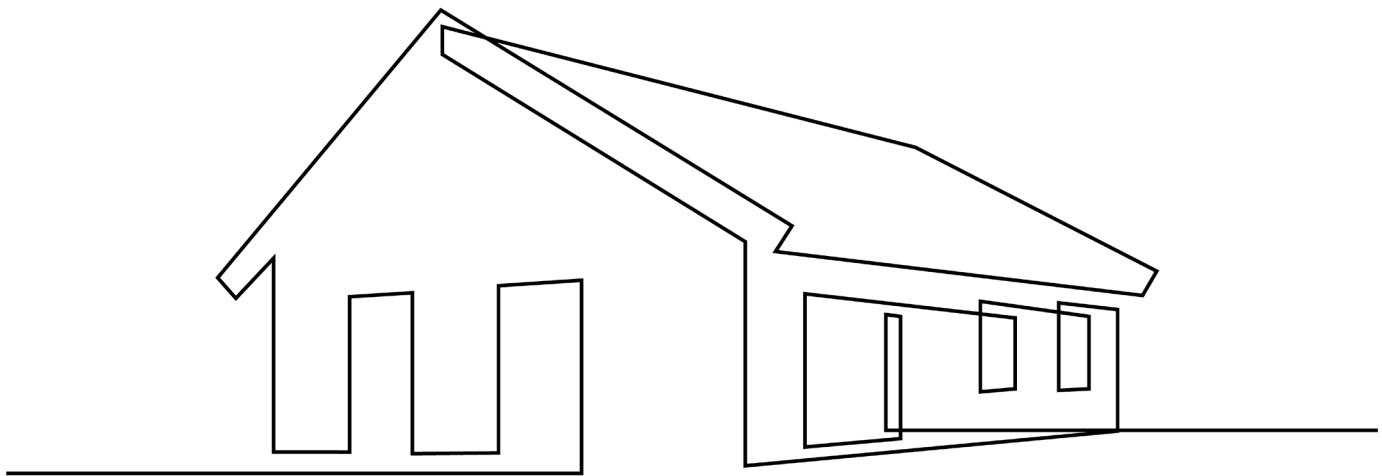


Insulation



Kooltherm[®] Residential

Insulation Solutions for New Builds and Renovations



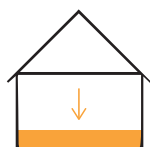
Index

About Kingspan Insulation 03

Technical & Customer Service 04

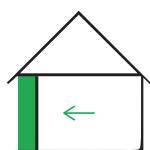
Product Solutions

Floor Insulation



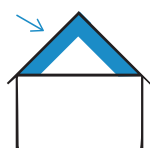
05

Wall Insulation



08

Roof Insulation



12



Kingspan Insulation is a market leading manufacturer of innovative ultra-thin flexible insulation products and super high performance rigid insulation products for building fabric and building services applications. Kingspan Insulation is committed to providing the world market with high quality, innovative products supported by technical expertise and customer service which is unsurpassed in the industry.

Kingspan Insulation has a vast product range including premium performance rigid Kooltherm® insulation; high performance rigid Therma™ insulation and flexible fibre-free reflective AIR-CELL® insulation. The extensive range of products is suitable for a variety of applications including:

- Pitched roofs
- Flat roofs
- Tapered roofing systems
- Cavity walls
- Solid walls
- Insulated dry lining
- Timber and steel framing
- Floors and
- Soffits



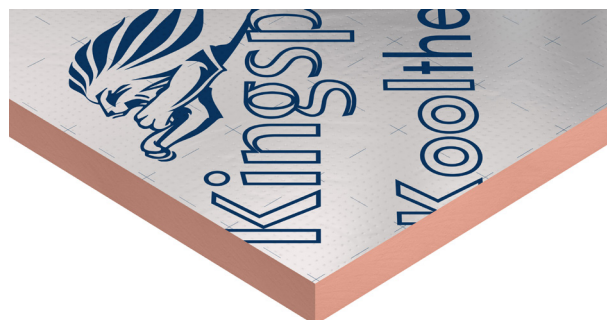
Premium Performance

Our premium Kooltherm® range is a great example of our knowledge and expertise combining to create a premium performance rigid phenolic insulation for roof, wall and floor.

