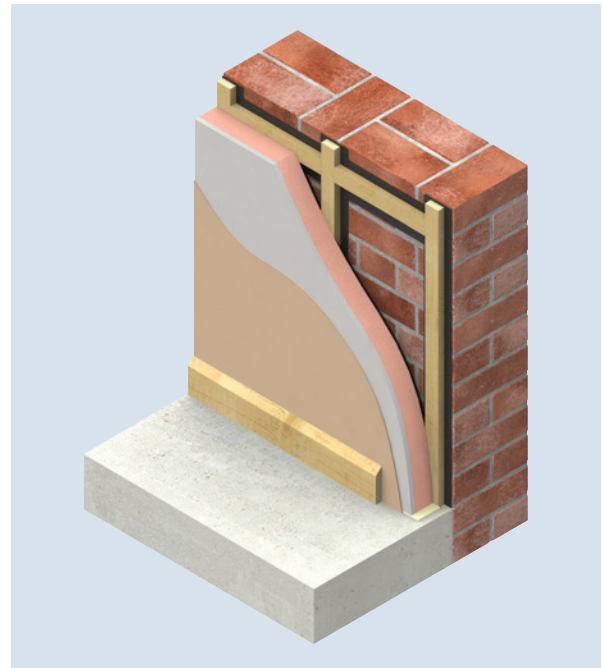


Figure 4: *Kingspan Kooltherm® K118 Insulated Plasterboard* installed with Mechanically Fixed Timber Framing System

Additional materials and components that may be needed to complement both systems are as follows:

- corner bead or corner tape;
- expansion / control joints;
- jointing tape, jointing / bedding compound;
- finishing plaster and scrim tape;
- dual purpose primers (dry-wall primer or dry-wall sealer). When no skim is being applied these primers equalise suction and provide an even texture when dry-lining to receive decoration. If used in two applications it provides additional resistance to moisture vapour movement;
- proprietary shims; and
- coving and cornices, plaster mouldings, skirting boards, architraves, dado rails, window boards, tiling etc.

Pre-Installation Considerations

Building Condition

A detailed survey of the property internally and externally must be carried out before design, preparation and installation can take place.

Ensuring a building is surveyed and diagnosed properly from the outset can lead to a successful specification and ultimately a successful outcome.

When undertaking a building condition survey (building pathology), particular attention should be given to the following as a minimum:

- a survey of the walls, floors, roofs to understand the existing materials, properties and characteristics;
- identifying any standard and non-standard obstacles which will require specific detailing to overcome thermal bridging and air leakage. This can include issues with frontage, position of meters and distribution boards, service cables, pipes or ducts;
- suitability of sill overhangs, roof eaves and verge overhangs;
- identifying cracked / damaged render, the type of existing render that requires repairing / complete removal or reintroducing if required;
- pointing quality and continuity of mortar for each wall;
- rainwater goods and drainage to identify if repairs are needed (ensure no leakages or water accumulation on the walls);
- DPC type. If one doesn't exist, determine if one is required. Advice should be sought from a Building Pathologist;
- ground levels in relation to internal floor levels. These should be assessed in order to ensure an existing DPC is not bridged by the external ground level and that moisture cannot penetrate the walls above floor level;
- identifying any signs of damp or mould growth to walls, ceilings, junctions or interfaces. If any are identified, the cause(s) should be investigated in order to determine appropriate remedial measures;
- identifying if rising damp (or penetrating damp) exists or poses a risk in the future;
- assess exposure zone of the property and construction as it may be pertinent to consider extra protection for some solid wall constructions such as; extended eaves and sill overhangs, applying a masonry protection cream, cladding or render. Such measures could reduce the amount of wind driven rain where the solid wall structure is too thin;
- mould and / or surface condensation may have been caused by a lack of heating, insulation and ventilation;
- mould / penetrating damp which may be a result of leaking external pipework and blocked gutters. Often the main cause for damp patches appearing internally is not because of the original construction or thickness, but because of a fault or degraded material over time;
- ensure there is an adequate ventilation provision for the wet rooms, kitchens and utility rooms; some heating systems require permanently open air vents;
- adding internal wall insulation to an existing building can improve airtightness dramatically, therefore it is very important to ensure the building is adequately ventilated via controlled routes;
- where airbricks are present, for example to aid the combustion of a heating system, consider if ventilation via controlled routes is still required. Over time the heating system may have changed in which case ventilation may no longer be required. If they are still required, this will need taking into account in the design stage to ensure ad hoc solutions are avoided when installation takes place; and
- a detailed inspection of existing timbers, i.e. the timber floor joists, for dry or wet rot and insect attack. Existing metal studs or joists should be inspected for corrosion; decayed timbers or corroded metal should be replaced.

Once risks and defects have been diagnosed, a programme of works should be drawn up to repair the property. It should be dry, stable and in a good state of repair ready to receive the new measure(s).

Consider any other parts of the building (floors, roofs, ventilation) that could potentially receive future upgrades and how that may affect the design or installation. It is also important to consider interaction between measures so that the design adequately considers the air barrier and thermal continuity.

Pre-Installation Considerations

Design Considerations

A design should be prepared as part of a whole house energy efficiency approach where the introduction of internal wall insulation does not negate the correct application of other improvement measures in due course.

The installation guidance and considerations included in this document can be used to assist in determining the suitability of a particular approach for a particular project, but does not itself constitute a design.

A design should consider the constraints of a particular property and also compliance with applicable regulations and standards. Considerations should include, but are not limited to:

- compliance with the relevant Building Regulations requirements;
- any applicable building standards;
- constraints imposed by the local planning authority (including requirements for planning permission, Listing as of Special Architectural or Historic Interest, Conservation Area constraints, Tree Preservation orders, etc.) or any other relevant standards or guidance (e.g. PAS 2030 where applicable);
- constraints imposed by the site, e.g. elevation and exposure (to sun, wind and rain), access, party walls, rights of light and consideration of adjoining properties etc.;
- building heritage, architectural features, structure, construction and condition;
- any existing structural defects, leaks or damp;
- any other energy efficiency measures already installed or proposed;
- the occupants, and any special considerations relevant to them, such as with vulnerable persons e.g. children and elderly people or those with disabilities;
- construction details at all corners, junctions, and edges of installed measures, and all interfaces between measures;
- improving the air-tightness of the building envelope, i.e. reduction of wind-driven infiltration and air leakage;
- provision of deliberate ventilation sufficient to ensure adequate internal air quality and minimise internal surface condensation risk, (especially where the air-tightness of the building envelope will be improved by the installation of insulation), draught stripping, new windows or any other measure;
- management of moisture within the construction, such that moisture will not become trapped within any construction leading to risk of interstitial condensation and consequent damp and deterioration;
- resilience against rainwater ingress (including ingress due to failure of any critical element or construction detail);
- provision of combustion air supplies for any open flued combustion appliances located within the dwelling;
- mitigation of the risk of summer overheating;
- maintenance requirements to ensure the long-term integrity of the installation;
- protection of the building against the impact of fire occasioned by the installation; and
- resilience to flood risk.

Preparation of the Substrate

All insulated dry-lining / internal wall insulation systems require careful planning, selection and setting out before installation can commence.



Before you start

New internal wall insulation linings must be designed to accommodate the thickness of the dry-lining, particularly at reveals, heads, sills, a section of separating or internal walls, all in relation to ceiling height.

Where the dimensions of fixtures are critical e.g. bathrooms and kitchens, these should be double checked before installation of the system.

As a minimum, particular attention should be given to the following:

- new windows and doors (if required), ensuring joinery and position for all services are precisely determined before the chosen wall lining solution is to commence, ascertain any necessary action to be taken prior to fitting the insulated dry lining system, including window and door reveals;
- some post installation works e.g. secondary fix, may be necessary after completing the new wall lining in order to reinstate services, fixtures and fittings. Provisions should be made for their installation after the new wall lining has been installed;
- ensure services (gas, water, electric, telephone and broadband) are checked, removed, extended, replaced or relocated by suitably qualified people;
- the existing structure should be surveyed to ensure the construction is capable of supporting the weight of the internal wall system, ancillary items and any post-installation fittings;
- existing wallpaper, skirting, picture rails, gloss paint and projecting window boards may need to be removed (solution dependant. The amount of preparation and removal required will be dependent on the chosen internal wall system. Some internal finishes such as vinyl, wallpaper or gloss paint, can be scored or sanded as an alternative method to complete removal.
- best practice is to always remove wallpaper, gloss paints, skirting's, etc., regardless of the solution, in order to remove the food source for mould and to remove unforeseen obstacles when it comes to installation. Where this is not practical, good practice would be to use a metal wall lining system;
- in all instances, it is recommended that mould / fungal growth should be removed and the wall treated with a fungal wash prior to installation;
- ceiling linings and floors should be in position before the wall lining starts. Gaps at the perimeter (such as floors and ceilings) or junctions (such as internal corners), or around openings or service penetrations should be prevented;
- if identified, existing gaps should be sealed before the wall lining commences using a flexible sealant or drywall adhesive;
- insulated dry-lining should always commence from a window / door reveal or internal angle, regardless of the chosen method;
- services which will inevitably penetrate the insulated dry lining are to be kept to a minimum to limit damage to the insulation layer and vapour control. Ensure that all services penetrate the wall are adequately sealed;
- before fixing the system, sufficient time must be allowed for damp-proofing treatments to dry out (if applied), (see also, BS 6576 : 2005 (Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses) for dry lining in conjunction with a chemical DPC application); and
- **Kingspan Kooltherm® K118 Insulated Plasterboard** must not be installed to frozen substrates, frost bound surfaces, or when the materials are or have been affected by frost or become frozen.

Pre-Installation Considerations

Choosing which *Kingspan Kooltherm® K118* Insulated Plasterboard Solution to Adopt

The below sets out Kingspan Insulation's general recommendations on which method of attachment to use.

All walls and finishes should be dry, stable and capable of taking the weight of the new wall lining solution.

	Existing Construction – Choosing which Solution to Adopt									
	Fair-faced solid brick > 215mm	Rendered (or equivalent) solid brick > 102.5 mm	Brick, cavity, fair-faced blockwork	Brick, cavity, blockwork, lined internally	Fair-faced solid stonework	Rendered no fines concrete, fair-faced	Rendered no fines concrete, lined internally	Brick, cavity, timber frame, lined internally	Sandstone, timber battens, lined internally	Substrates with services ≥ 25 mm
<i>Kingspan Kooltherm® K118</i> Insulated Plasterboard on dabs (Knauf plasterboard adhesive)	X	✓	✓	X	X	X	X	X	X	X
<i>Kingspan Kooltherm® K118</i> Insulated Plasterboard on acrylic sealant adhesive or low expansion PU foam adhesive	X	✓	✓	✓	X	X	✓	✓	✓	X
<i>Kingspan Kooltherm® K118</i> Insulated Plasterboard on metal wall liner framework	✓	✓	✓	X	✓	✓	X	X	X	✓
<i>Kingspan Kooltherm® K118</i> Insulated Plasterboard on pre-treated timber battens (DPC strips behind timbers)	✓	✓	✓	X	X	✓	✓	✓	✓	X

NB Lined internally = dry, stable plaster, plasterboard on dabs / framework or plaster and lath on timber framework.

KEY:

- ✓ Achievable provided the substrate is within the flatness tolerance (≤ 15 mm from high point to room corners) and services on the substrate are ≤ 25 mm in dept. Partial chasing maybe required or surface mounted onto the new wall lining surface.
- ✓ Recommended solution.
- ✓ Achievable provided the substrate is within the flatness tolerance (≤ 5 over 2000 mm) and services are either: surface mounted onto the new wall lining surface; or fully chased into the substrate; or already exist within a framework; or relocated onto a structure not receiving the new insulated wall lining.
- X Non-recommended solution.

For all other constructions, or if you are uncertain as to the solution you should adopt, please contact the Kingspan Technical Department (see rear cover for contact details).

Installation of *Kingspan Kooltherm*® K118 Insulated Plasterboard Solutions

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Knauf Plasterboard Adhesive Dabs

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard on Knauf Plasterboard Adhesive Dabs should only be used on dry, clean and relatively flat brick, block or concrete substrates. The guidance below should be followed when installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Knauf Plasterboard Adhesive Dabs.

- Services may be contained within the depth of the dab provided (10 – 25 mm) however, where there is inadequate space to incorporate these services behind the Insulated Dry-Lining, minimum chasing of the background may be required. Alternatively services should be relocated onto an internal wall or onto the new wall lining surface of *Kingspan Kooltherm*® K118 Insulated Plasterboard.
- Drywall adhesive should only be used when the substrate does not exceed 15 mm in either vertical or horizontal direction. Use a straight edge to determine the gap.
- If the wall tolerances exceed this, a framing system solution should be used instead i.e. metal wall liner, timber battens or independent metal or timber framework.
- Projecting window boards, dado rails, mouldings etc. will need to be removed along with wallpaper and gloss paint in order to provide a key for the adhesive.
- If this is not possible then a framing system solution should be used instead.
- Substrate key or suction can be improved or controlled by the application of a bonding agent such as PVAC conforming to BS 5270-1: 1989 (Bonding agents for use with gypsum plasters and cement. Specification for polyvinyl acetate (PVAC) emulsion bonding agents for indoor use with gypsum building plasters) or equivalent. Where required this should be applied in bands corresponding to the adhesive layout onto the substrate.

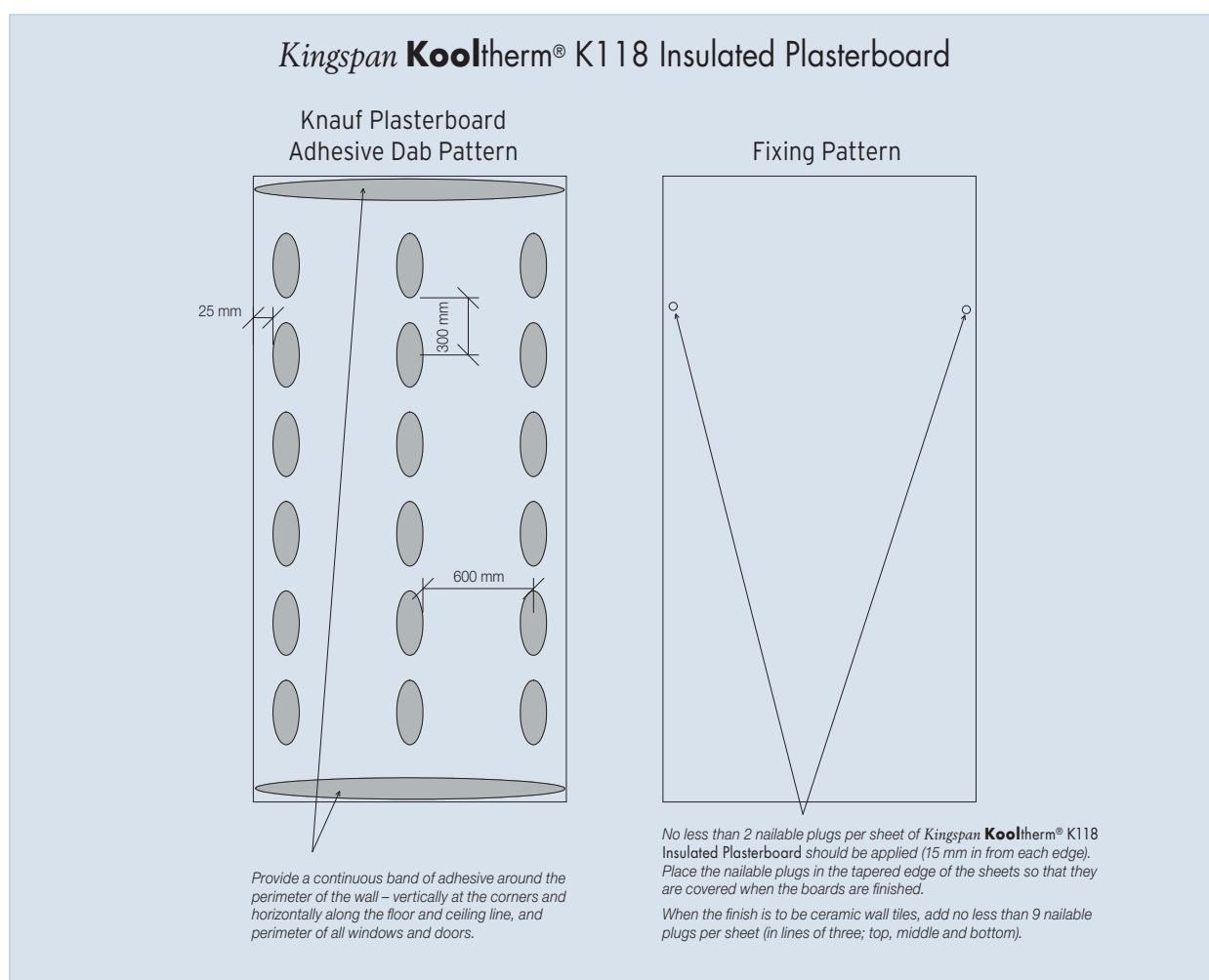


Figure 5: Knauf Plasterboard Adhesive Dab Fixing Pattern

Installation of *Kingspan Kooltherm® K118* Insulated Plasterboard Solutions

- When setting out, use a 10 mm thick packer or shim and a small offcut of *Kingspan Kooltherm® K118 Insulated Plasterboard*, place both onto the highest point of the wall, then use a straight edge and spirit level. Once plumb, draw a short line across the floor and ceiling.
- Extend the lines on the floor and ceiling to the corners of the room by either, snapping a chalk line from one end of the wall to the other or alternatively using a laser level.
- The chalk line or laser line will indicate where the front edge of the board will follow.
- These lines are used as a guide when pressing *Kingspan Kooltherm® K118 Insulated Plasterboard* into place.
- Set out vertical lines at 1200 mm centres onto the masonry to indicate board positioning, marking out any doorway or window openings.
- When ready, apply a continuous band of drywall adhesive around the perimeter of the wall, around openings and around all services. This is to provide support for the board edges.
- Each drywall adhesive dab should be 50 – 75 mm wide and approximately 250 mm long, positioned vertically at 300 mm centres and horizontally at 600 mm centres (the adhesive should cover 20 % (min.) of the board area).

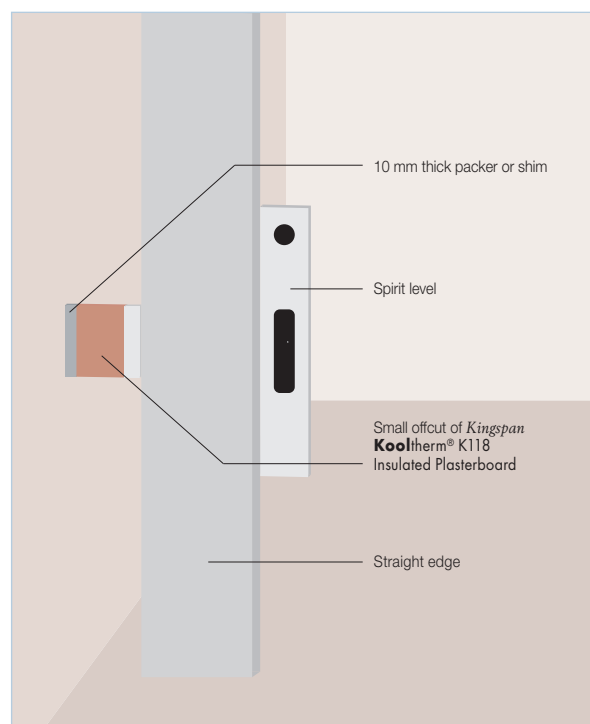


Figure 6: Setting out to install *Kingspan Kooltherm® K118 Insulated Plasterboard*

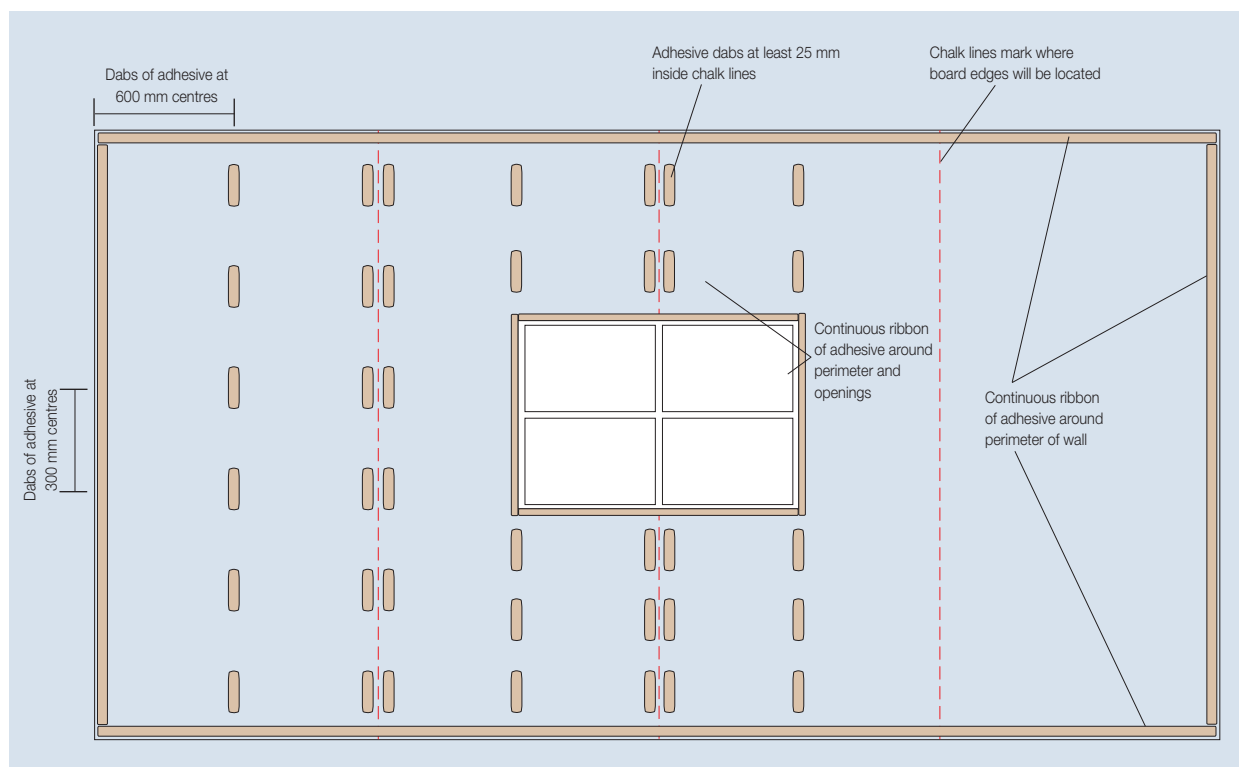


Figure 7: Adhesive Dab & Chalk Line Pattern



Cutting Insulated Plasterboard

The board layout should be planned to minimise cutting. Where cutting is necessary, Kingspan Kooltherm® K118 Insulated Plasterboard should be cut using a fine toothed saw from the plasterboard face, or by cutting through the insulation and paper backing of the plasterboard with a sharp knife, then snapping the system face down over a straight edge and cutting the paper facing of the plasterboard on the other side.

