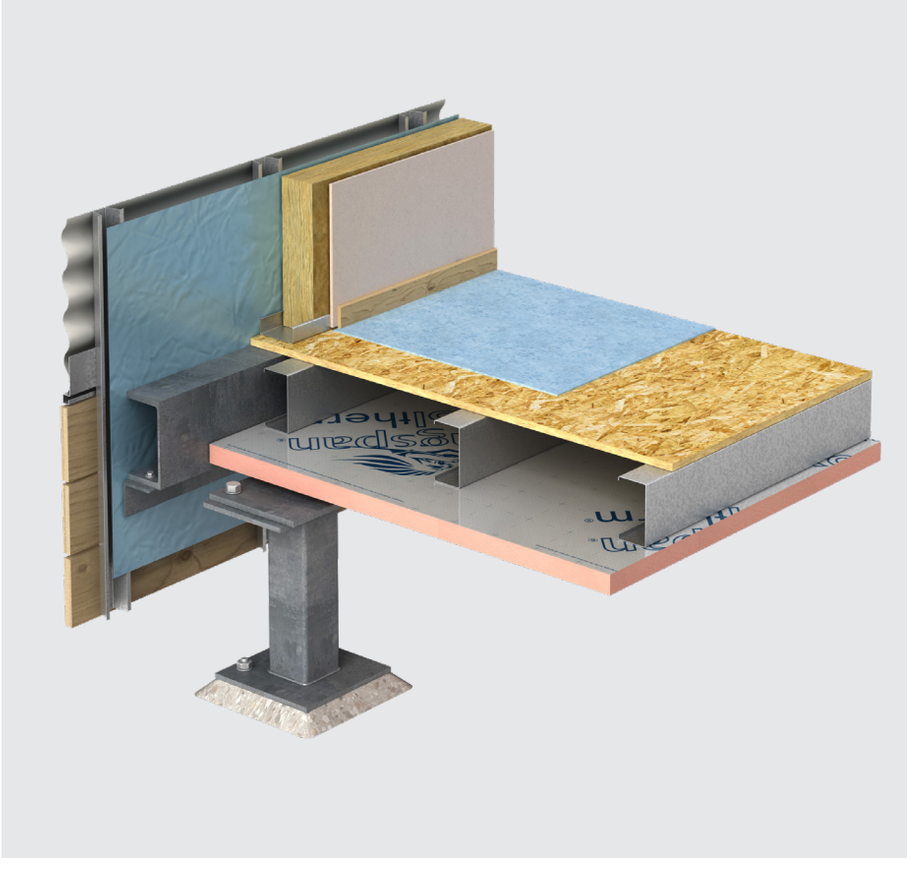
Insulation

Kooltherm® for Modular Construction

Insulation Solutions for Framed Applications



- Rigid thermoset phenolic insulation
- Fibre-free, closed cell insulation core
- Can be used continuous and between frames
- Suitable for use with timber frame and steel frame constructions
- Can eliminate cold bridging
- Resistant to the passage of water vapour
- Offers a durable solution for transportation
- Compliant with AS/NZS 4859.1:2018
- Made in Australia

Fibre-free Core

AUSTRALIAN MADE

Kingspan®

Modular Construction

Modular construction, also known as prefabricated construction, is becoming increasingly popular over time. It is already widely used in many parts of the world, such as European countries, and is gaining traction in Australia. The adoption of modular construction in Australia has been increasing over the past decade, offering several advantages over traditional construction techniques.

The major benefits of modular construction are efficiency, speed, and cost-effectiveness. It is also a more sustainable option, as it generates less material waste and provides better recycling opportunities.

Insulation is vital in modular construction, contributing to energy efficiency, thermal comfort, and overall building performance. The choice of insulation material impacts both the ease of installation and the effectiveness of the insulation.

Rigid insulation boards, for example phenolic boards, offer several advantages over traditional glasswool (fiberglass) insulation:

1. Ease of Installation: Rigid boards are pre-formed panels that can be quickly and precisely installed within modular components, reducing installation time and labor costs. In contrast, glasswool requires careful handling and cutting to fit specific spaces, which can be more time-consuming.
2. Moisture Resistance: Many rigid insulation materials have low water absorption properties, making them resistant to moisture-related issues such as mold growth. Glasswool, on the other hand, can absorb moisture, which may compromise its insulating properties and lead to deterioration over time.
3. Thermal Performance: Rigid boards often provide higher R-values per inch of thickness compared to glasswool, offering better thermal resistance and enhancing the energy efficiency of modular buildings.

Given these advantages, rigid insulation boards are a better option in modular construction due to their ease of use, durability, and superior performance compared to conventional glasswool insulation.

Kingspan®

Kingspan Insulation manufactures flexible insulation, rigid board insulation, wall & roof membrane and roof safety mesh for buildings. Our products are supported by technical advice on product performance and application; and customer service.

Our extensive range of products are suitable for a variety of applications:

Kooltherm®

The phenolic Kooltherm range is a great example of our knowledge and expertise combining to create a rigid phenolic insulation board for roof, wall and floor.