With a thermal conductivity from as low as 0.021 W/m.K Kingspan Kooltherm® is the most thermally efficient insulation product commonly used. The closed cell structure resists both moisture and water vapour ingress and is unaffected by air infiltration - a problem which can be associated with open cell materials such as mineral fibre resulting in reduced thermal performance.

What is a rigid phenolic board?

A rigid board is a high performance rigid thermoset core sandwiched between composite facings.
(See Fig below)



Here are a few features of a Kooltherm® rigid insulation board:

1. CFC/HCFC-free with Zero Ozone Depletion Potential (ODP)
2. Ultra low conductivity = Highest R-value per mm
3. Fibre-free insulation core
4. Less smoke
5. Thermo-set

Kooltherm® Phenolic rigid insulation boards are suitable for:



Customer Service

We're ready to help. For any enquiries, please get in touch here:

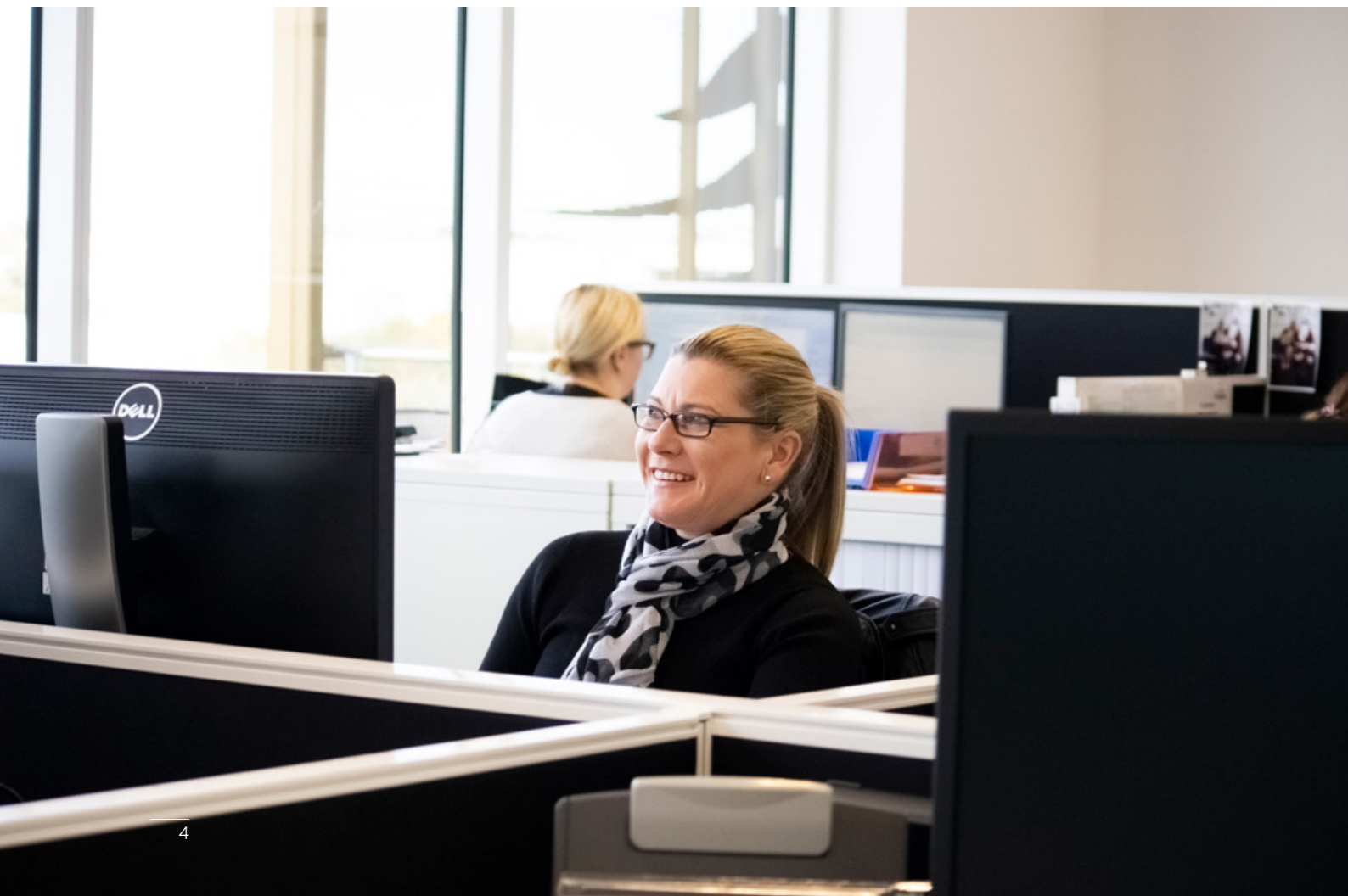
Kingspan Insulation Pty Ltd

T: 1300 247 235

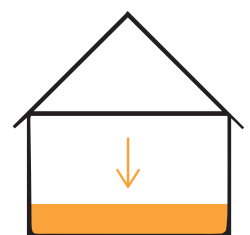
E: info@kingspaninsulation.com.au

www.kingspaninsulation.com.au

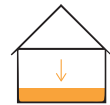
For Technical Enquiries please contact Kingspan Insulation Technical Services on 1300 247 235 or email technical@kingspaninsulation.com.au



Floor Applications



Solid Ground Floor



Insulation to required thickness is laid over the damp proof membrane ideally in a 'break bonded' (i.e. staggered) pattern. If using two layers of insulation the vertical joints can be staggered to ensure continuity of the insulation (i.e. no vertical joints lining up). The insulation should be overlaid with a separation membrane to ensure that wet screed cannot penetrate the joints of the insulation boards.