- Kingspan Kooltherm® K118 Insulated Plasterboard should be cut approximately 15 mm short of the floor to ceiling height when adhering the board into position.
- Working from the bottom up, the boards should be positioned on plasterboard packing strips or shims, tapped into position and gently lifted using a foot lifter until the board is tight against the ceiling. Additional packing strips may be inserted at the base to wedge the board in place.
- All adhesive types should be applied approximately 25 mm in from the edge of the boards to avoid bridging the joint.
- Once the adhesive has set (consult manufacturers guidance, this generally takes between 1.5 and 3.5 hours), add a minimum of two appropriate fixings per board (when using Knauf plasterboard adhesive).
- Fixings should be added 15 mm in from the tapered edge so that they are covered when the boards are jointed or skimmed.
- Select fixings of a sufficient length to give a 25 mm (min.) penetration into the masonry (unless otherwise stated by the fixing manufacturer).
- Drive each plug in until the head is slightly below the plasterboard without fracturing it.
- Further boards should be installed and lightly butted together to complete the lining.
- Upon completion of the Kingspan Kooltherm® K118 Insulated Plasterboard installation, seal the perimeter of the board and fill the 15 mm clearance gap at the bottom of the wall to provide an airtight seal (see page 33 for guidance on the most appropriate sealant).



Figure 8: Appropriate fixing
e.g. nailable Plug

Installation of *Kingspan Kooltherm*® K118 Insulated Plasterboard Solutions

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Alternative Gypsum Adhesives

The guidance below should be followed when installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with alternative gypsum adhesives.

- For drywall adhesives other than Knauf plasterboard adhesive, the reverse side of *Kingspan Kooltherm*® K118 Insulated Plasterboard (the foil facing) will require the use of a bonding agent. Apply one coat (min.) around the perimeter and middle of the board, ensuring it corresponds and keys with the drywall adhesive.
- For all gypsum based drywall / plasterboard adhesive brands other than Knauf plasterboard adhesive, the amount of secondary fixings required should be increased to six appropriate fixings per board, in addition to the bonding agent required to the foil facing of the board.

Except for the alternative adhesives solutions discussed, installation should take place as described in the Knauf Plasterboard Adhesive Dabs section.

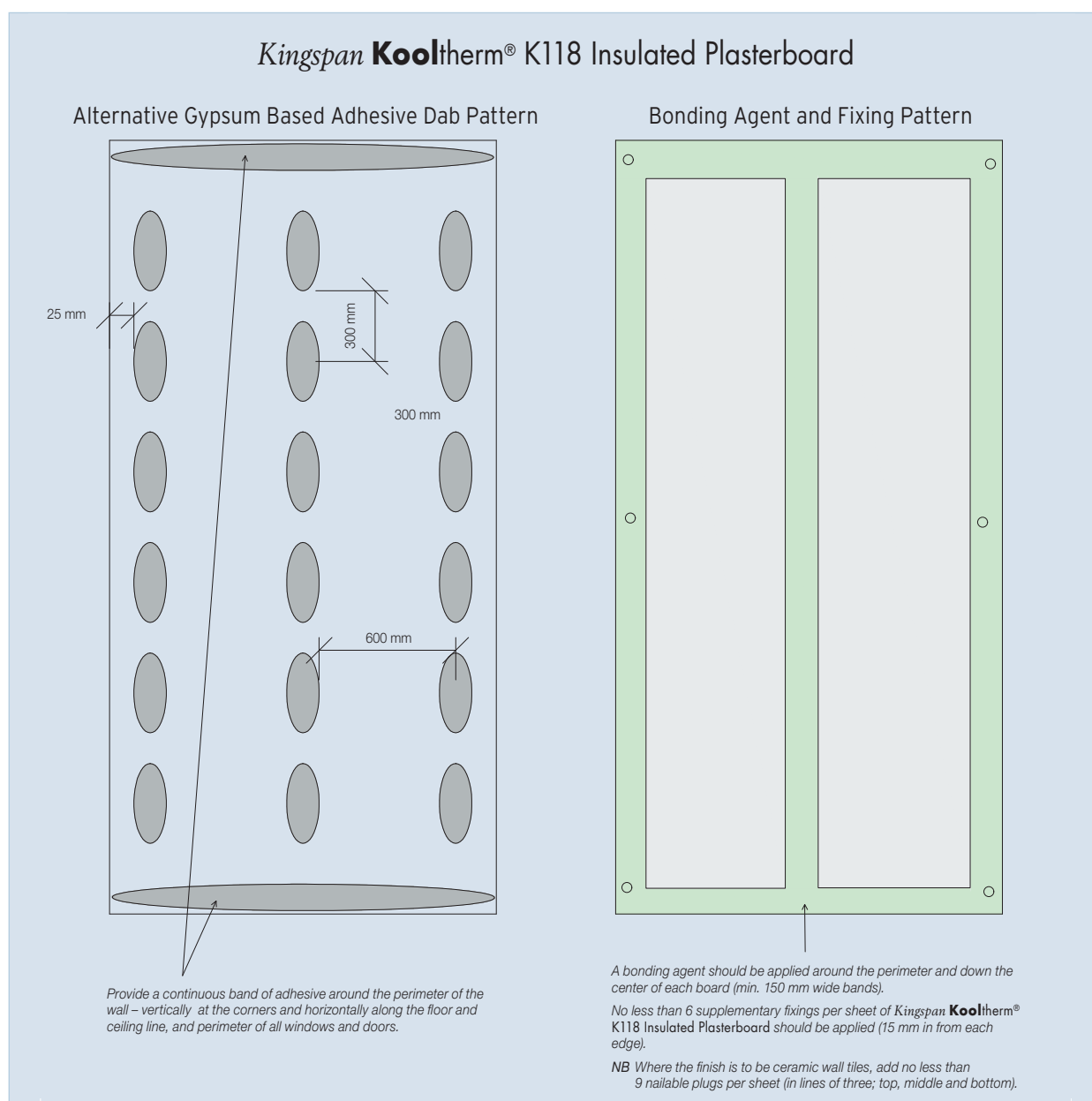


Figure 8: Alternative Gypsum Based Adhesive Dab and Fixing Pattern

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Acrylic Sealant Adhesive Blobs or Low Expanding PU Foam Adhesive Beads

Kingspan Kooltherm® K118 Insulated Plasterboard on acrylic adhesive blobs or low expansion PU adhesive beads should only be used for relatively flat brick, block, concrete or pre-plastered, pre-lined (plasterboard on framing or lath and plaster on framing) substrates.

The same setting out guidelines shown in the Knauf plasterboard adhesive section may be followed for this application however the following guidelines should also be adopted.

- When installing *Kingspan Kooltherm*® K118 Insulated Plasterboard on acrylic adhesive blobs or low expansion PU foam adhesive beads, a 2 / 3 mm thick shim and small offcut of *Kingspan Kooltherm*® K118 Insulated Plasterboard should be used to determine the position of the new wall lining (this is shown in figure 6 but with a 10 mm shim). Once plumb, draw a short line across the floor and ceiling and follow the adhesive patterns shown in figures 9 and 10.
- Acrylic adhesives and low expansion PU foam adhesives compress down causing the board to sit flush with the existing wall. It is important to note that the new wall lining will follow the contour of the existing wall therefore ensure the deviation (existing wall alignment tolerance) from the highest point to the lowest point does not exceed a 5 mm gap in any direction (vertical or horizontal) when measured with a 2 m straight edge. This attachment method must only be used where the background alignment is satisfactory.
- Ensure there is space for new services, if required. The *Kingspan Kooltherm*® K118 Insulated Plasterboard will sit flush against the substrate leaving no cavity behind for cabling and pipework etc. The background should be chased out provided the depth of chase can be accommodated in the thickness of the existing wall. Existing services should be assessed by a competent person before installation to determine any alterations that may need to be made. Where services already exist within the substrate or are contained within an existing framework then extending the cable or pipework and repositioning switches / sockets may only be required. Some services may need to be positioned on an internal wall or on the surface of the new wall lining.

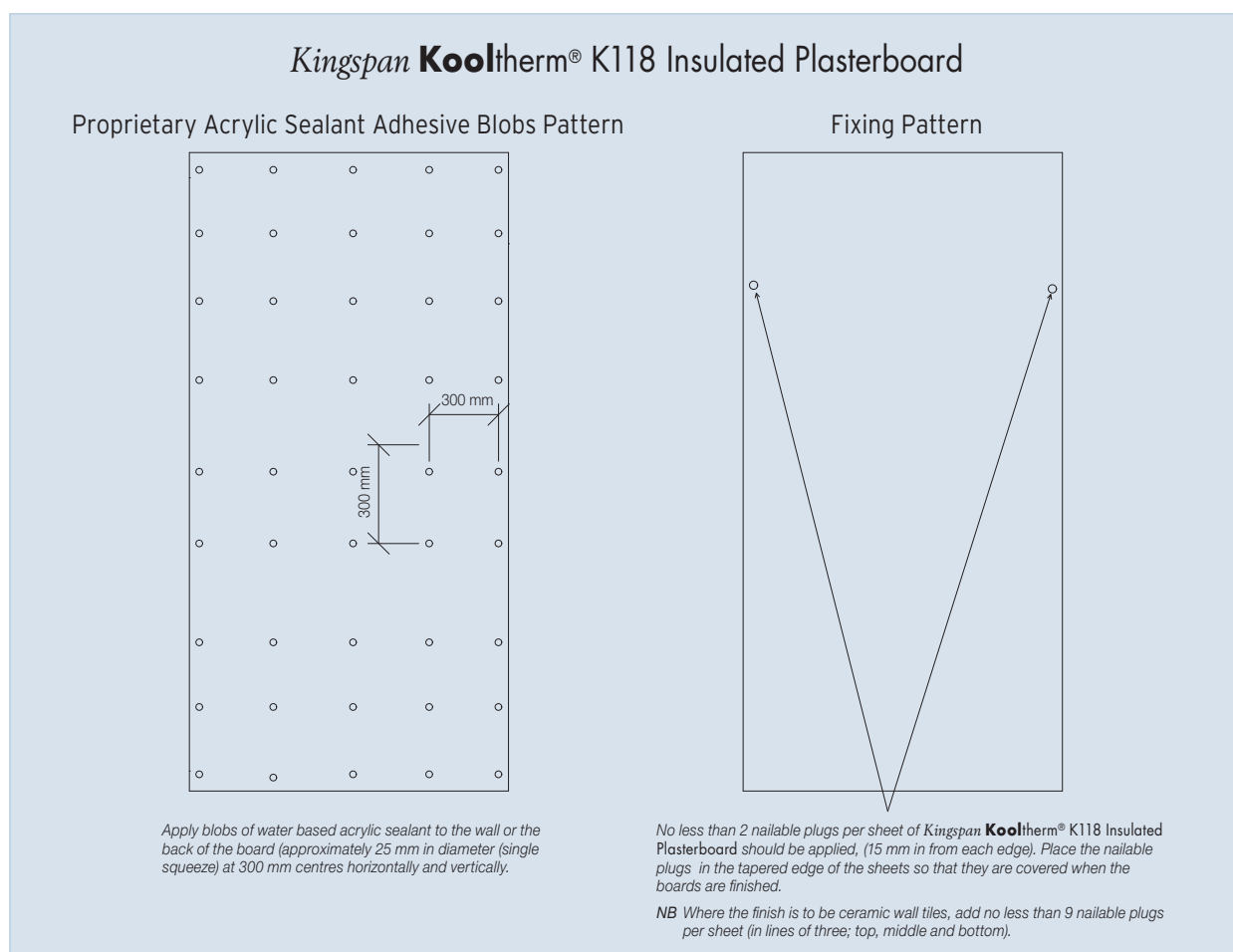


Figure 9: Acrylic Sealant Adhesive Pattern

Installation of *Kingspan Kooltherm® K118* Insulated Plasterboard Solutions

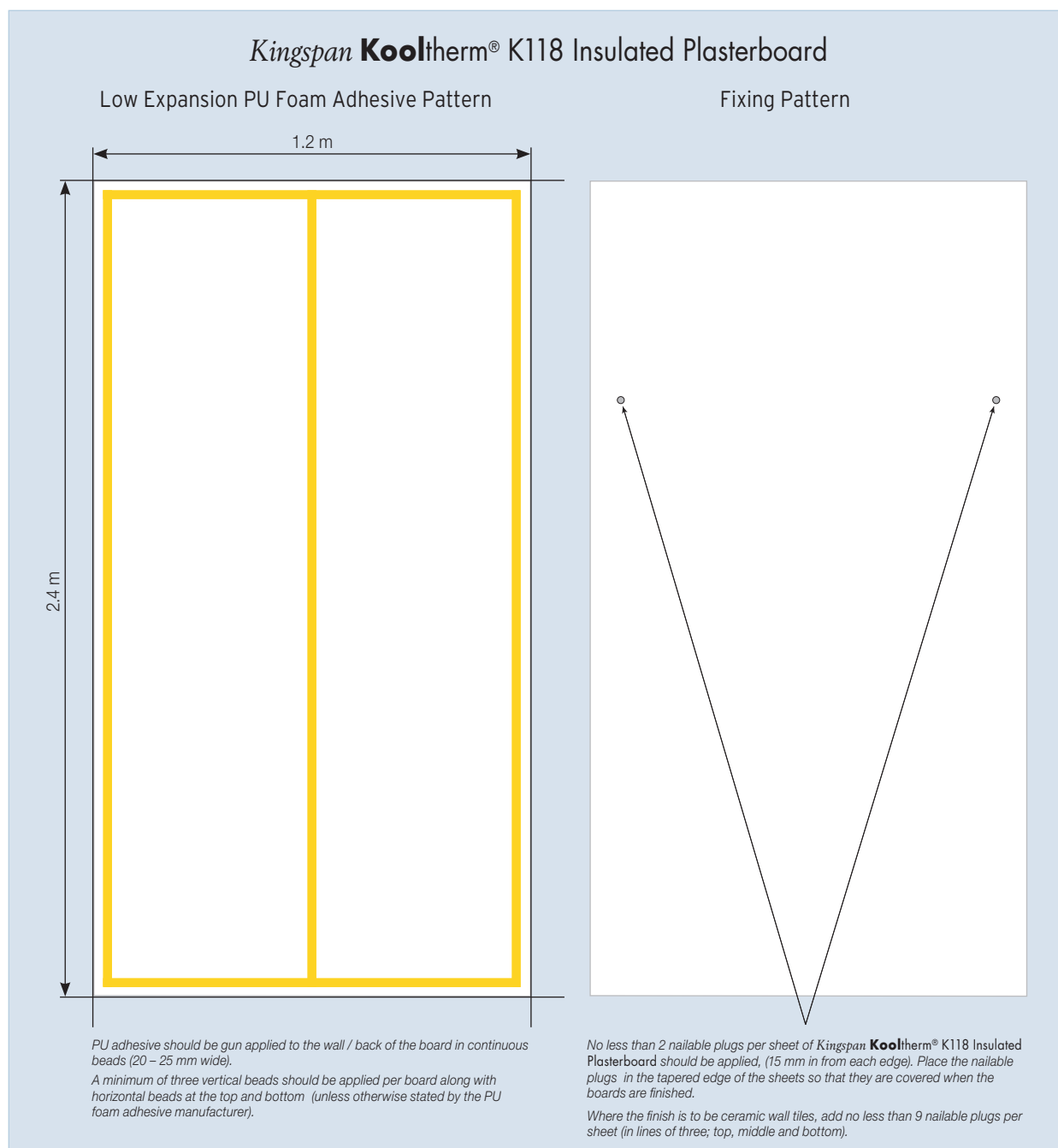


Figure 10: Low Expansion PU Foam Adhesive Pattern

- Once the adhesive has set (acrylic sealant adhesive will grab instantly, and sets within the hour, for PU foam adhesive there is approximately five minutes cure time, and again sets within the hour. Always consult manufacturers guidelines), apply a minimum of two appropriate fixings per board as shown in figures 9 and 10.
- Select fixings of sufficient length to give a 25 mm (min.) penetration into the masonry (excluding existing plaster), unless otherwise stated by the fixing manufacturer.
- Where there is an existing lining, select appropriate fixings of sufficient length to give a 25 mm penetration into timber, or 10 mm penetration into metal framework supported linings (excluding the plasterboard or lath and plaster).
- Drive each fixing in until the head is slightly below the plasterboard without fracturing it.
- Further boards should be installed and lightly butted together in order to complete the lining.
- Upon completion of the *Kingspan Kooltherm® K118* Insulated Plasterboard installation, seal the perimeter of the board and fill the 15 mm clearance gap at the bottom of the wall to provide an airtight seal (see page 33 for guidance on the most appropriate sealant).

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Metal Wall Liner Systems

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard on metal wall liner systems may be used on any dry, stable masonry construction capable of taking the fixings for the metal wall brackets. The guidance below should be followed when installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with metal wall liner systems.

- This method is appropriate where substantial background irregularities or a large cavity (> 25 mm) requires correcting to accommodate existing or new services.
- Metal wall liners are extremely versatile and can be set between 20 – 175 mm (subject to the manufacturers recommendations) in order to correct background alignment and ensure the correct depth is used to incorporate services where they have been designed to go behind the insulated plasterboard.
- Determine the maximum undulation (high point) on the wall or service protrusion (whichever is greater), this will determine the cavity depth required.
- Chalk lines should be marked to the floor and ceiling to indicate positioning of the metal tracks, which are then fixed to the floor, wall and ceiling perimeters at 600 mm centres (max.) using appropriate fixings.
- Vertical lines should be marked on the wall at 600 mm horizontal centres (max.) to indicate the position for the lining channels. Horizontal lines should also be marked at 800 – 900 mm vertical centres to indicate the fixing positions for the stand-off brackets. The brackets should be fixed into position using appropriate fixings.
- Lining Channels should be fitted and fixed at 600 mm centres (max.) into the metal tracks at ceiling and floor level, in line with the stand-off bracket positions, using appropriate fixings for the proprietary system, and extended if required. The bracket legs on the stand-off brackets should be bent forward. Screws should then be inserted through the brackets and fixed to the lining channels using appropriate fixings, such as 13 mm Wafer Headed Drywall Screws or Jack Point Screws.
- The protruding bracket legs should be bent back to sit clear of the channel face.
- For internal angles / corners, position a lining channel (or track, depending upon the metal framing system used) tight into the corner in order to provide support for the lining.

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with Pre-Treated Timber Battens

Kingspan Kooltherm® K118 Insulated Plasterboard may be used on timber frame constructions or on any dry, stable masonry construction capable of taking the fixings for the timber battens.