To reduce thermal transfer, insulation should be placed vertically along the entire perimeter of the external slab edge to ensure that the concrete slab is separated from the external soil/earth - this will create a robust detail and therefore prevent cold bridging.

Consideration should be given to the position of the insulation when there is in-slab heating & cooling systems. The insulation can either expose the system to the thermal mass of the concrete or isolate it. For a 24-hour, or long cycle heating systems, the thermal mass of the concrete slab will ensure a more even heating regime, therefore it might be beneficial locating the concrete slab over the insulation. For short intermittent heating cycles where a fast response time is required it may be more beneficial to have less thermal mass and therefore place the insulation directly below the screed. The designer or supplier of the heating/cooling system should be consulted prior to making a decision on the insulation location.

While the insulation is a 'closed cell' material and therefore does not readily absorb moisture it should not be allowed to get wet either in storage or application.

The vertical slab edge insulation should be the Kingspan GreenGuard, which is an XPS material and suitable for use in wet/damp applications.

Kingspan Kooltherm® K3 Floorboard Product R-value	
Kooltherm® K3 Thickness	R-Value (m²K/W)
25 mm	R1.10
50 mm	R2.30

Kingspan GreenGuard® Product R-value	
Kingspan GreenGuard® GG300 & GreenGuard® GG500 Thickness	R-Value (m²K/W)
30 mm	R0.75
50 mm	R1.25

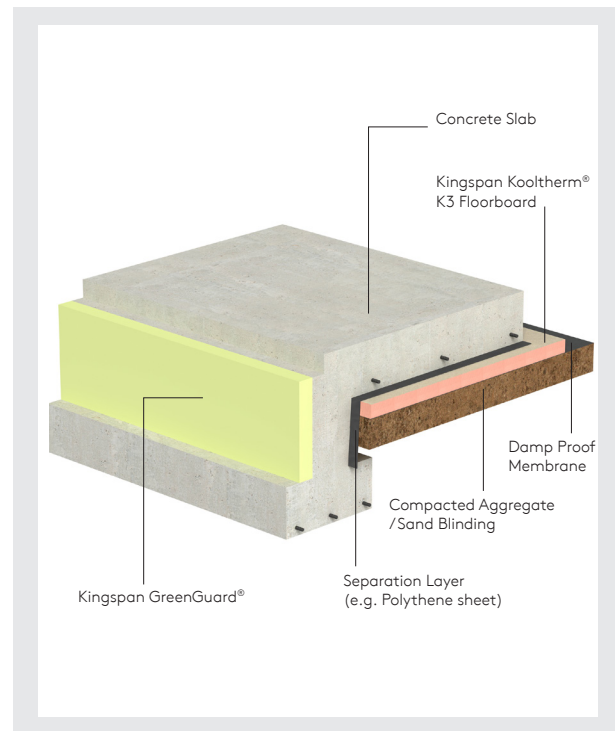


Figure 1

The Kingspan Insulation GreenGuard is CFC/HCFC free and manufactured using a CO₂ blowing agent.

Do

Ensure boards are protected during installation from wheeled/ foot traffic by using scaffold planks or other protective measures.

Don't

Do not place under any direct point loads or foundations including slab thickening.

Suspended Timber Ground Floor



Insulation to required thickness can be placed in suspended floor construction both in a new construction or as a retrofit solution on existing properties.

Unlike Kooltherm®, mineral wool is not rigid, and it is therefore difficult to ensure complete fill of the void between floor joists in suspended timber floors, without special attention to detail in the installation of its support e.g. netting.

Fitting the insulation boards snugly between the floor joists will ensure optimum thermal performance can be achieved with minimal air leakage. Measure the distance between the joists accurately prior to cutting the boards as spacings can vary.

Side-nail 25 mm x 25 mm timber battens to the joists or partially drive galvanised nails into the side of the joists in the appropriate position to hold the boards in place.

Any narrow gaps between a joist and perimeter wall should be insulated by specially cut pieces of board which in turn should be supported on blocks nailed to the underside of the joists. Gaps less than 25 mm wide should be filled with expanding urethane foam sealant.

Kingspan Kooltherm® K3 Floorboard Product R-value	
Kooltherm® K3 Thickness	R-Value (m²K/W)
25 mm	R1.10
50 mm	R2.30

Do

Push the cut insulation boards between the joists so they are in contact with the underside of the floor boards.

Don't

Do not leave gaps or voids between the insulation boards, which would negatively impact the thermal efficiency of the system.

Kooltherm® K3 does not act as a food source for pests/vermin. Unlike mineral wool, it does not provide the nesting grounds for pests/vermin.

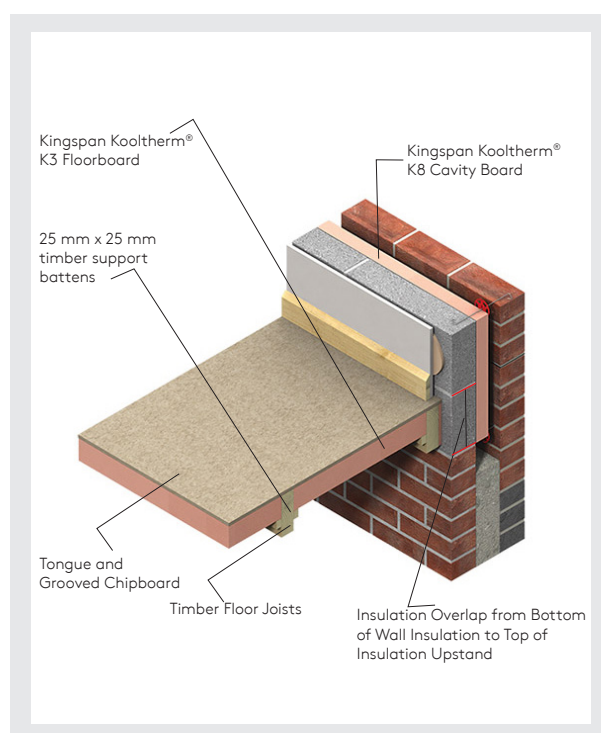
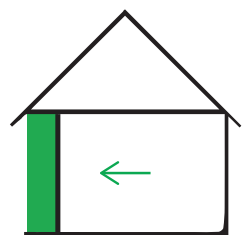
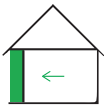


Figure 2

Wall Applications



Stud Framed Wall



Insulation to required thickness is fitted between the vertical studs of the timber frame system. Ensure accurate trimming to achieve close butting joints and continuity of the insulation. Avoid any gaps within the mineral wool insulation and ensure the mineral wool insulation is not over compressed. To avoid thermal bridging through the timber studs an additional layer of insulation inside the timber frame studs would be highly recommended and will become mandatory at higher R-Value requirements.

In meeting higher R-value requirements an additional insulated plasterboard can be fitted to the inside of the stud frame e.g. Kooltherm® K17. This can be in combination with either Kooltherm® K12 between the frame or conventional mineral wool insulation.

Kingspan Kooltherm® K17 Insulated Plasterboard Product R-value	
Kooltherm® K17 Thickness (inc. Plasterboard)	R-Value (m²K/W)
35 mm	R1.15
40 mm	R1.35
50 mm	R1.80
60 mm	R2.35
70 mm	R2.80
80 mm	R3.25
90 mm	R3.70

The average percentage of timber framing in external walls in residential new builds is over 34%*

*BRANZ: External Research Report ER64 [2021]

A continuous layer of closed cell insulation will significantly improve the level of airtightness.