The guidance below should be followed when installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with pre-treated timber battens:

- Timber battens can be packed out using proprietary shims in order to correct alignment and provide space to accommodate services.
- Ensure the correct timber batten depth is used if services are designed to go behind the insulated plasterboard.
- 25 x 47 mm pre-treated timber battens should be used as a minimum when lining masonry walls.
- Walls are to be marked at 600 mm centres (max.) to indicate vertical batten and board positioning.
- Timber battens should be fixed vertically at 600 mm centres (max.) to support the boards around the perimeter of the wall, windows and doors and any services which penetrate the system.
- The required number of battens should be protected by 75 mm (min.) wide DPC, fixed to the back of the batten with staples or contact adhesive.
- Timbers with DPC should then be screw fixed to the substrate at 600 mm (max.) centres using appropriate fixings.
- Fixings for the battens should be installed approximately 75 mm from the ends of each timber batten and positioned no more than 600 mm centres apart.

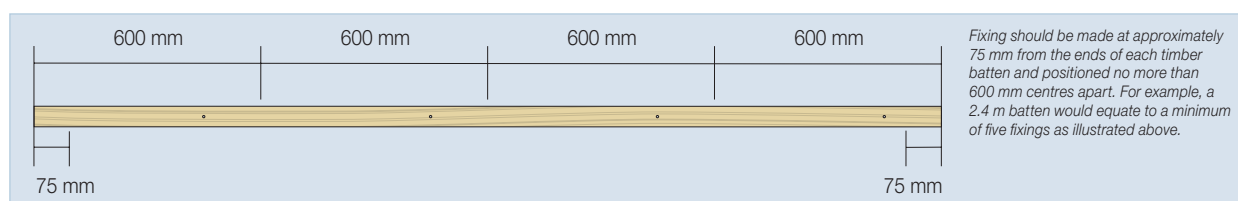


Figure 11: Fixing the Batten

Installation of *Kingspan Kooltherm*® K118 Insulated Plasterboard Solutions

Installing *Kingspan Kooltherm*® K118 Insulated Plasterboard to Metal or Timber Framework

The guidance below should be followed when installing *Kingspan Kooltherm*® K118 Insulated Plasterboard with metal or timber framework.

- Horizontal board joints should be backed with metal fixing straps or fixing t's for metal framework, or timber battens / timber noggins for timber framework. These should be located where required.
- *Kingspan Kooltherm*® K118 Insulated Plasterboard should be located centrally over the metal or timber framing. *Kingspan Kooltherm*® K118 Insulated Plasterboard should be firmly held against the framing after being cut to allow for a 5 mm height clearance.
- *Kingspan Kooltherm*® K118 Insulated Plasterboard should be fixed to all the framing members using drywall screws at 300 mm centres, (reduced to 200 mm centres at external corners for metal and timber framework solutions).
- Alternatively, for timber framework, plasterboard nails may be used provided they are set at 150 mm centres.
- Boards should be lightly butted, with screws/nails no closer than 10 mm from bound edges and 13 mm from cut edges.
- Each sheet of insulated plasterboard should lap the framing by 19 mm (min.) at board joints.
- Appropriate length screws should be selected to provide a nominal 10 mm penetration into metal, or 25 mm for timber studs.
- For timber battens, the fixings should be long enough to allow a 22.5 mm penetration.
- Fixings should be selected to avoid contact with the masonry background.
- Fixings should be driven straight, with the heads embedded just below the surface of the plasterboard without fracturing it.
- Further boards should be installed and lightly butted together to complete the lining.
- On completion of *Kingspan Kooltherm*® K118 Insulated Plasterboard, seal the perimeter and fill the 5 mm clearance gap at the bottom of the wall to provide an airtight seal (see page 33 for guidance on the most appropriate sealant).

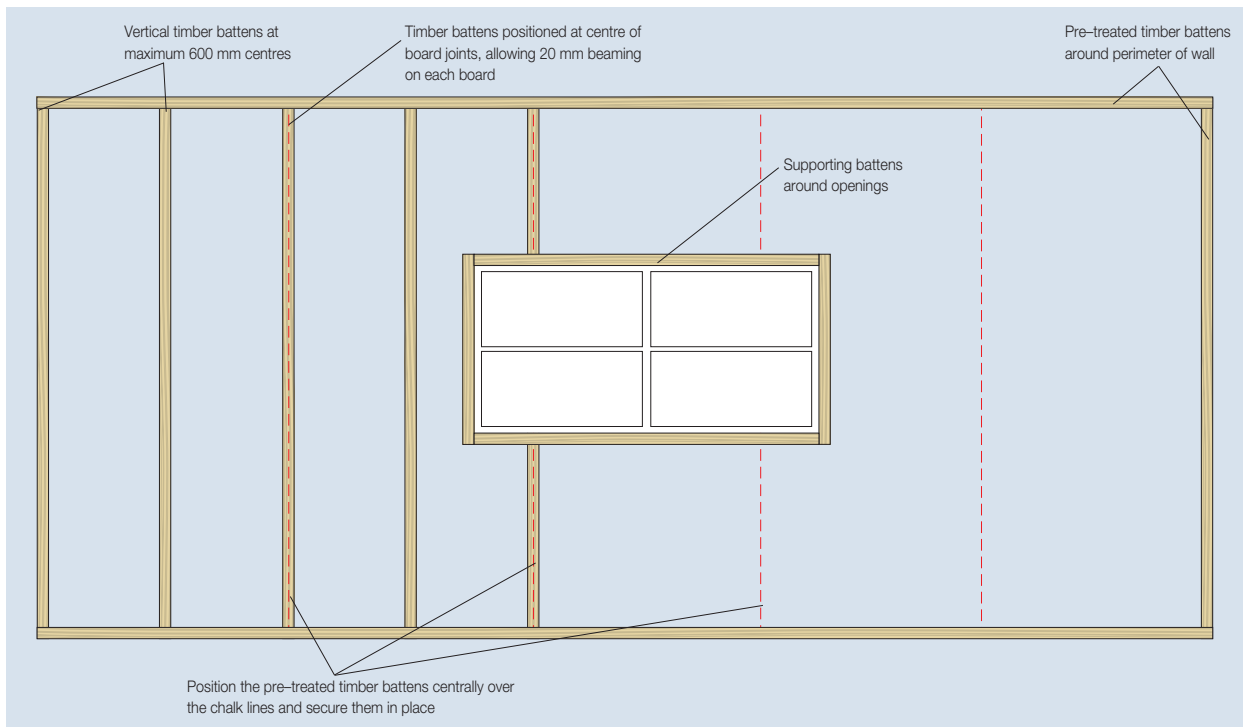


Figure 12: Timber Batten Positioning

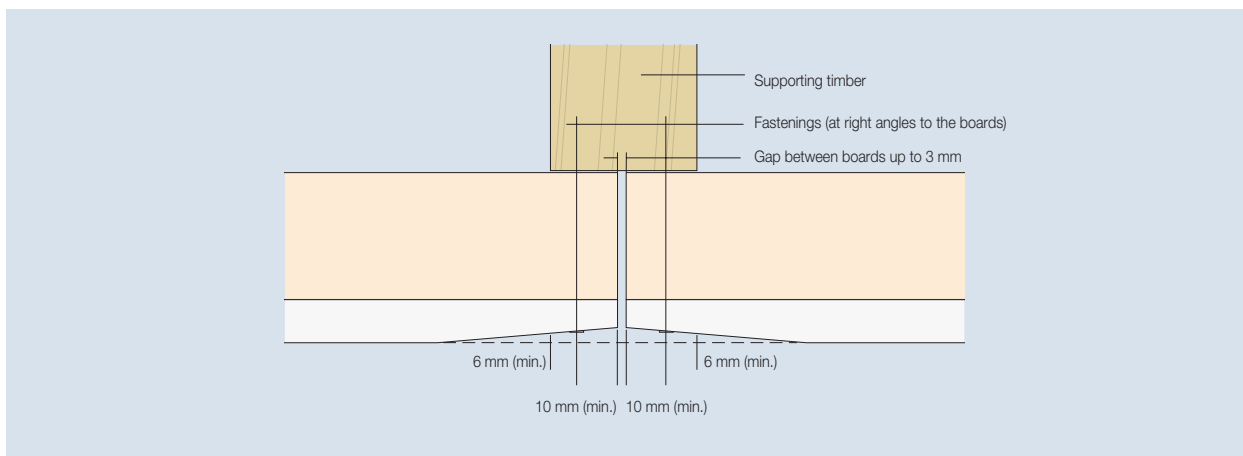


Figure 13: Fastenings for Supporting Timber

Installation of *Kingspan Kooltherm®* K118 Insulated Plasterboard Solutions

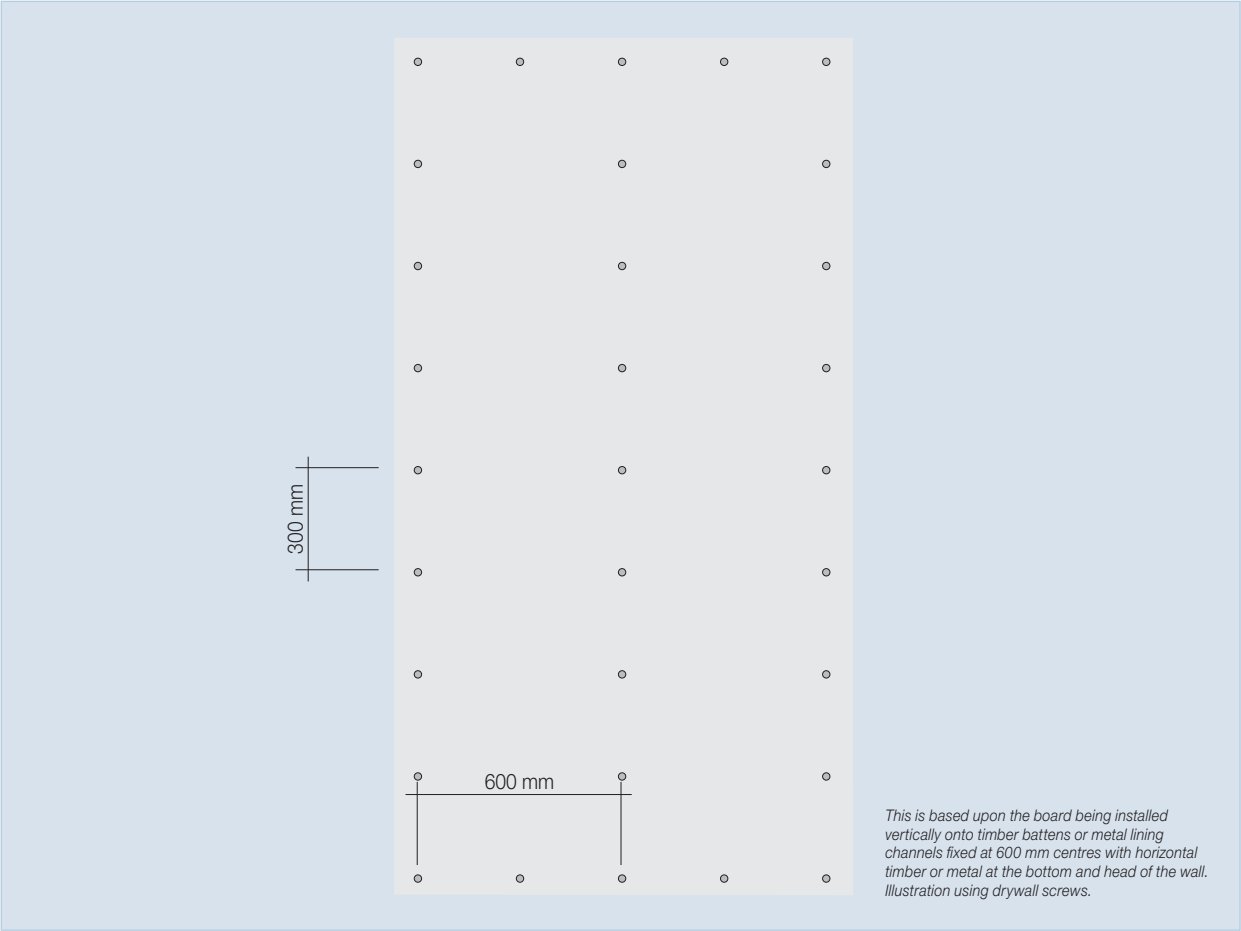


Figure 14: Drywall Screw Fixing Pattern

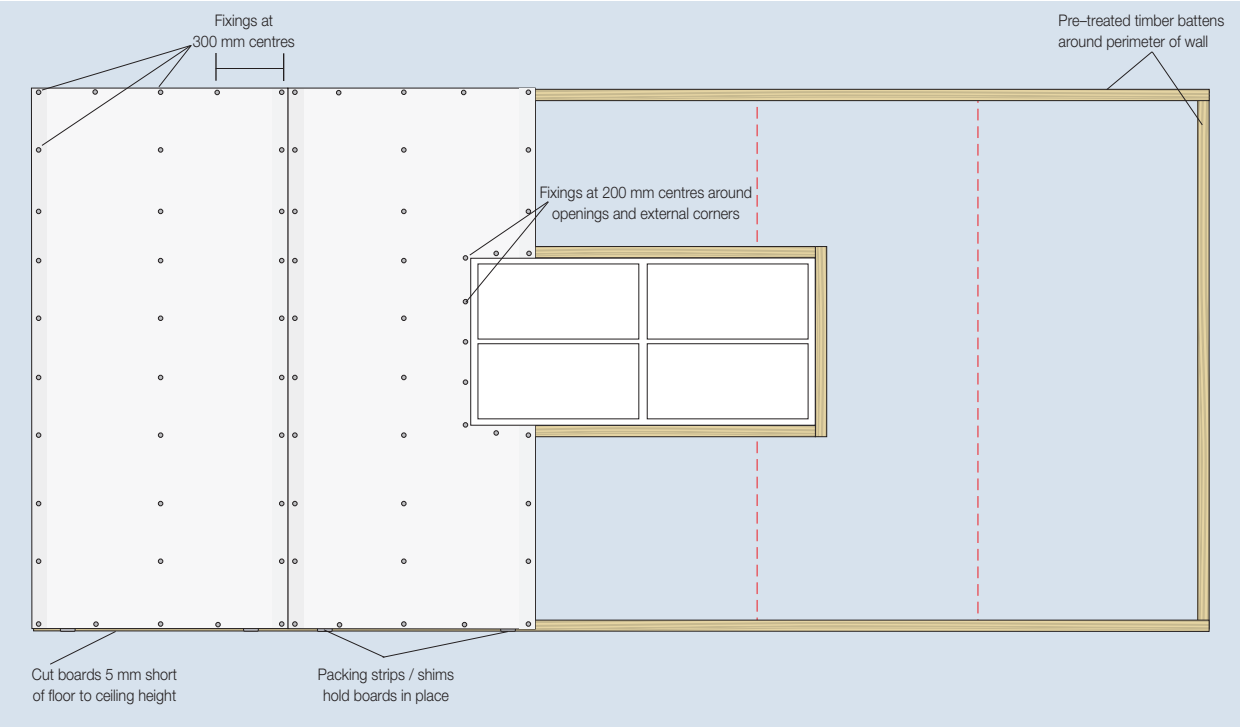


Figure 15: Drywall Screw Fixing Pattern

Fixtures and Fittings Installation Details

As with any dry-lining system, adding fixtures and fittings needs care and attention to make sure they are safe, secure and fit for purpose.



Fixing Weights

Always consult the fixing manufacturer as to the actual load that can be applied per fixing as weights will vary depending on type of fixing and manufacturer.

Fixture	Example	Description	Fixing
Lightweight (up to 8 kg)	Mirrors, lamps, sockets, lightweight shelving, towel rails, skirting boards, cable clamps or floor-supported radiators	No pre-drilling is required as these fixings cut their own hole and form their own thread within the <i>Kingspan Kooltherm® K118 Insulated Plasterboard</i> element. They are available either in nylon or metal and are usually supplied with a suitable screw. They usually provide safe working loads of up to 8 kg per fixing (depends on type and manufacturer as to the actual load that can be applied).	Self-drilling drvwall anchor fixings 
Medium (9 – 20 kg)	Shelves, mirrors, lightweight cupboards, bathroom cabinets	For medium weight fittings use metal cavity fixings as they transfer the load behind the plasterboard and the stresses are put on to a wider area of the board. The steel expanding “umbrella” type of fixings will usually provide safe working loads of 12 kg per fixing. These type of fixings have the advantage that it can be placed in the drill hole before offering up the fixture, making installation much easier. It also allows the fixture to be demounted and refitted again very easily without losing the fixing in the cavity. The disadvantage is that this type of fixing is permanently expanded so although the screw is removable the anchor body is extremely difficult to dismantle at a later date. For this reason it should not be used for applications where fixing removal is required in the future.	Steel expanding cavity fixings ('umbrella' fixings) 

Fixtures and Fittings Installation Details

Fixture	Example	Description	Fixing
Heavy (over 21 kg)	Kitchen cupboards, wall mounted radiators, basins, worktops, baths, shelving, TVs, plasma screens	Any object fixed to Kingspan Kooltherm® K118 Insulated Plasterboard other than light or medium weight fixtures should only be fixed through the Kingspan Kooltherm® K118 Insulated Plasterboard into the masonry substrate, pre-treated timber battens, timber noggins or plywood pattressing. Use Anchor Fixings for fixing through to masonry. Use self tapping wood screws for fixing through to timber noggins / battens. Use Steel expanding cavity fixings ('umbrella' fixings) for fixing through to plywood pattressing. An alternative method for attaching heavyweight items to Kingspan Kooltherm® K118 Insulated Plasterboard on pre-treated timber battens is to fix 18 mm (min.) plywood sheet / pattresses in between the timber battens where the heavy items are to be located. It will usually require a deeper pre-treated timber batten than 25 mm in order to accommodate the depth of plywood and support timbers. Plywood sheets / pattresses should fit flush to the pre-treated timber batten surface. This method makes it a lot easier for the installer to find a secure substrate to fix into as there is a continuous timber substrate and no time lost in trying to find the batten or noggin to fix the heavy weight object into. When fixing heavier items, allowance should be made at the design stage as to where these items are to be located as additional strength and support to the boards will be needed. This includes additional timbers (when using a pre-treated timber batten system) or additional ribbons of adhesive (when using a gypsum based adhesive system), should be placed on the substrate prior to attaching the Kingspan Kooltherm® K118 Insulated Plasterboard.	Steel Bolt / Anchor / Frame fixings    

Ceramic Wall Tiles

The guidance below should be followed when installing *Kingspan Kooltherm® K118 Insulated Plasterboard* with ceramic wall tiles.

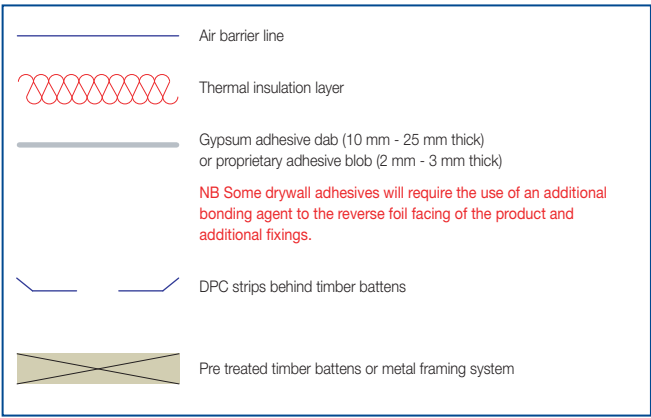
- If *Kingspan Kooltherm® K118 Insulated Plasterboard* is to receive ceramic wall tiles, additional support will be required to prevent flexing taking place.
- When using pre-treated timber battens as the supporting framework, battens should be positioned at no more than 400 mm centres. Additional intermediate timbers will need to be placed at 1200 mm centres horizontally.
- When using a metal framing system as the supporting framework, the lining channels should be positioned at 400 mm centres max. The stand-off brackets which support the lining channels should be positioned at closer vertical centres, generally 600 mm vertical centres (instead of the usual 800 – 900 mm).
- When using adhesive as the supporting framework, additional support will again be required. If using gypsum based dabs, place horizontal dabs at 1/3 centres in height, in addition to the regular amount of dabs required.
- As well as extra adhesive, extra fixings will also be required, increasing the amount of supplementary fixings to a total of nine fixings per board (three in the top, middle and bottom).
- Installation of the ceramic wall tiles should not be applied to the face of *Kingspan Kooltherm® K118 Insulated Plasterboard* until ten days post installing the adhesive fixed lining.
- For all methods, the maximum height of *Kingspan Kooltherm® K118 Insulated Plasterboard* when using ceramic wall tiles should not exceed 3600 mm in height.
- Prior to plastering, tiles ≤ 12.5 mm thick with a maximum mass / unit area of 32 kg/m² can be accommodated onto *Kingspan Kooltherm® K118 Insulated Plasterboard* using a suitable thin bed adhesive (nominally 3 mm thick).
- Tiles $\leq$ with a maximum mass / unit area of 20 kg/m² can be accommodated onto *Kingspan Kooltherm® K118 Insulated Plasterboard* if the system has already been finished in plaster.

Light - Heavy Wall Mounted Fittings

The guidance below should be followed when installing *Kingspan Kooltherm® K118 Insulated Plasterboard* with light – heavy wall mounted fittings.

- Lightweight wall mounted fittings such as mirrors, lamps, light switches, sockets, lightweight shelving, towel rails, cable clamps or floor-supported radiators, can be fixed directly into *Kingspan Kooltherm® K118 Insulated Plasterboard*. A common method of installation requires the use of self-drilling drywall anchor fixings and toggle or umbrella type plasterboard fixings.
- Additional bands of adhesive horizontal steel fixing t's, steel fixing straps, pattressing or timber battens depending on the method adopted, should be applied where medium – heavyweight wall mounted fittings are installed and to support unsupported board edges.
- For medium – heavy weight wall mounted fittings, always use appropriate fixings to fix through the insulated dry-lining and into the masonry structure behind or, into the framework supporting *Kingspan Kooltherm® K118 Insulated Plasterboard*, placing additional timbers, steel horizontal fixing channels, or plywood pattressing on relevant supports where required.

Details Key



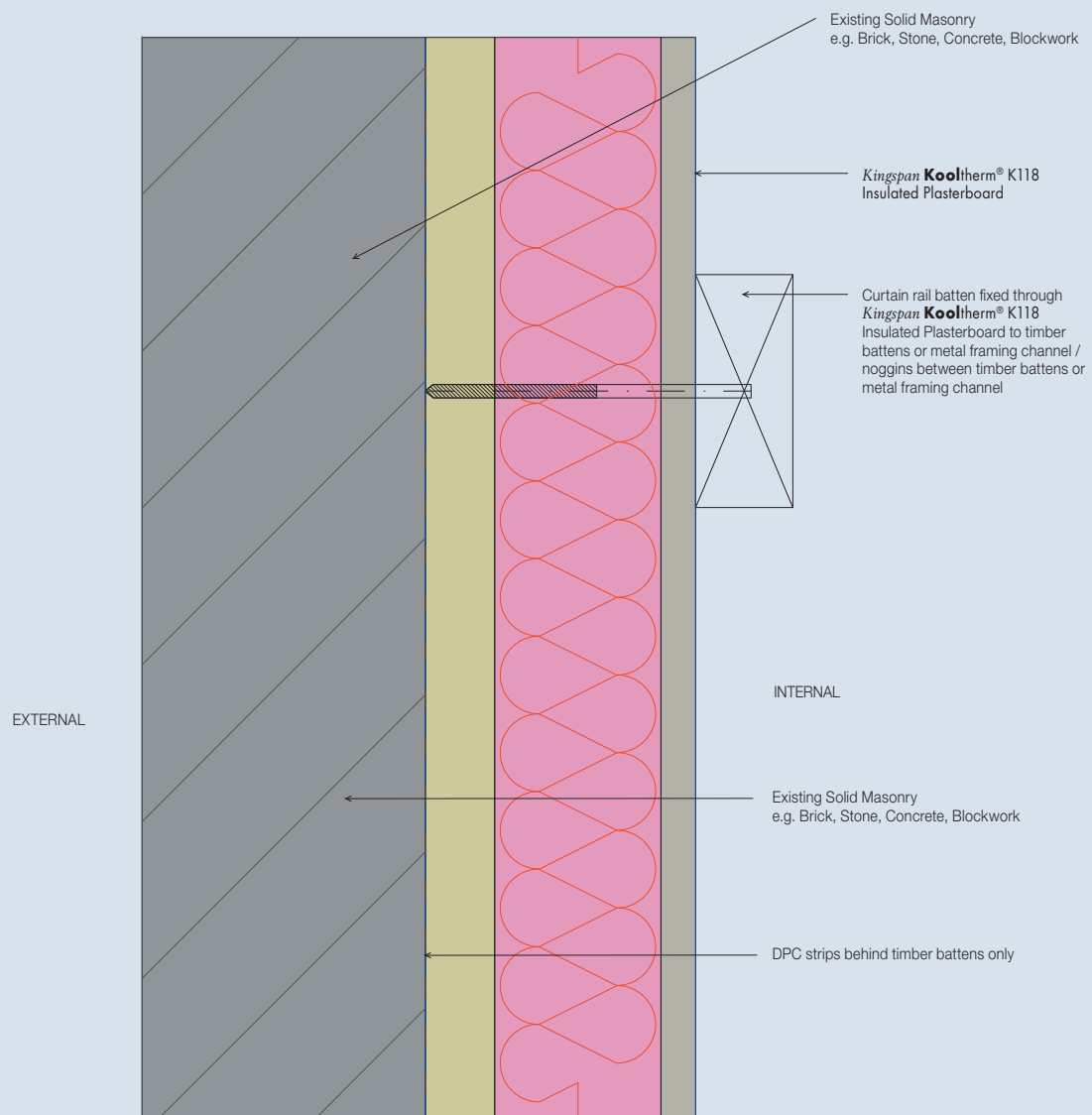


Figure 16: Curtain or Hand Rail Detail (Mechanically Fixed)

Fixtures and Fittings Installation Details

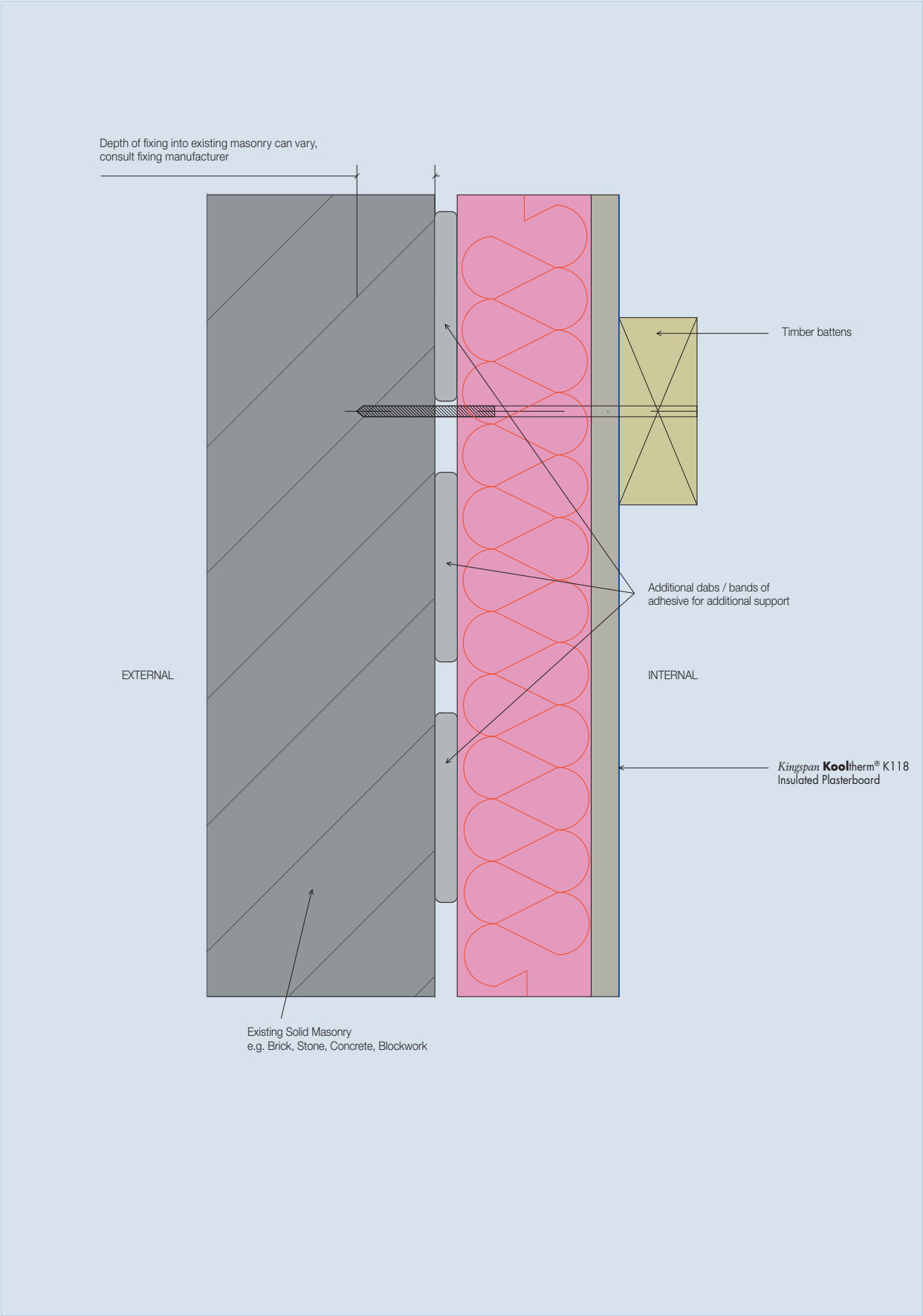


Figure 17: Curtain or Hand Rail Detail (Adhered)

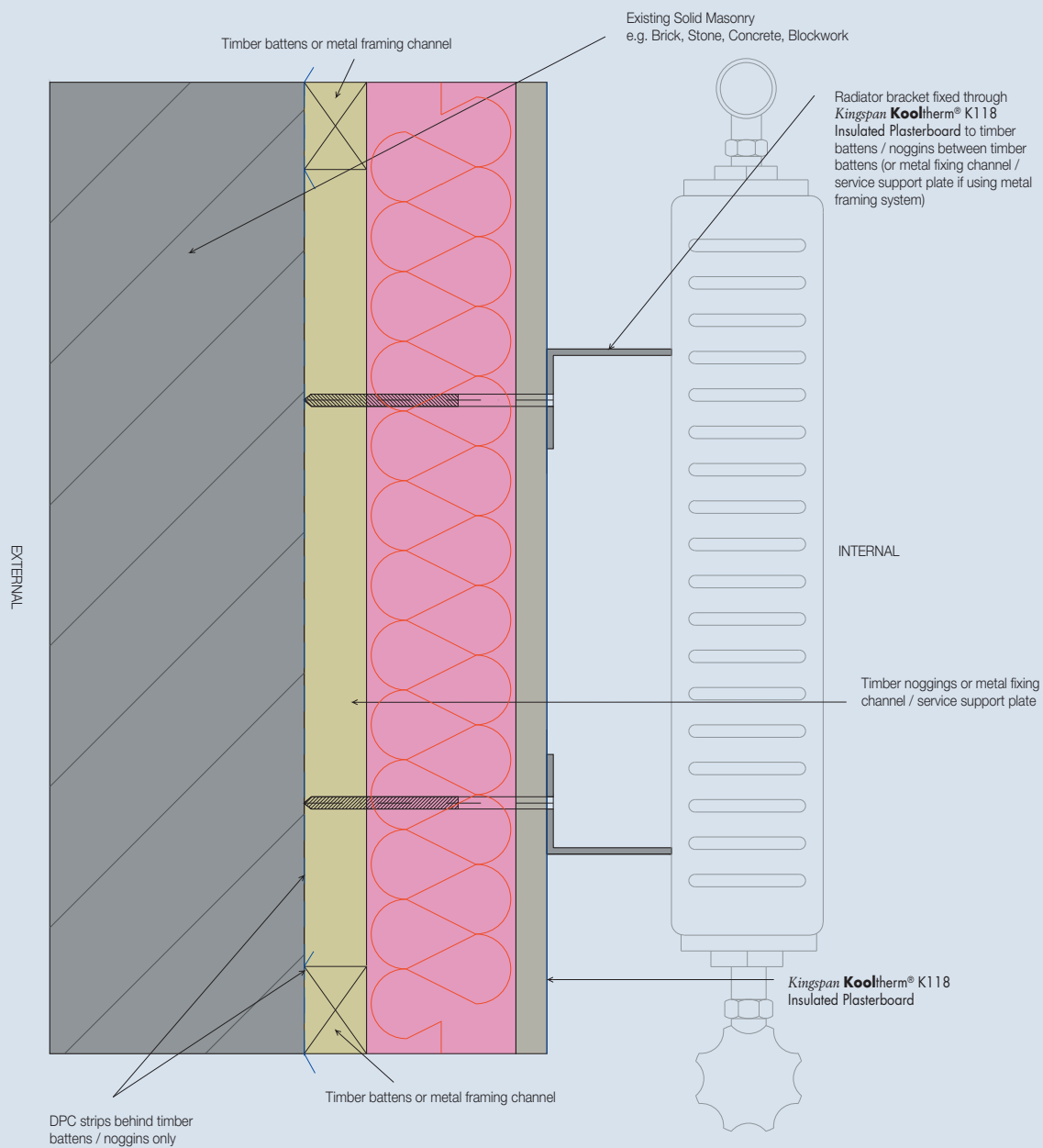


Figure 18: Surface Mounted Radiator Detail (Mechanically Fixed)

Fixtures and Fittings Installation Details

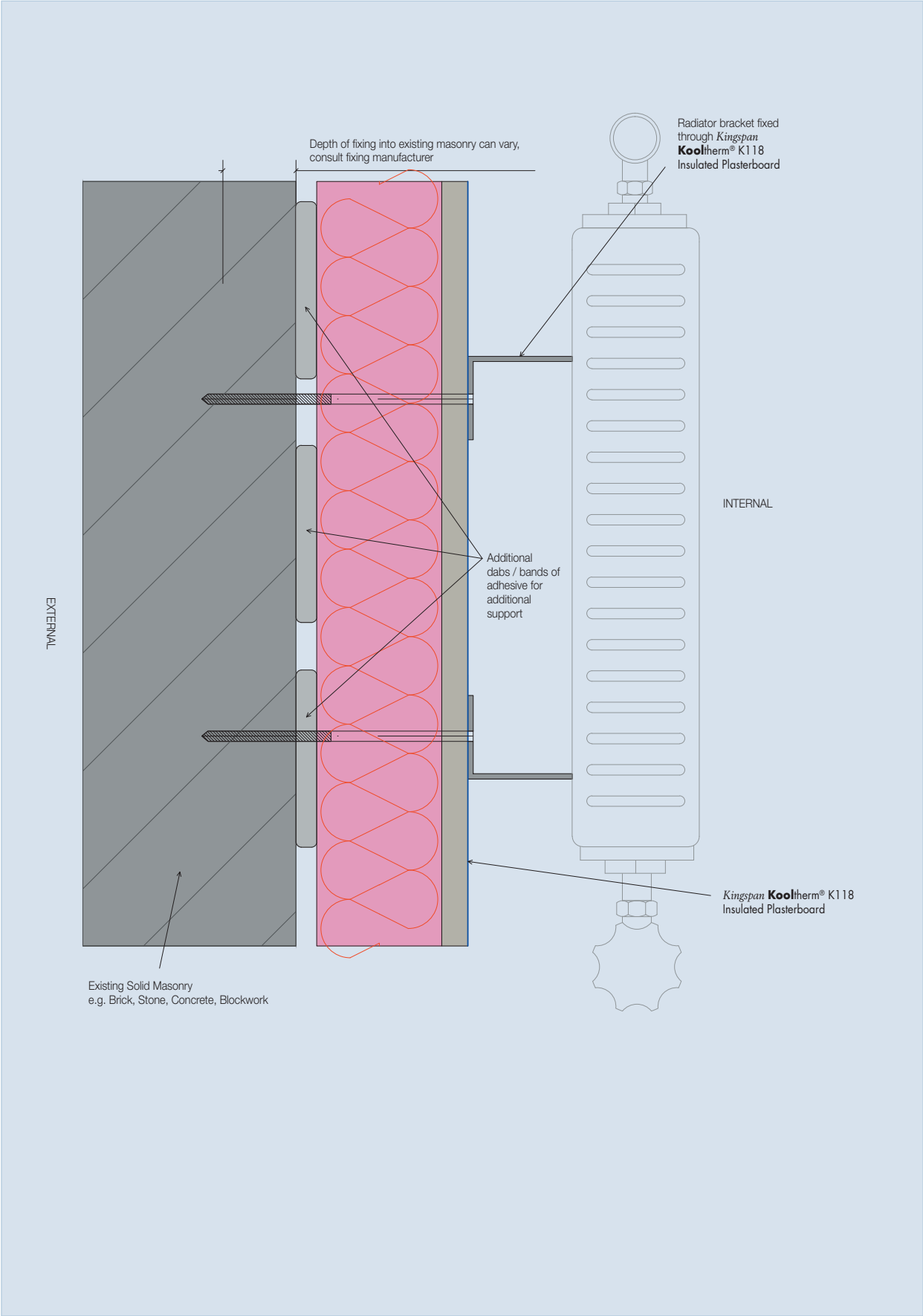


Figure 19: Surface Mounted Radiator Detail (Adhered)

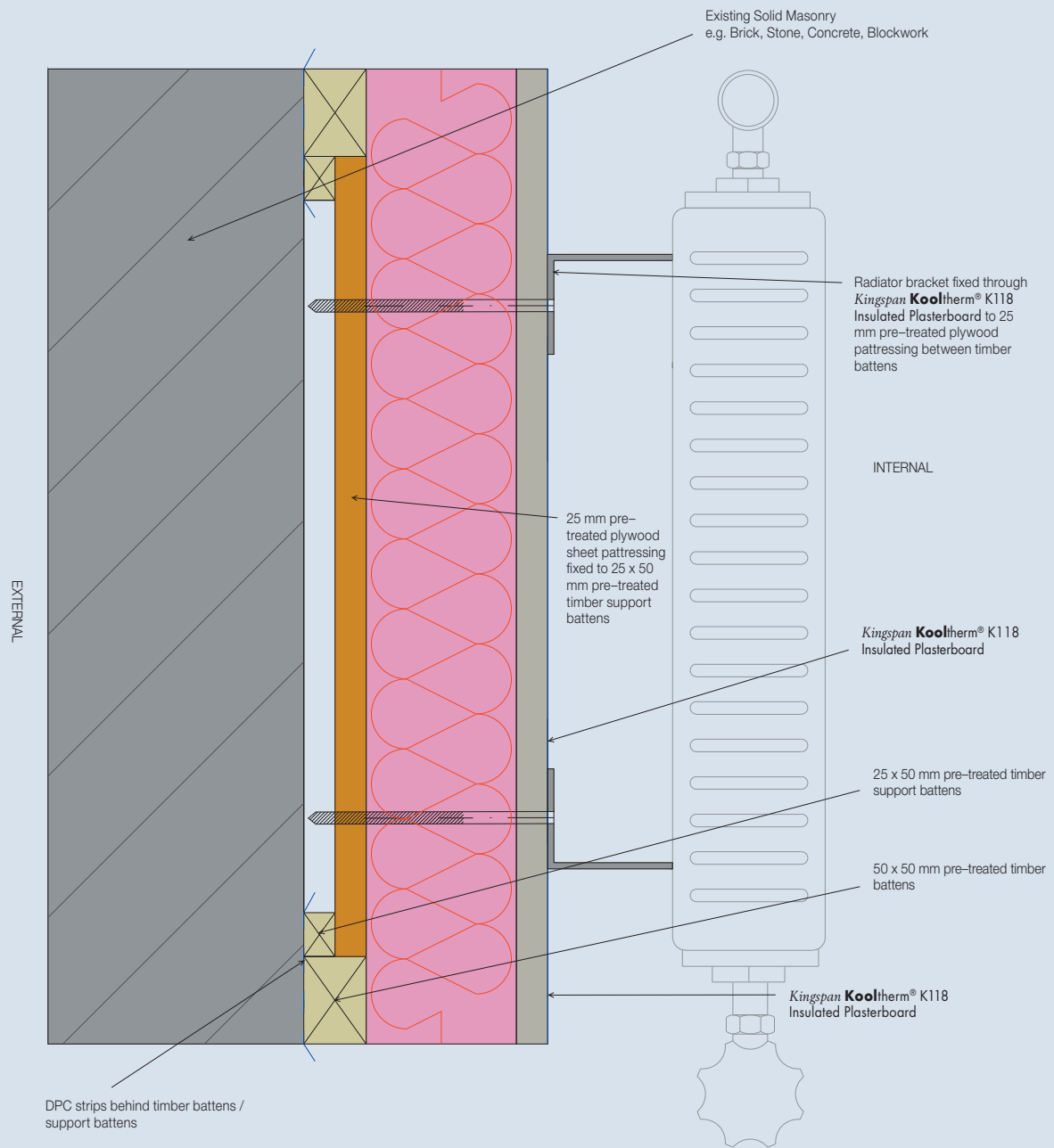


Figure 20: Alternative Surface Mounted Radiator Detail (Mechanically Fixed)