Do

Ensure the depth of insulation used in the stud is the correct thickness. Compressing mineral wool insulation will reduce the materials efficiency.

Don't

Don't install a separate vapour control layer, as it is not required when the Kooltherm® K17 is used.

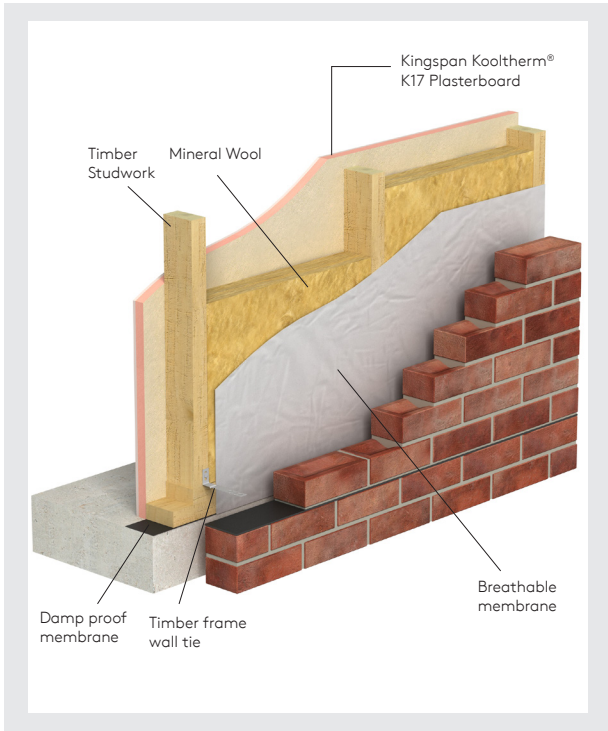
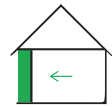


Figure 3

Internal Wall Insulation



Insulation to required thickness can be placed on framed and masonry constructions in both a new construction or as a retrofit solution.

The Kooltherm® K17 Insulated Plasterboard can reduce heating bills and/or increase thermal comfort, while having no impact on the external appearance of the building.

Likely to be the most acceptable solution to refurbishing the wall if the wall is being re-plastered or constraints on external aesthetics

Rooms heat up more quickly as the insulation is close to the internal surface of the room.

Wall insulation on the internal face of masonry, will reduce heating bills and increase thermal comfort.

Kingspan Kooltherm® K17 Insulated Plasterboard Product R-value	
Kooltherm® K17 Thickness (inc. Plasterboard)	R-Value (m²K/W)
35 mm	R1.15
40 mm	R1.35
50 mm	R1.80
60 mm	R2.35
70 mm	R2.80
80 mm	R3.25
90 mm	R3.70

Do

Only apply to walls which are in sound condition, free from moisture and secure.

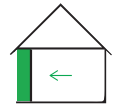
Don't

An adhesive method should not be used when tiles are to be applied. See the Kooltherm® K12 Insulated Plasterboard with a framing system in Fig 6.



Figure 5

Internal Wall Insulation with Services



When an external wall has a large level of services or requires a tiled finish, utilise the Kooltherm® K12 Framing Board in combination with a batten or internal frame.

Insulation to the required thickness can be paced on framed and masonry constructions in both a new construction or as a retrofit solution. Applying a batten or internal frame fixed through the insulation into the structure will enable the use of a specialty plasterboard lining or architectural designed finishes.

Kingspan Kooltherm® K12 Product R-value

Kooltherm® K12 Thickness	R-Value (m²K/W)
25 mm	R1.1
30 mm	R1.3
40 mm	R1.75
45 mm	R2.05
50 mm	R2.30

The specific insulation thickness may be built up from two thinner layers. As far as practically possible, the board joints in the two adjacent layers should be offset relative to each other, offering a robust thermal solution.

The thermal performance of Kooltherm offers optimal efficiency when using a standard 90mm stud frame.