Fixtures and Fittings Installation Details

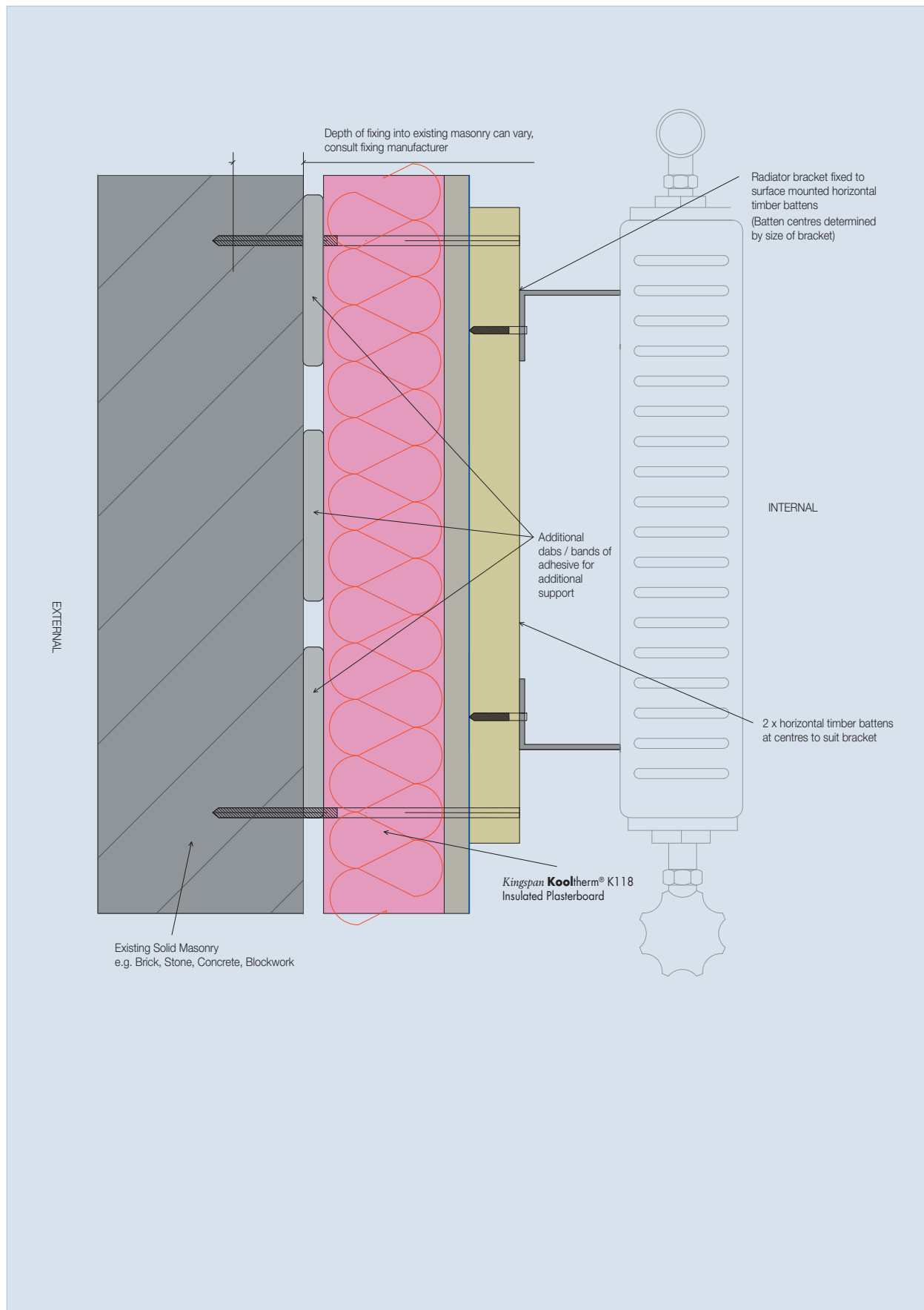


Figure 21: Alternative Surface Mounted Radiator Detail (Adhered)

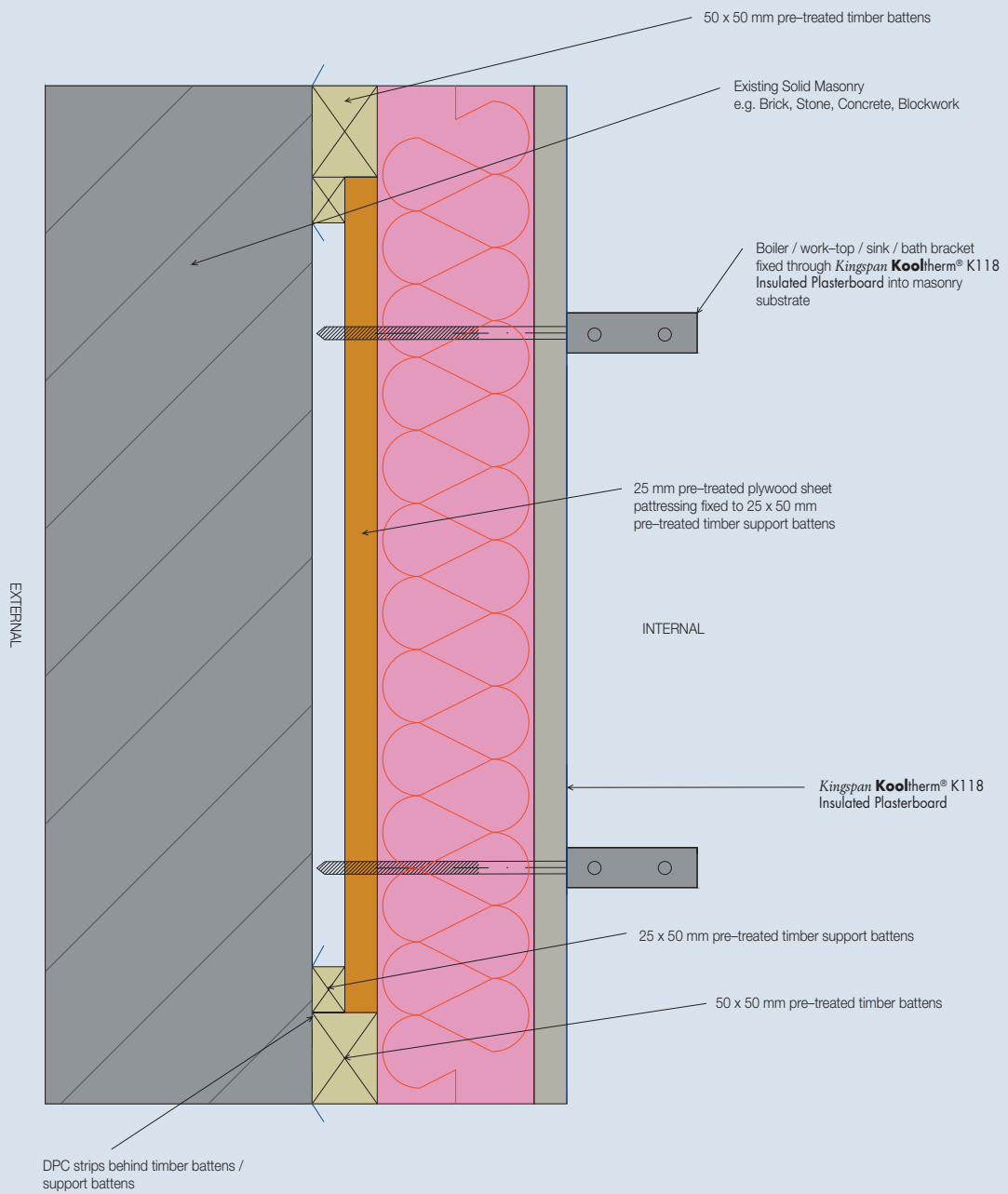


Figure 22: Heavy Surface Mounted Fittings Detail (Mechanically Fixed)

Fixtures and Fittings Installation Details

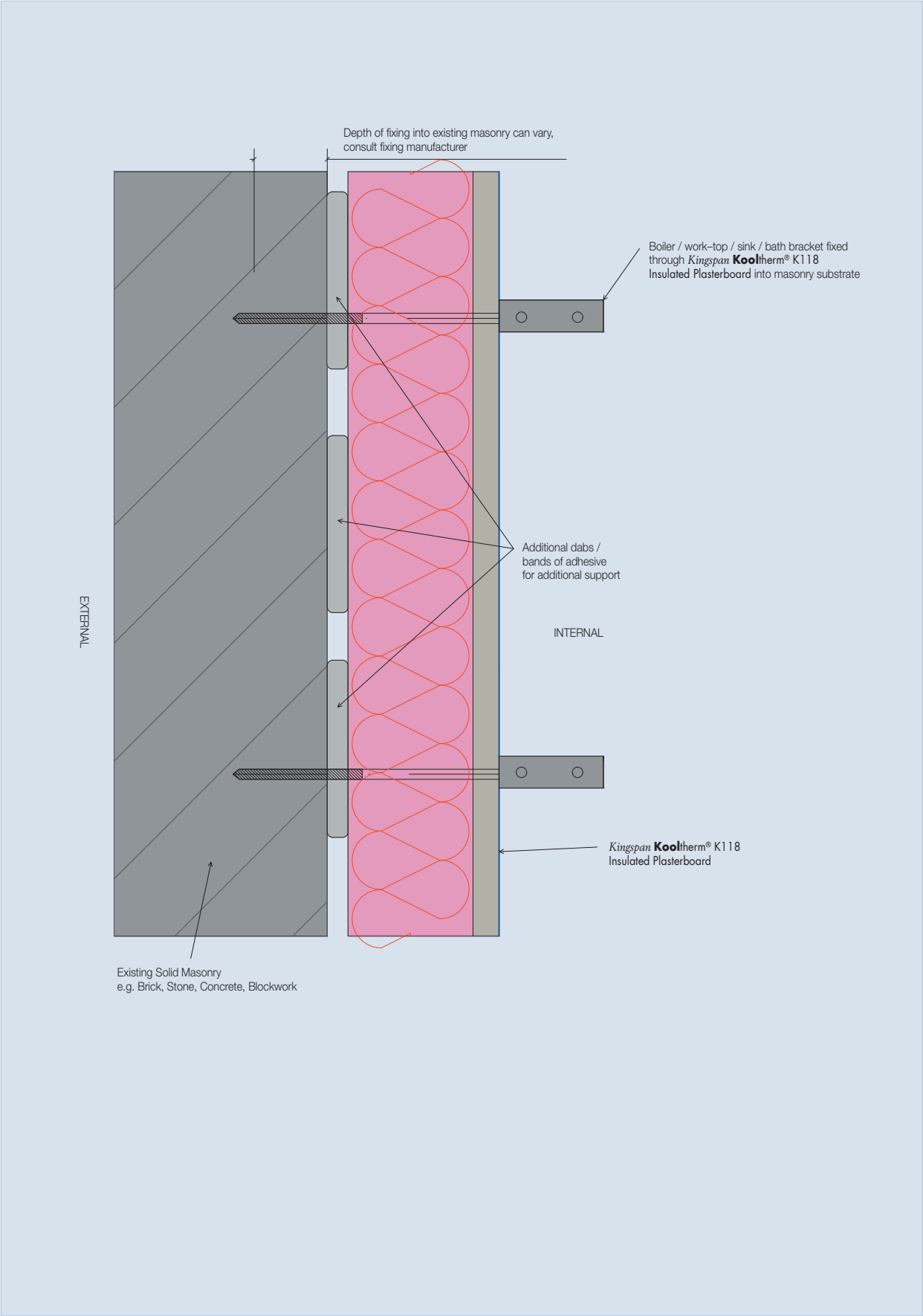


Figure 23: Heavy Surface Mounted Fittings Detail (Adhered)

Thermal Performance and Airtightness



Definitions

Air leakage

Air leakage is defined as the flow of air through gaps and cracks in the building fabric. Uncontrolled air leakage increases the amount of heat loss as warm air is displaced through the envelope by colder air from outside. Air leakage of warm damp air through the building fabric can also lead to condensation within the fabric ('interstitial condensation') which reduces insulation performance and can also cause fabric deterioration.

U-Value

Thermal performance of a plane building element e.g. wall, floor or roof is described by its U-value (Wm^2K). It is a measure of the heat transmission through the element per degree of temperature difference between the external and internal environments. The lower the U-value figure means the lower the heat loss through that element.

Thermal Bridging

Thermal bridging (or 'linear thermal transmittance') typically occurs at the junctions between the plane building elements e.g. wall-floor and wall-ceiling junctions or around openings where the main insulation layer covering the plane building element is interrupted. Thermal bridging increases heat loss and the risk of surface condensation due to the lower localised internal surface temperatures, potentially leading to surface condensation and mould growth. Therefore the building fabric should be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements, at the joints between elements, and at edges of elements such as those around windows and door openings.

The guidance below should be followed when minimising thermal bridging, surface condensation and airtightness in conjunction with **Kingspan Kooltherm® K118 Insulated Plasterboard**.

- At external angles, run the **Kingspan Kooltherm® K118 Insulated Plasterboard** past the corner and cut back the insulated backing of **Kingspan Kooltherm® K118 Insulated Plasterboard** to form a neat insulated junction.
- Do not allow **Kingspan Kooltherm® K118 Insulated Plasterboard** to block new or existing vents.
- Where a door opening occurs, **Kingspan Kooltherm® K118 Insulated Plasterboard** should be cut around the opening to avoid a joint directly in line with the door jambs.
- Best practice is to repeat the same procedure as detailed above for window openings where practical.
- Window or door reveals should be insulated with a thickness of 20 mm (min.) insulation, such as 32.5 mm **Kingspan Kooltherm® K118 Insulated Plasterboard**, this limits localised thermal bridging and a risk of mould growth.
- The junction of an external wall, party wall or internal wall should be insulated with a thickness of 20 mm (min.) insulation, such as 32.5 mm **Kingspan Kooltherm® K118 Insulated Plasterboard**, for a distance of 400 mm (min.) from the external wall lining.
- If the party wall or internal wall is not of solid masonry construction, insulation can be installed within the cavity of a cavity wall construction or installed within the frame of timber or metal studs.
- Where properties on both sides of a shared party wall are to be insulated, in order to reduce heat losses, best practise would recommend installing the insulation at least 400 mm along the party wall from the external wall.

NB When insulating just one side of a floor or wall (where the other side is uninsulated), the thermal heat losses on the uninsulated surface can increase, thus reducing the temperature to the uninsulated surface and increasing the risk of condensation and mould growth.

Where the above is applicable in the case of party walls, it is recommended that you refrain from insulating 400 mm along the party wall from the external wall.

- The application of internal insulation above and below an intermediate floor reduces the overall heat loss, however it can increase the losses through the intermediate or separating floor. To reduce these losses, where possible, the edge of the intermediate floor within the floor void should also be insulated.
- To ensure the intended thermal performance and airtightness of the construction is achieved, it is important to ensure all gaps around the perimeter of the board, where the **Kingspan Kooltherm® K118 Insulated Plasterboard** meets the ceiling, floor, adjacent walls, window / door frames and service penetrations, are sealed. Large gaps ($\geq 10mm$) should be filled with a combination of low expanding PU foam and flexible acrylic sealant and / or gypsum jointing compound. Small gaps ($\leq 10mm$) can be sealed in the same manner or alternatively filled with flexible acrylic sealant and / or gypsum jointing compound.



At reveals / external angles remember to run the lining past the corner and cut back the insulating backing of the **Kingspan Kooltherm® K118 Insulated Plasterboard to form a neat junction with the **Kingspan Kooltherm® K118 Insulated Plasterboard** on the adjacent wall / reveal jamb / external corner.**

Thermal Performance and Airtightness

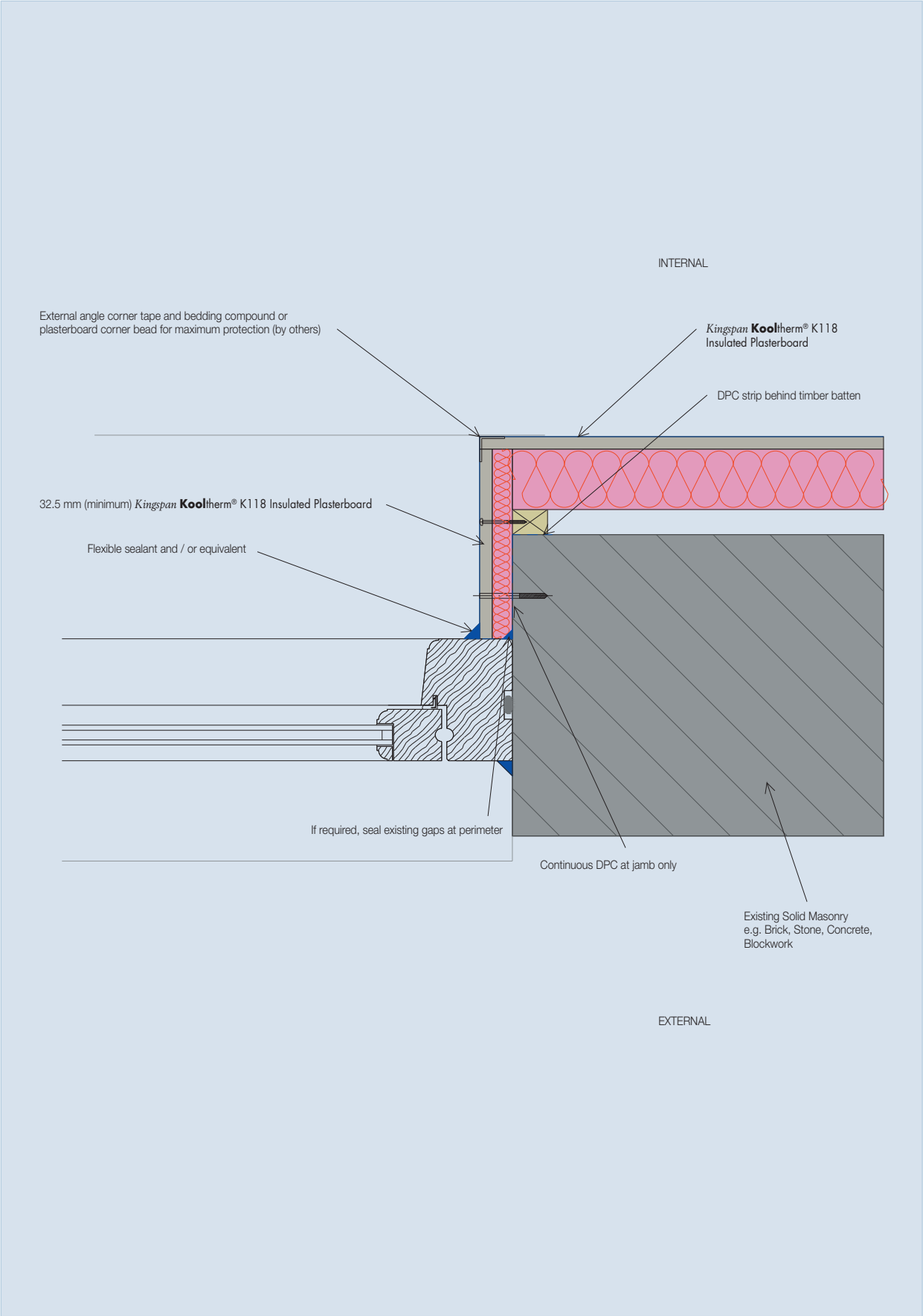


Figure 24: Recessed Window Jamb Detail (Mechanically Fixed)

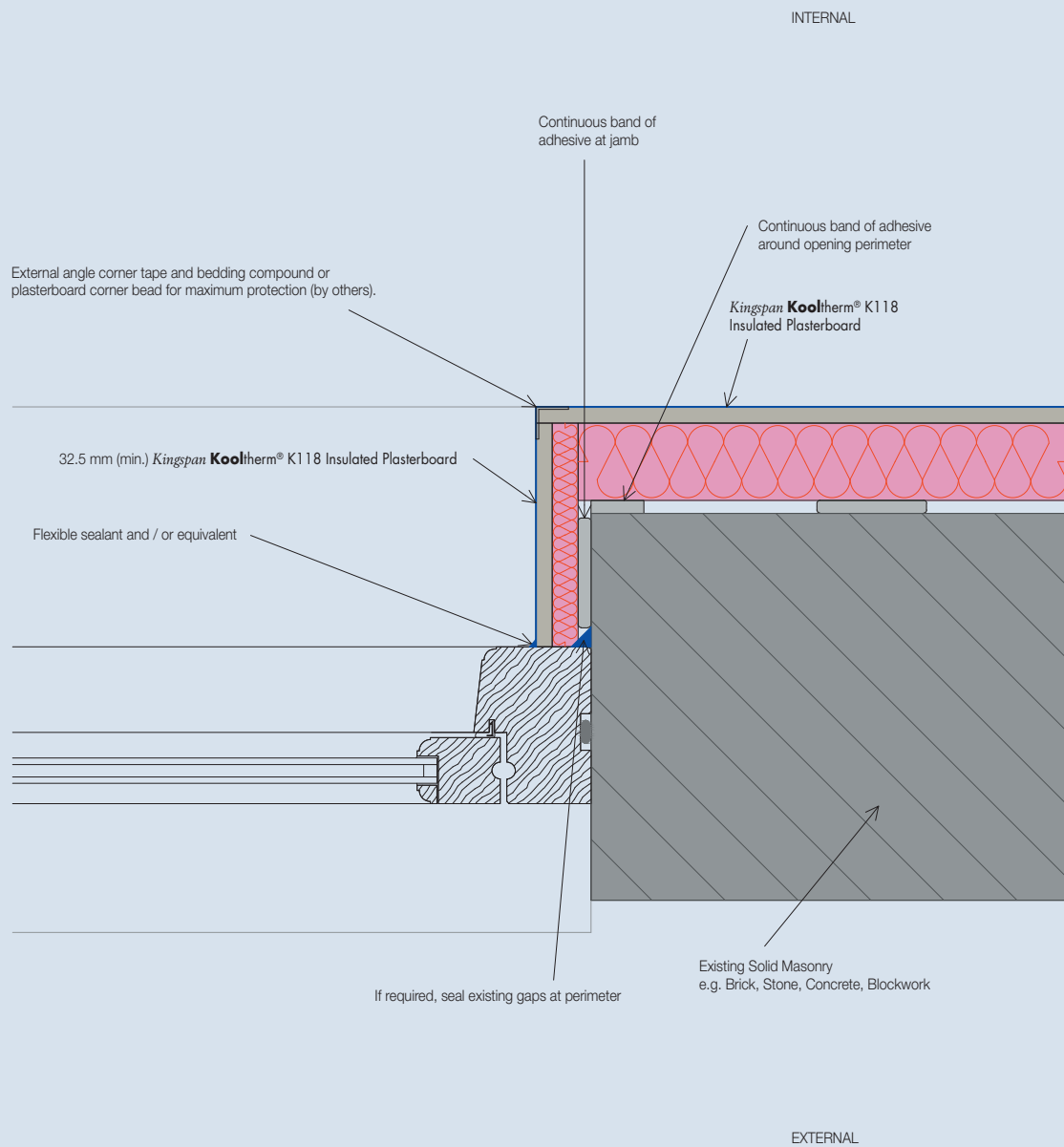


Figure 25: Recessed Window Jamb Detail (Adhered)

Thermal Performance and Airtightness

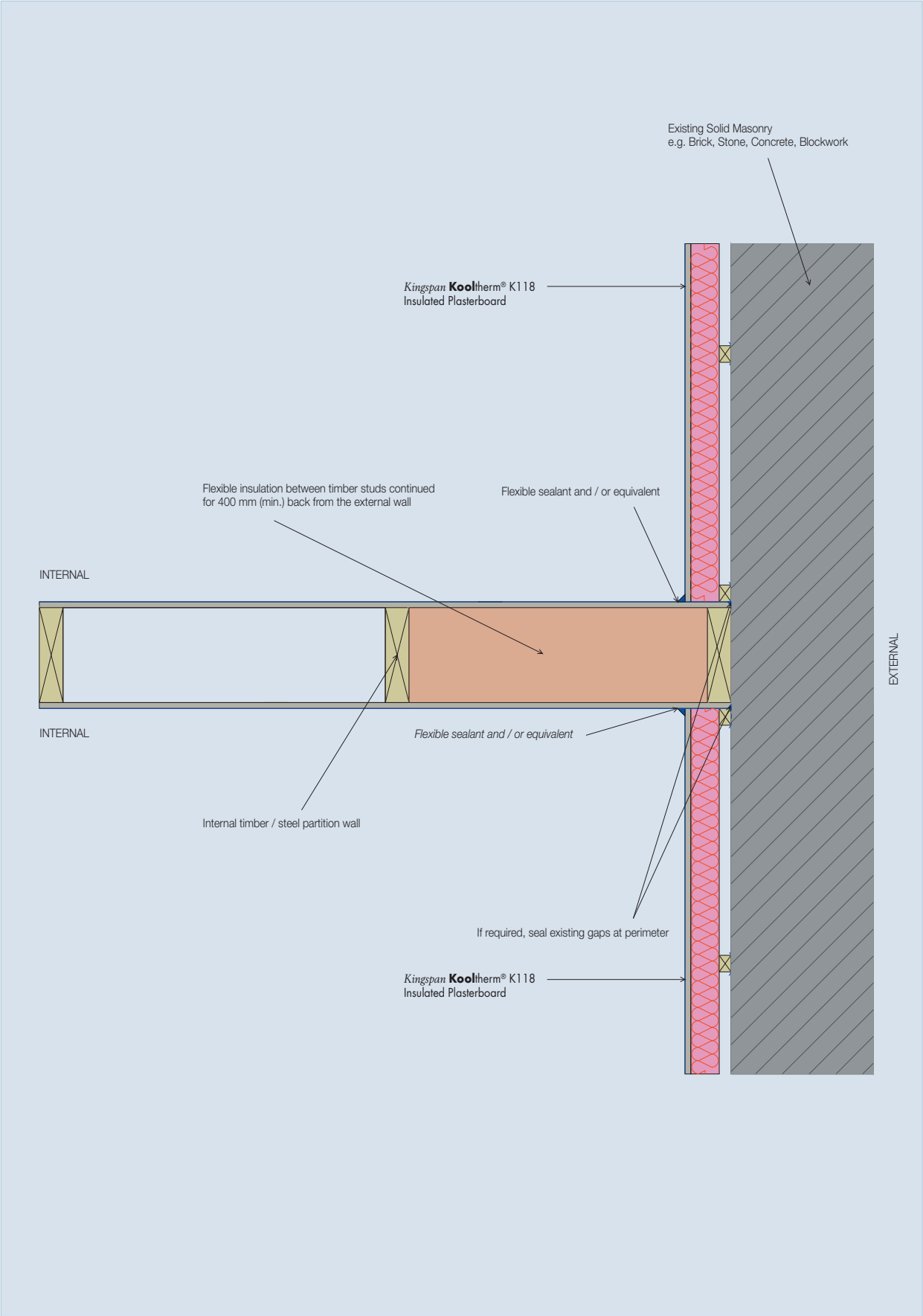


Figure 26: Internal Wall Junction Detail (Mechanically Fixed)

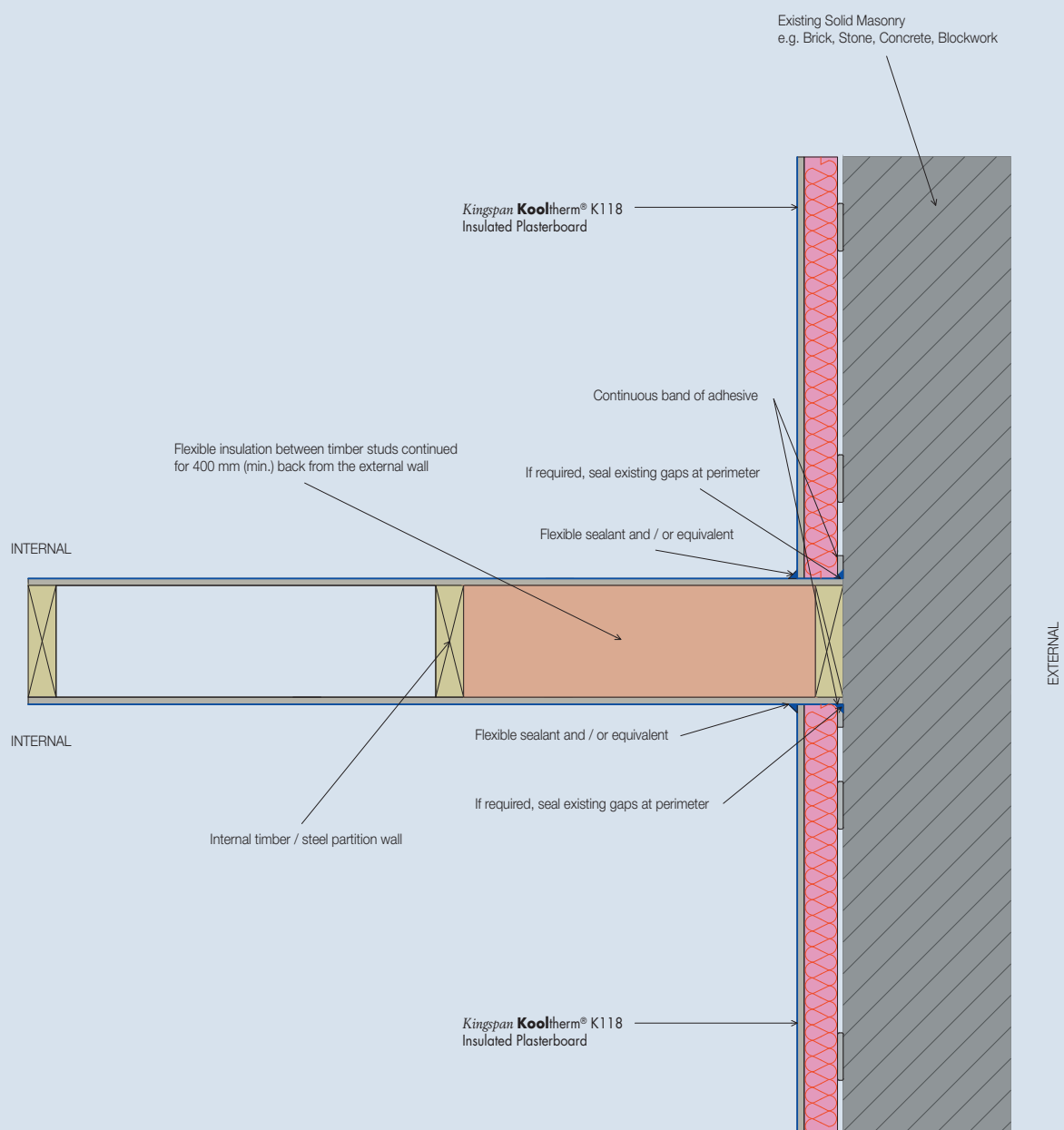


Figure 27: Internal Wall Junction Detail (Adhered)

Thermal Performance and Airtightness

Cavity Barriers

- When using a timber framework, a cavity barrier can be achieved by applying 47 mm wide x cavity dimension timber battens.
- When using a metal framing system, a cavity barrier can be achieved by applying 0.5 mm thick steel to close the cavity. Alternatively a cavity barrier can be achieved by using a 12 mm thick calcium silicate, 12 mm cement based or 12 mm gypsum based board cut to the cavity depth and screw fixed to the leg of the metal framing channel at the correct intervals.
- When using the gypsum based drywall adhesive dot and dab solution, a cavity barrier can be achieved by applying a continuous band of gypsum adhesive no less than 25 mm wide and of sufficient thickness (12 mm thick (min.)), to provide continuous contact when *Kingspan Kooltherm® K118 Insulated Plasterboard* is fixed.

Movement / Control Joints

- Consideration should be given to the provision for movement in the system via movement / control joints at 10 m intervals in long continuous runs of the wall.
- Movement / control joints should be incorporated to coincide or relate to existing movement joints in structural elements with no direct bridging of mechanical parts of the system.

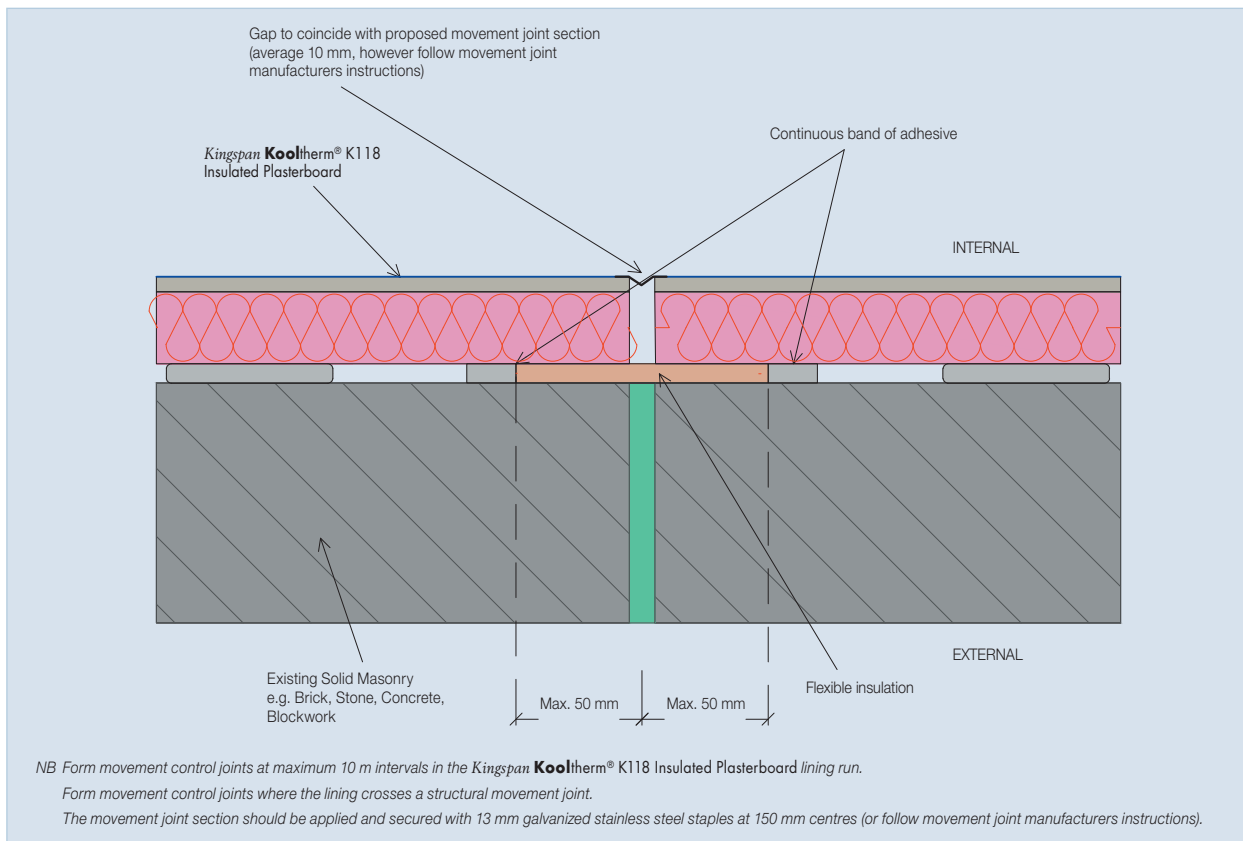


Figure 28: Expansion Joint Detail (Adhered)

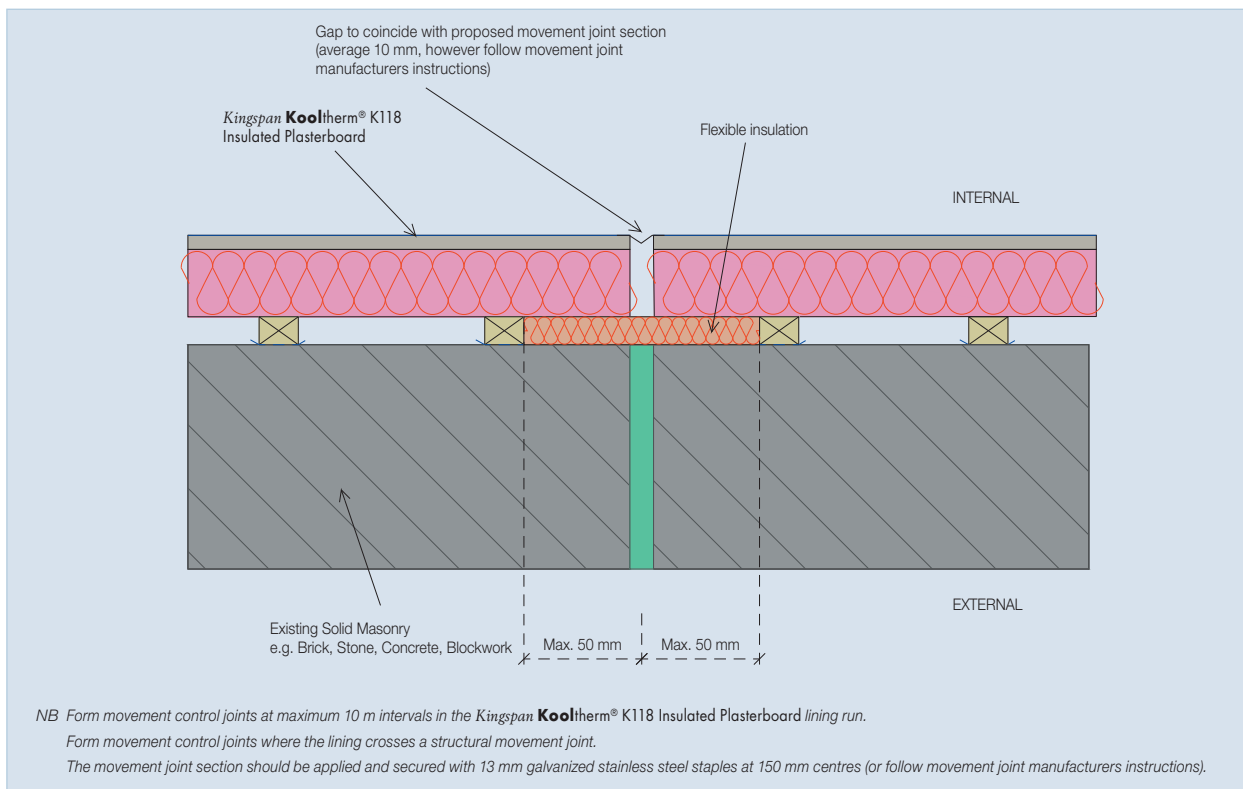


Figure 29: Expansion Joint Detail (Mechanically Fixed)

Dealing with Services

Services which will inevitably penetrate *Kingspan Kooltherm*® K118 Insulated Plasterboard e.g. recessed light switches, recessed socket boxes, water or fuel feed pipes and power outlets, should be kept to a minimum to limit damage to the insulation layer and vapour control.

Pipes, cables and conduits that are designed to be placed behind insulated dry-linings must be protected from mechanical damage and corrosion if contained within a solid masonry wall.

Some services e.g. pipework, electrics, etc. can be relocated onto the surface of *Kingspan Kooltherm*® K118 Insulated Plasterboard however they would be visible unless encased.

Flues and Combustion Appliances

The distance between Euroclass B – E rated materials, flues, chimneys and combustion appliances needs to be designed appropriately to prevent risk of ignition of vulnerable components. Distances will vary depending upon type of flue, appliance and fuel.

When undertaking the property survey determine the fuel type of any combustion appliances, its maximum power output ratings, and the specification for the associated flue.



A detailed design should be produced following the recommendations of Approved Document J in England and Wales or Section 3.17 – 3.24 of the Scottish Technical Standards, and any applicable additional guidance from the flue / combustion appliance manufacturer following the property survey.

The project specific specification should include a minimum distance, if required, between the flue / combustion appliance / chimney and *Kingspan Kooltherm*® K118 Insulated Plasterboard in addition to any Euroclass B rated (or below) supports and as well as that required for any thermally conductive (e.g. metal) fixings in connection with these items.

Areas of wall less than the required distance from the flue / combustion appliance / chimney, which require separation from Euroclass B – E rated materials and require thermal insulation to maintain continuity should utilise Euroclass A1 rated insulation in the localised zone.

Similarly, if pre-treated timber battens are used as the supporting framework, then timbers should be replaced within these zones with a metal framing system, set to the required separation distance.

The required separation distance between *Kingspan Kooltherm*® K118 Insulated Plasterboard and flue / chimney breasts / heating appliance will vary. Guidance should be sought from the component manufacturer.

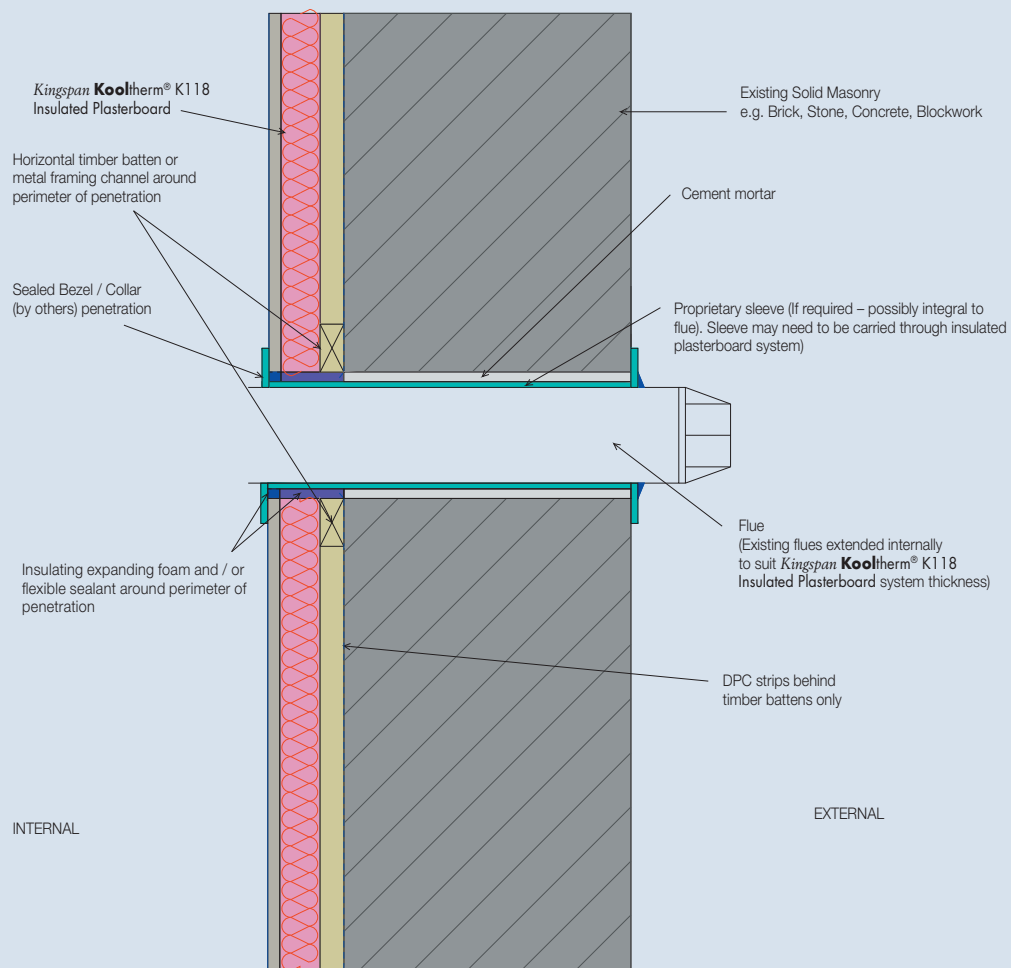
Separation between the heating appliance and / or flue may not be required in some cases, for example where the fluepipes are supplied by or specified by the appliance manufacturer as being suitable for purpose without separation from Euroclass B – E rated materials.