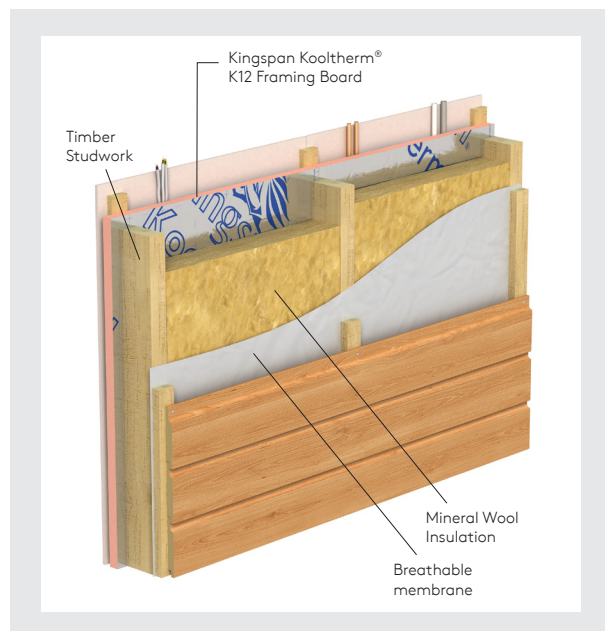


Figure 6

Do

Ensure adequate fixings are used to fasten the batten to the wall structure, through the layer of insulation.

Don't

Do not leave gaps or voids between the insulation boards, which would negatively impact the thermal efficiency of the system.

Superior Performing Solution

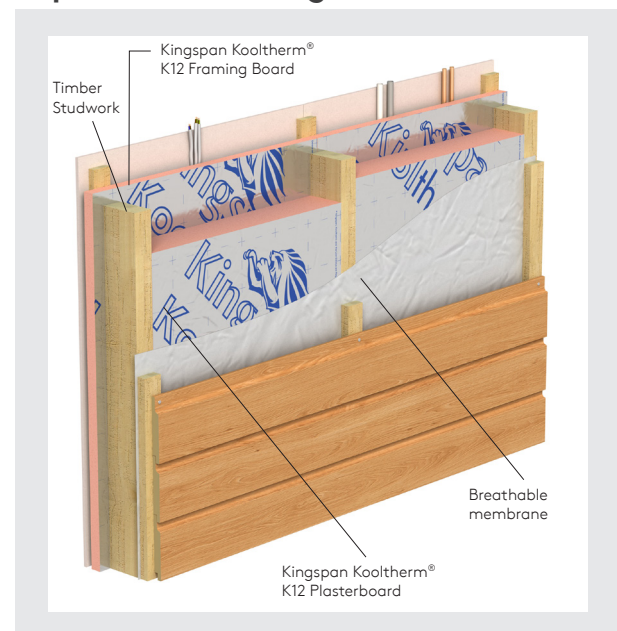
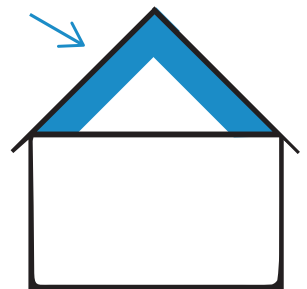


Figure 7

The solutions detailed eliminate the risk of cold bridging and condensation formation/pattern staining.

Roof Applications



Skillion Roof



When upgrading an existing raked/cathedral ceiling, applying an insulated plasterboard to the underside of the rafters is an effective continuous insulation solution. Insulation to the required depth pre-bonded to plasterboard can be screw fixed to the existing roof structure.

If the existing ceiling lining is in good condition it may be possible to fasten the insulated plasterboard through the existing lining, into the structure. It would be recommended to identify and mark the fixing points on the ceiling, prior to covering with the new insulated plasterboard. This process can also be used for flat ceiling where adequate headroom exists.

Kingspan Kooltherm® offers the thinnest commonly used solution. Greater thicknesses of under rafter insulation could mean an unacceptable reduction in headroom.

Kingspan Kooltherm® K17 Insulated Plasterboard Product R-value	
Kooltherm® K17 Thickness (inc. Plasterboard)	R-Value (m²K/W)
35 mm	R1.15
40 mm	R1.35
50 mm	R1.80
60 mm	R2.35
70 mm	R2.80
80 mm	R3.25
90 mm	R3.70

Do

Ensure the roof structure is in good dry condition prior to lining over with an insulated plasterboard.

Ensure that mandatory minimum requirements for ceiling height/headroom are not compromised

Don't

Don't use an adhesive fix to existing ceiling linings. Mechanical fixings should only be used.