For low temperature appliances where small separation distances are required, e.g. typically up to 30 mm, this may be achieved by overlaying the face of *Kingspan Kooltherm*® K118 Insulated Plasterboard with an appropriate thickness of Euroclass A1 rated building board prior to installation of the appliance. Refer to the appliance manufacturer for guidance.



It is extremely important that ventilation requirements for certain combustion appliances are not compromised when installing internal wall insulation.

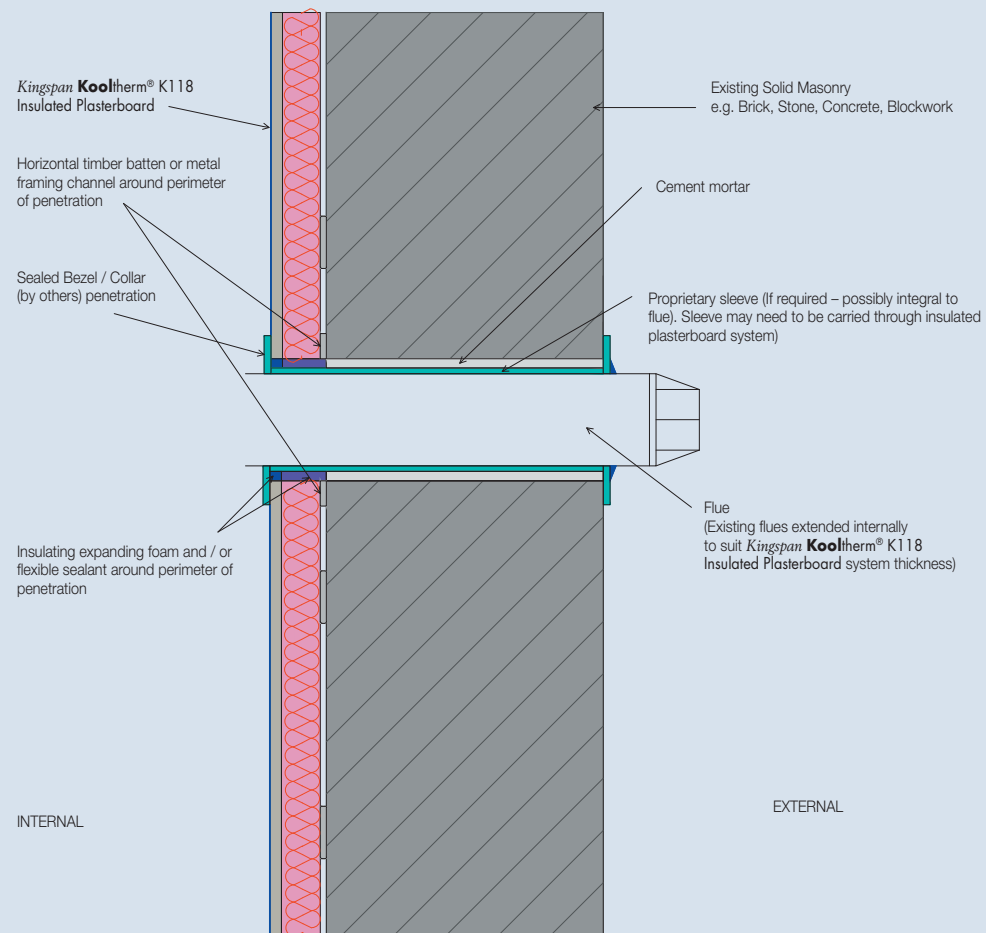
Some modern heating systems, for example room-sealed appliances, may not require additional ventilation openings to the external air (unless where cooling air is needed) therefore minimising ventilation energy losses from the room and the risk of cold draughts.



- ***This detail may be used where a separation between the flue / air duct and Euroclass B – E rated material is not required, for example plastic flues serving appliances that operate under 100°C.***
- ***Always refer to the manufacturer of the heating system and obtain guidance from a competent person (Gas safe, OFTEC, HETAS or equivalent) to determine the requirements.***
- ***Manufacturer's instructions may detail a specific clearance from the flue / air supply duct (s) and Euroclass B – E rated materials, irrespective of flue-gas or duct temperature.***

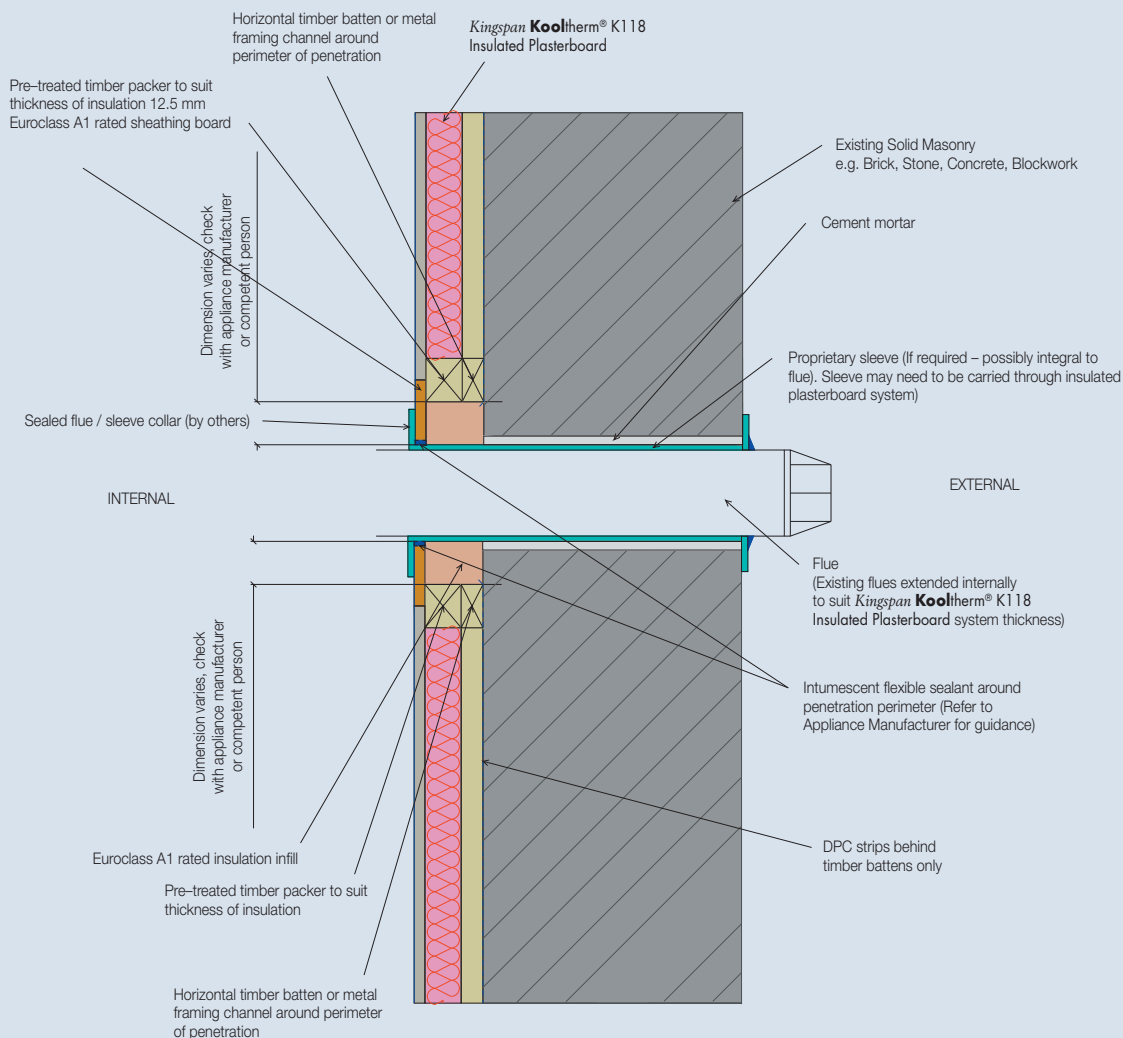
Figure 30: Flue Detail A – No Separation from Flue (Mechanically Fixed)

Dealing with Services



- ***This detail may be used where a separation between the flue / air duct and Euroclass B – E rated material is not required, for example plastic flues serving appliances that operate under 100°C.***
- ***Always refer to the manufacturer of the heating system and obtain guidance from a competent person (Gas safe, OFTEC, HETAS or equivalent) to determine the requirements.***
- ***Manufacturer's instructions may detail a specific clearance from the flue / air supply duct (s) and Euroclass B – E rated materials, irrespective of flue-gas or duct temperature.***

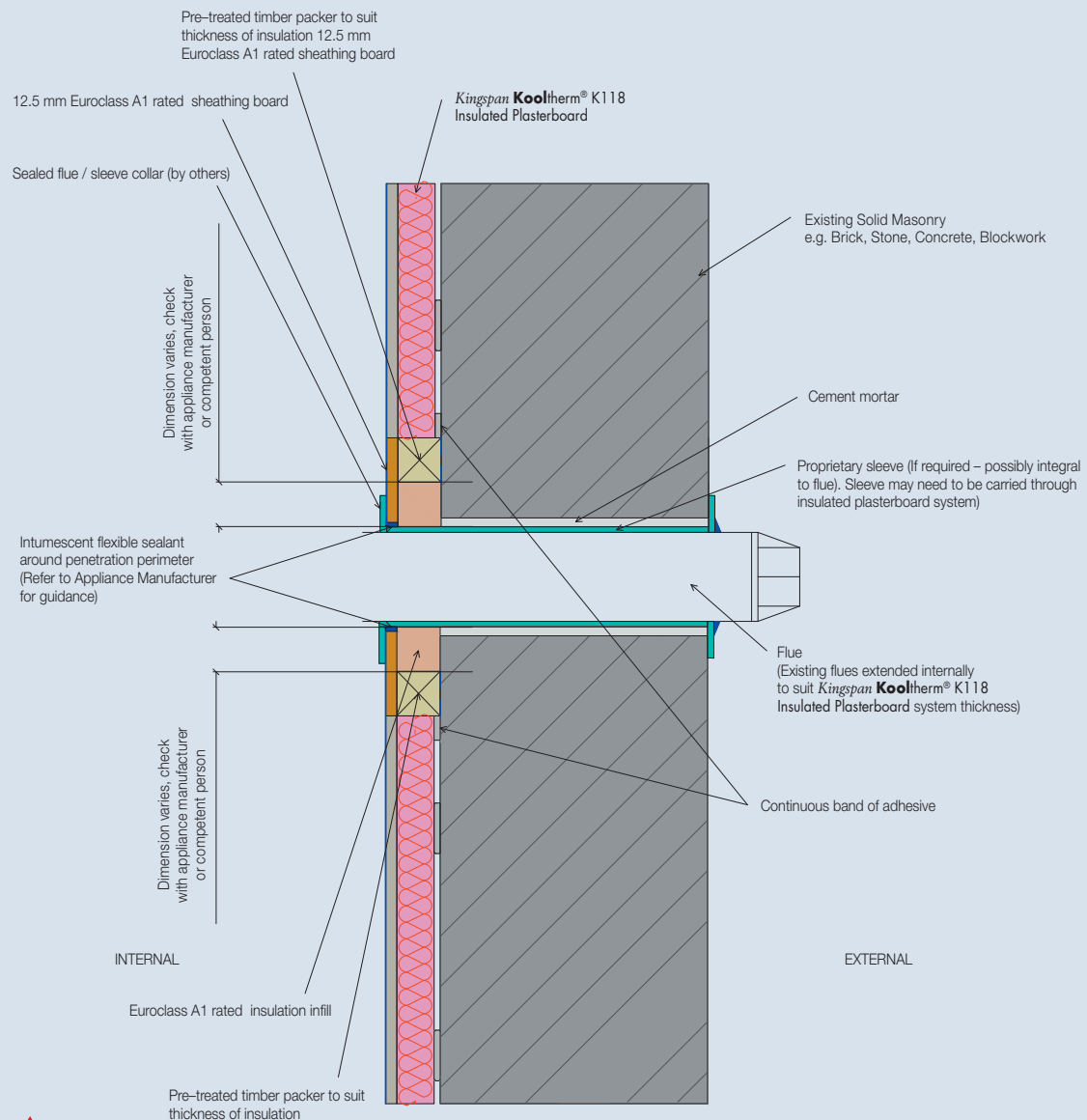
Figure 31: Flue Detail A – No Separation from Flue (Adhered)



- ***This detail illustrates when separation from the flue / air duct and Euroclass B – E rated material is required.***
- ***The appliance manufacturer's instructions must be sought, which may detail a specific clearance from the flue / air supply duct (s) and Euroclass B – E rated materials, irrespective of flue-gas or duct temperature.***
- ***The dimension of Euroclass A1 rated insulation around flue pipes / terminal can vary, for example, all flues serving oil fired boilers require a 300 mm (min.) area around the flue pipe / terminal, free from Euroclass B – E rated material.***
- ***Always refer to the manufacturer of the heating system and obtain guidance from a competent person (Gas safe, OFTEC, HETAS or equivalent) to determine the requirements.***

Figure 32: Flue Detail B – Separation from Flue required (Mechically Fixed)

Dealing with Services



- ***This detail illustrates when separation from the flue / air duct and Euroclass B – E rated material is required.***
- ***The appliance manufacturer's instructions must be sought, which may detail a specific clearance from the flue / air supply duct (s) and Euroclass B – E rated materials, irrespective of flue–gas or duct temperature.***
- ***The dimension of Euroclass A1 rated insulation around flue pipes / terminal can vary, for example, all flues serving oil fired boilers require a 300 mm (min.) area around the flue pipe / terminal, free from Euroclass B – E rated material.***
- ***Always refer to the manufacturer of the heating system and obtain guidance from a competent person (Gas safe, OFTEC, HETAS or equivalent) to determine the requirements.***

Figure 33: Flue Detail B – Separation from Flue required (Adhered)

Pipework

- All ductwork or service pipework, (e.g. central heating pipework or ductwork) designed to go behind the insulated drylining on the cold side of the main insulation layer, should be insulated and then protected from mechanical damage.
- Where the design details gas or oil pipework to be installed behind the insulated dry lining then the gas or oil pipework should be protected from corrosion (if contained within a solid masonry wall) and mechanical damage. The pipework must also be suitably encased by building material, this can be achieved by encasing the pipe with timber battens or drywall adhesive i.e. continuous timber battens or continuous bands of adhesive fixed either side of the pipe to encase it. This should then be protected via a steel cover.
- For further guidance on the installation of gas or oil pipework for domestic applications refer to BS 6891: 2005 + A2: 2008 (Installation of low pressure gas pipework of up to 35 mm in domestic premises) or BS 5410 (Code of practice for oil firing).
- Requirements for installation of gas or oil pipework in other building types i.e. non domestic buildings should be agreed with the gas or oil supplier.

Pipework

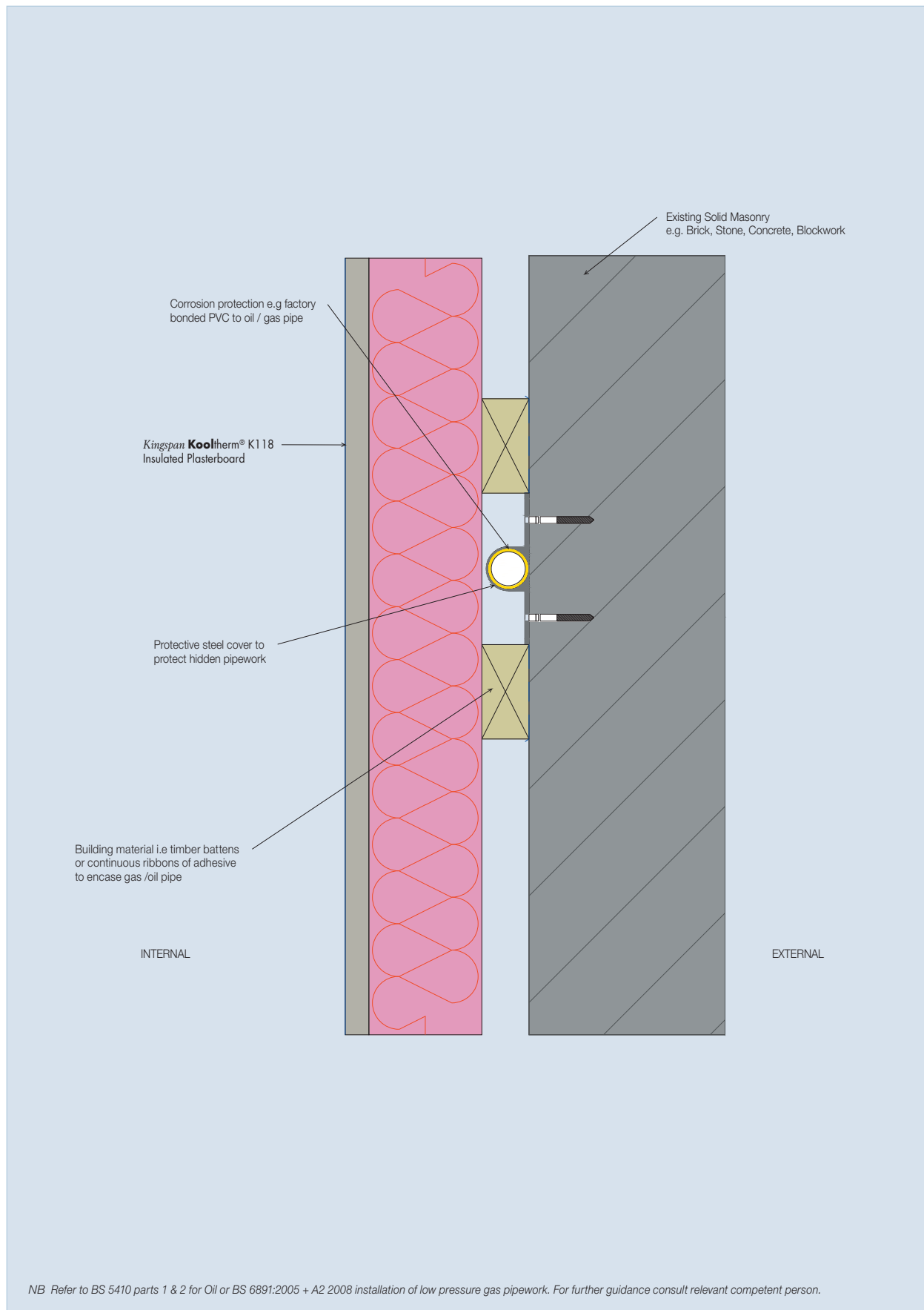


Figure 34: Vertical Gas or Oil Pipe behind Dry Lining Detail (Mechanically Fixed)

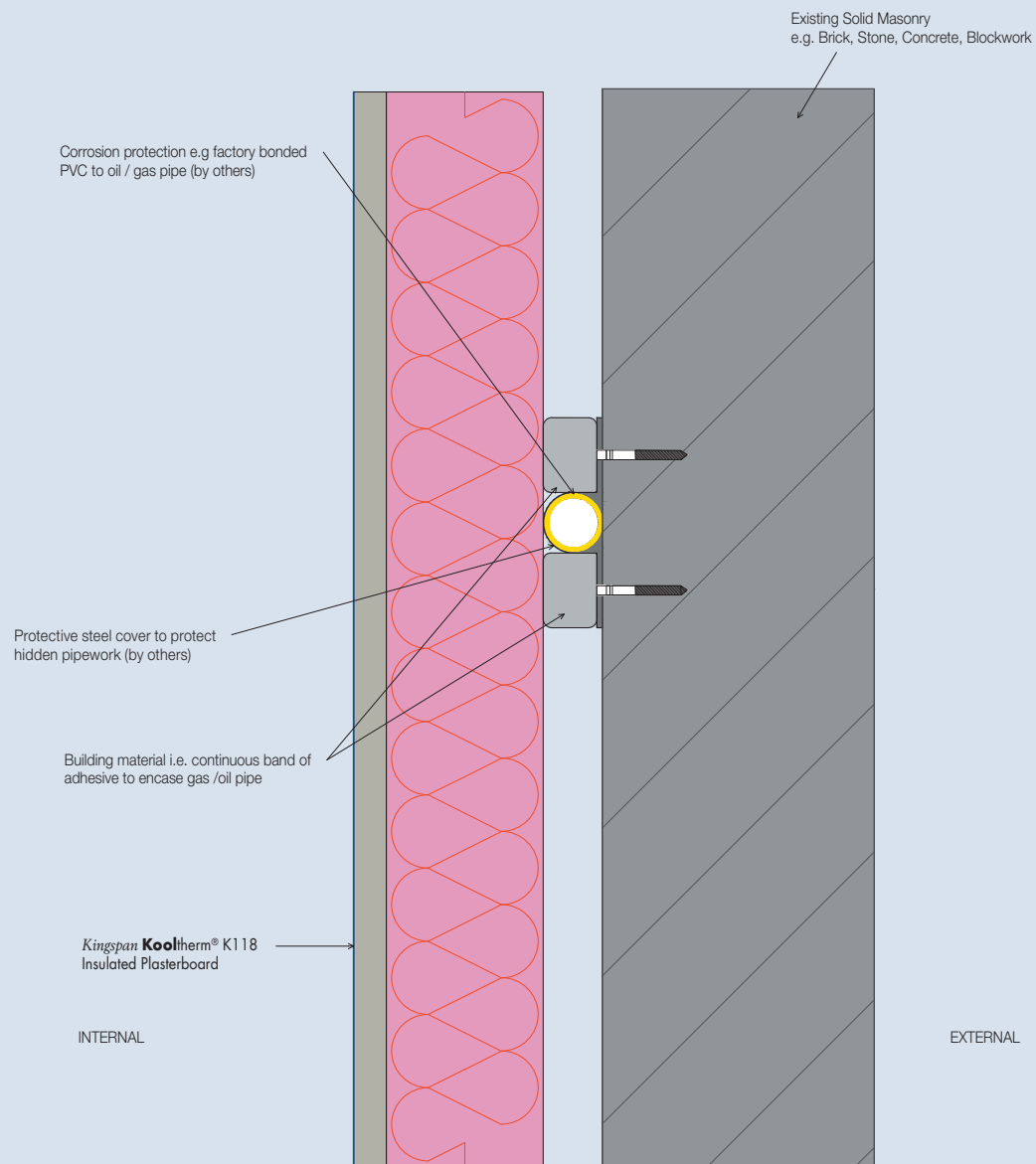


Figure 35: Vertical Gas or Oil Pipe behind Dry Lining Detail (Adhered)

Pipework

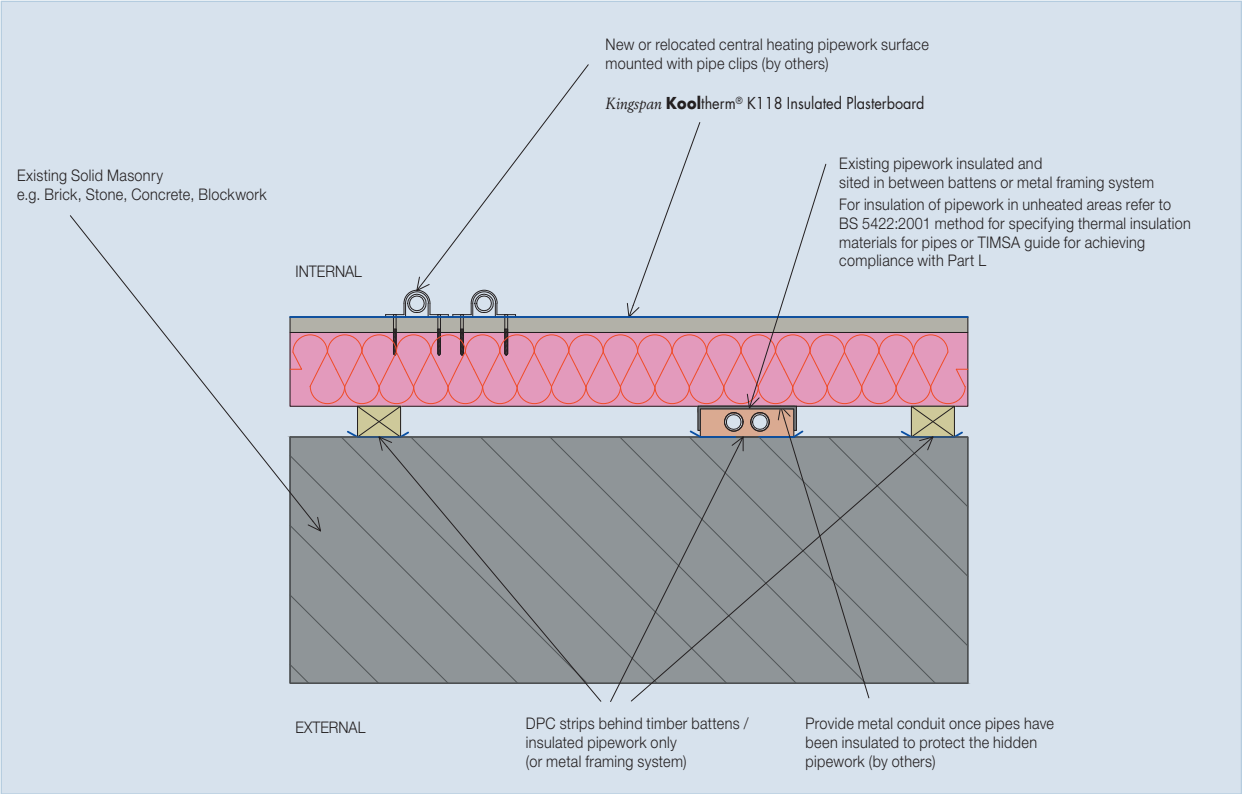


Figure 36: Central Heating Pipework on the Surface of Kingspan **Kooltherm®** K118 Insulated Plasterboard (Mechanically Fixed)

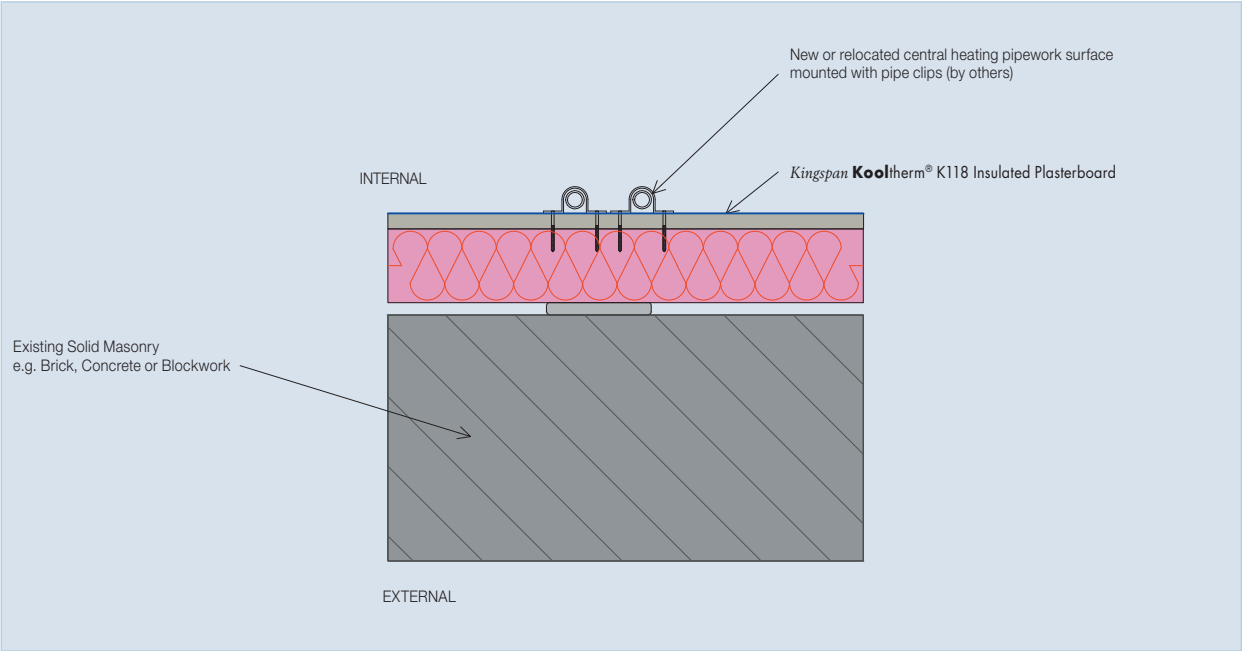


Figure 37: Central Heating Pipework Behind or on the Surface of Kingspan **Kooltherm®** K118 Insulated Plasterboard (Adhered)

Electrical Services



All electrical work in dwellings should be designed and installed in accordance with BS 7671: 2008 + A3: 2015 (Requirements for electrical installations, IEE Wiring regulations), or an equivalent standard approved by a member of the EEA. When retrofitting an existing building an inspection of the existing electrical installation at the property should be carried out by a competent person to determine when the electrical installation was last upgraded, this will provide an insight as to the extent of any remedial electrical works needed prior to the installation of the Internal Wall Insulation and any other fabric retrofit measures.

- Electrical cables that are likely to come into contact with the insulation component of **Kingspan Kooltherm® K118 Insulated Plasterboard** are not required to be protected by a suitable conduit to prevent plasticiser migration as would be the case with some other forms of insulation i.e. polystyrene insulation which can cause the PVC sheathing to age prematurely, however conduit may be required for other reasons, see below.
- Electrical cables surrounded by, or adjacent to insulation increases the risk of their overheating and cables may need to be de-rated / placed in conduit to compensate no matter what the type of insulation material. In order to avoid mechanical damage, use metal conduit if the cable is within 50 mm of the plasterboard component lining.
- The circuits most likely to be affected are radial circuits serving cookers, immersion heaters, shower units, high output heaters and socket outlets.
- Cables fully enclosed by insulation may need to be increased in size above the standard recommended size by as much as 20 % if they pass at right angles through an insulating layer, and as much as 50 % if they are enclosed along their length for more than 500 mm. For cables enclosed by insulation, but in contact with a thermally conductive surface on one side, the larger of the standard recommended sizes will generally need to be used.
- Where it is possible to use the existing electrical cables, then cables being retained / reused, as opposed to rewiring, may need to be placed in conduit / de-rated to safely carry the load after the internal wall insulation installation.
- Existing electrical cables that are being retained / reused may need to be extended as a result of the new internal wall insulation system, alternatively relocate the sockets or switches (if possible) higher than the original position therefore freeing up the necessary amount of cabling required.
- Recessed dry lining socket boxes can produce a thermal bridge through the insulated dry-lining and if not detailed correctly, can cause additional heat losses.
- Preferably recessed fittings such as dry-lining socket boxes should be relocated to an internal wall, alternatively, use surface mounted fittings. Should recessed dry-lining socket boxes be desired then these should be backed by a sufficient level of insulation where **Kingspan Kooltherm® K118 Insulated Plasterboard** has been cut to fit the dry-lining socket box, this will then reduce thermal bridging and additional heat losses.
- Flexible insulation can be placed between the framework or adhesive dab cavity prior to fitting **Kingspan Kooltherm® K118 Insulated Plasterboard** where recessed dry-lining socket boxes are to be located.
- If placing dry-lining socket boxes into **Kingspan Kooltherm® K118 Insulated Plasterboard** then cut with a pad saw to make space for the socket box, cut the hole as close to the size of the socket box as possible, then seal the perimeter of the socket box with **Kingspan Kooltherm® K118 Insulated Plasterboard** using a flexible sealant, this therefore compresses the sealant into firm contact with **Kingspan Kooltherm® K118 Insulated Plasterboard** to form a permanent airtight seal.
- In addition, seal where the cable comes into the back of the box to reduce leakage or seal around the perimeter of the cable if using surface mounted sockets or switches.
- Socket and switch boxes should be fixed into **Kingspan Kooltherm® K118 Insulated Plasterboard** in accordance with the manufacturer's instruction.
- Suitably qualified competent persons should be consulted / used when installing fixed electrical cables or fixed electrical equipment or fittings such as an electrical engineer, consultant or professional body.

Electrical Services

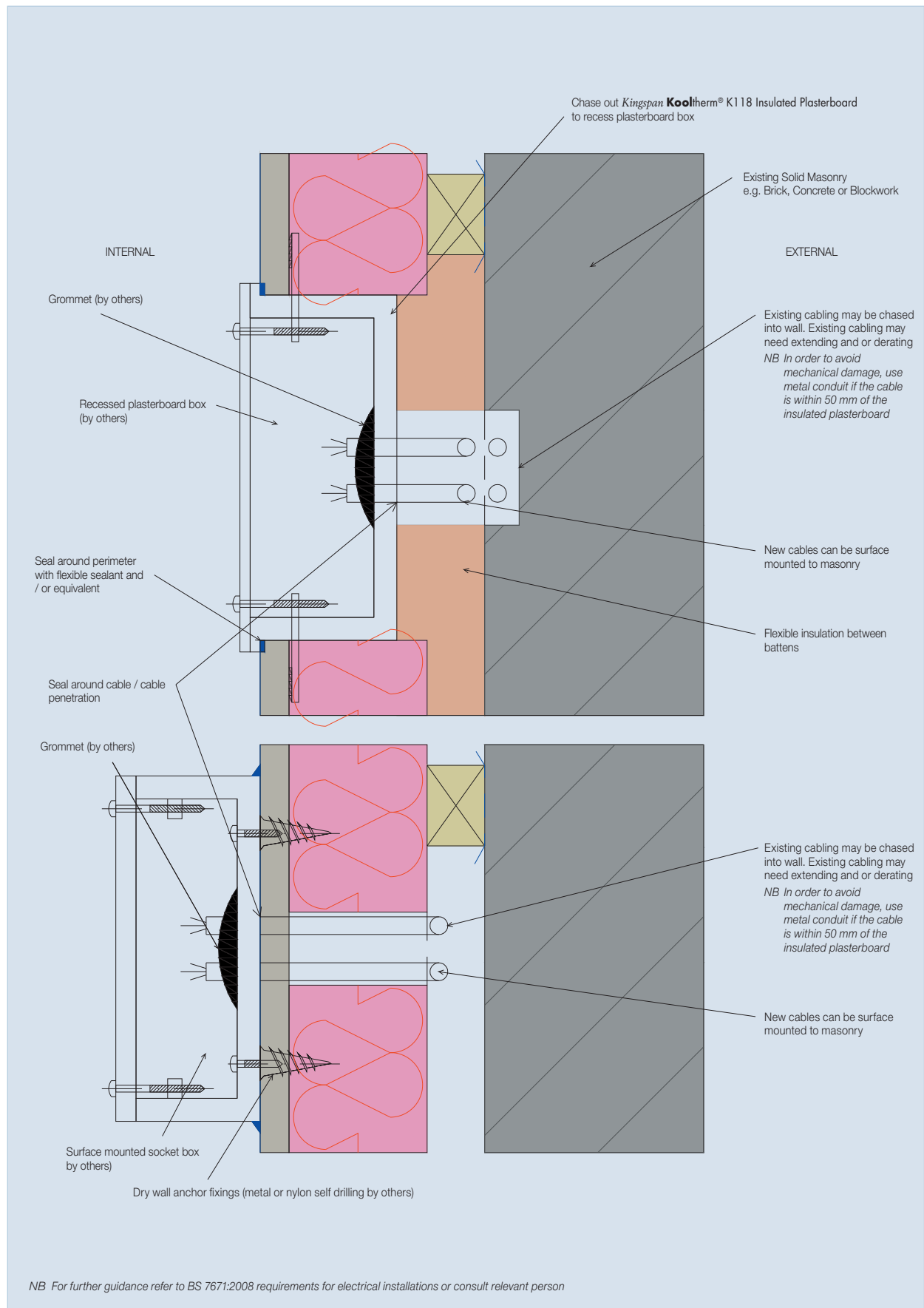
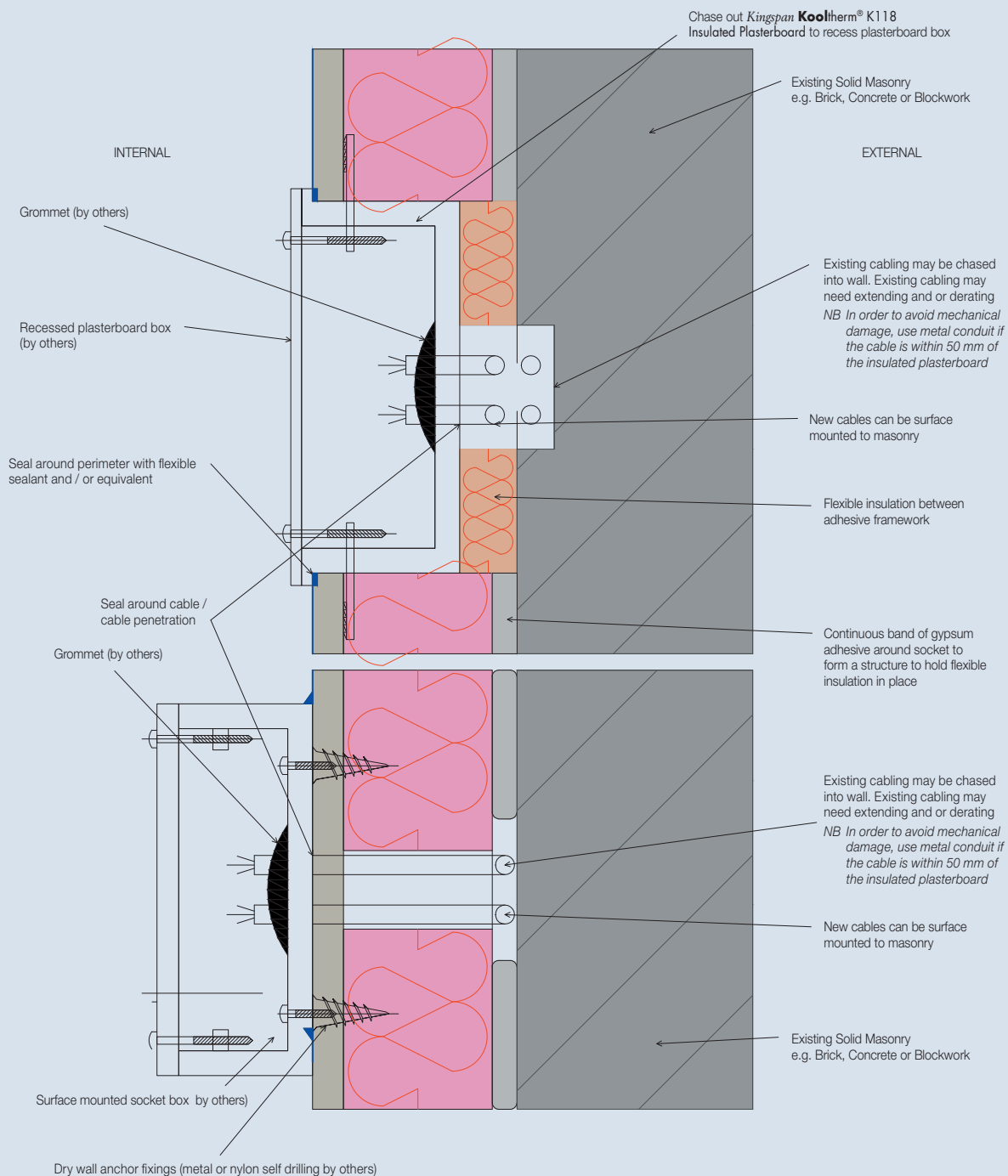


Figure 38: Recessed or Surface Mounted Socket Detail (Mechanically Fixed)



NB For further guidance refer to BS 7671:2008 requirements for electrical installations or consult relevant person

Figure 39: Recessed or Surface Mounted Socket Detail (Adhered)

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer-aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation Technical Service Department with your project specification. Calculations can be carried out to provide U-values, condensation / dew point risk, required insulation thicknesses etc...



Thereafter any number of permutations can be provided to help you achieve your desired targets.

The Kingspan Insulation Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

The Kingspan Insulation British Technical Service Department operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U-value and Condensation Risk Calculations.



Kingspan Insulation Ltd. reserves the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and reference should be made to the current Kingspan Insulation price-list or advice sought from Kingspan Insulation's Customer Service Department (see above left). The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified for suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a Technical Advisory Service (see above), the advice of which should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of this literature is current by contacting the Kingspan Insulation Marketing Department (see left).