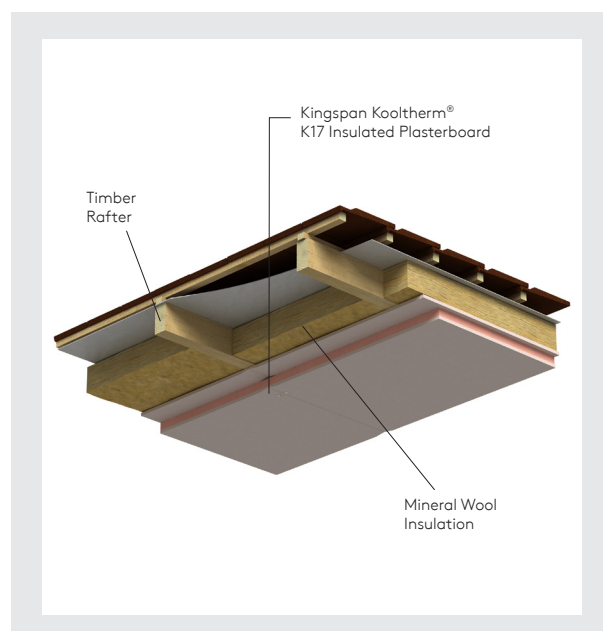
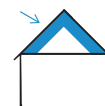


Figure 8

Cold Pitched Roof



Insulation to required thickness is fitted between and under the rafters leaving an airspace between the top of the insulation and the underside of sarking membrane for drainage. Using a Kingspan Kooltherm® K17 eliminates the need to include an additional vapour control layer as this is already an effective method vapour resistance. Technical advice should be sought for very cold climates.

This system can also be known as a 'ventilated' roof, where traditional ventilation is required at eaves, ensuring adequate displacement of moisture which may build up underneath the sarking membrane. Care should be taken at wall/ roof junctions to ensure continuity of the insulation and airtightness.

Kingspan Kooltherm® K17 Insulated Plasterboard Product R-value

Kooltherm® K17 Thickness (inc. Plasterboard)	R-Value (m²K/W)
35 mm	R1.15
40 mm	R1.35
50 mm	R1.80
60 mm	R2.35
70 mm	R2.80
80 mm	R3.25
90 mm	R3.70

Do

Ensure an appropriate air space is provided between insulation and sarking membrane. This can vary depending on the specific sarking used.

Don't

Don't use a thickness of an insulated plasterboard which would reduce the headroom to below mandatory minimum requirements.

If renovating, creating a 'room in the roof' will virtually always increase sale value by significantly more than the renovation costs.

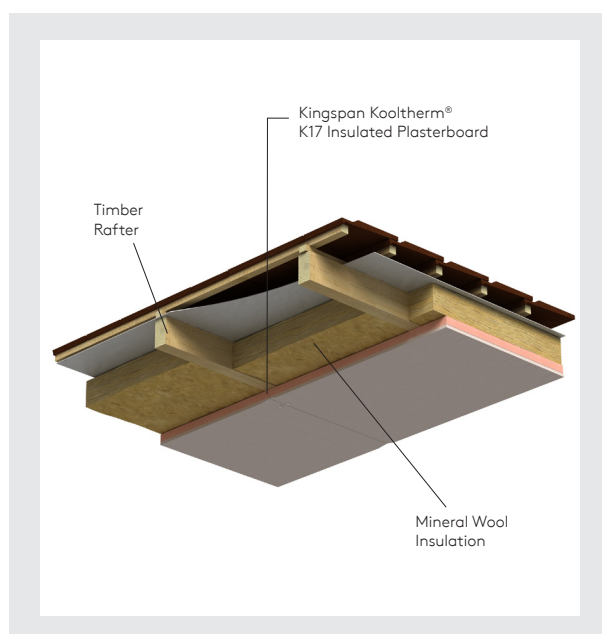


Figure 9

Contact Details

AUS

Kingspan Insulation Pty Ltd

T: 1300 247 235

E: info@kingspaninsulation.com.au

www.kingspaninsulation.com.au

For individual department contact details please visit

www.kingspaninsulation.com.au/contact

Kingspan Insulation Pty 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. 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, 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.

© Kingspan, Kingspan GreenGuard, KoolDuct, Kooltherm®, nilvent, OPTIM-R, QuadCore, TEK and the Lion Device are Registered Trademarks of the Kingspan Group plc in the UK, Ireland and other countries. All rights reserved.

TM Therma is a Trademark of the Kingspan Group plc.

Kingspan Insulation Pty Ltd is not associated with, and its products have not necessarily been tested by, the GREENGUARD Environmental Institute.