With a thermal conductivity from as low as 0.022 W/m.K, Kingspan Kooltherm is the most thermally efficient and thinnest commonly used insulation board for any specific R-value. This means that you can benefit from reduced heating or cooling demand or use thinner boards to gain more space in your building. 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.

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

1. Fibre-free, closed cell insulation core
2. Low smoke development
3. Rigid thermoset phenolic insulation
4. Compliant with AS/NZS 4859.1:2018
5. Slim profile insulation boards

Floor Application

Installation Instructions

Insulation to the Underside of a Suspended Framed Floor

Kingspan Kooltherm K12 Framing Board can be mechanically fixed as a continuous thermal insulation to the underside of floor joists, where the subfloor void is not an occupied zone. Installing the insulation can occur by either inverting or raising the floor chassis onto a platform.

1. Pre-plan the board arrangement, so the insulation board can be best utilised and avoid unsupported edges.
2. The floor frame spacings should not exceed 600mm centres
3. Ensure that the boards are lightly butted and continuity of insulation is maintained.
4. Fix the insulation boards to the external side of the floor frame, using a suitable self-drilling fastener for a metal frame.
5. Use a minimum of 13 fasteners, with a washer diameter of 75mm, distributed across a 2400 mm x 1200 mm board, ensuring adequate restraint for any future transportation (see Figure 4).
6. Fasteners should be positioned no less than 50 mm, and no more than 150 mm from edge of board.
7. For insulation board edges which are parallel to a joist, ensure the edge of the board is supported on a joist. Place a fastener in the centre of the joist using a washer with a diameter of 75mm, enabling an equal overlap of the adjoining board.

Insulation Placed Between Joists of a Suspended Framed Floor

When assessed as suitable to meet the project requirements, the Kingspan Kooltherm K12 Framing Board can be installed as a discontinuous thermal insulation between the floor joists, where the subfloor void is not an occupied zone. The installation of Kingspan Kooltherm K12 Framing Board in suspended floor constructions should be carried out before commencement of floor boarding.

1. The insulation boards should be cut to fit snugly between the floor joists. Measure the distance between the joists prior to cutting the boards as spacings can vary.
2. The floor frame spacings should not exceed 600mm centres.
3. In order to ensure insulation boards are retained in position on the adjacent joist, a galvanised steel saddle clips should be used as support (see Figure 5).
4. Ensure the insulation boards are fitted tightly between the joists, and any gaps are filled with expanding urethane sealant.
5. Fix the insulation boards to the galvanised steel saddle clips adequately, to prevent displacement during transportation.

Figure 5 Joist Saddle Clip

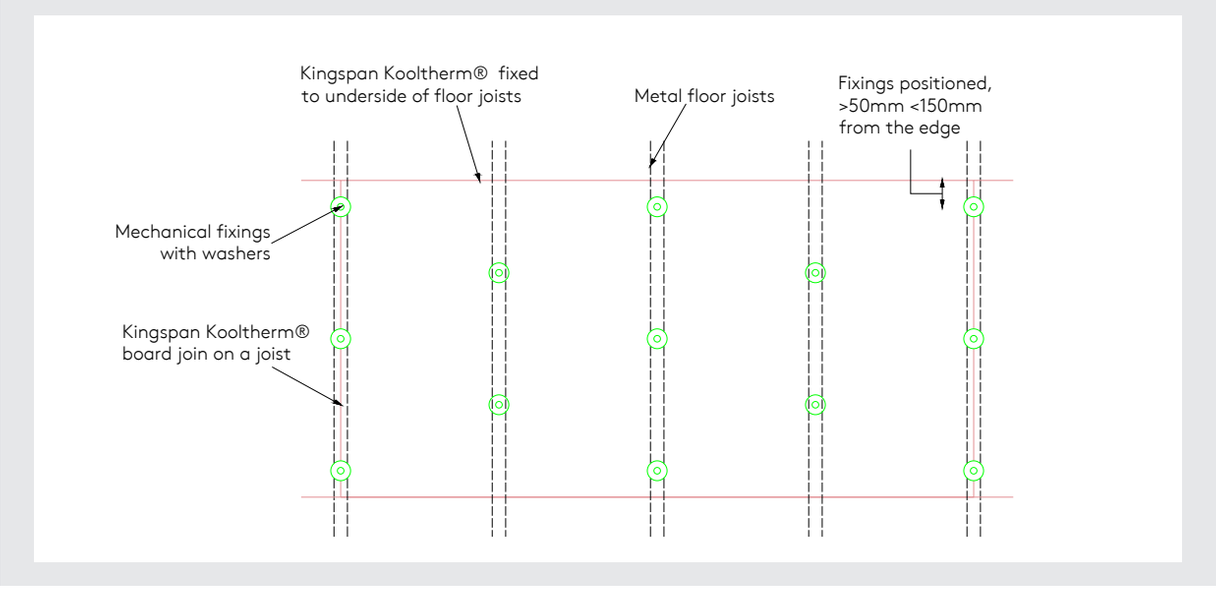


Figure 4 Typical Fastener Pattern

Floor Application

Suspended Metal Frame Floor

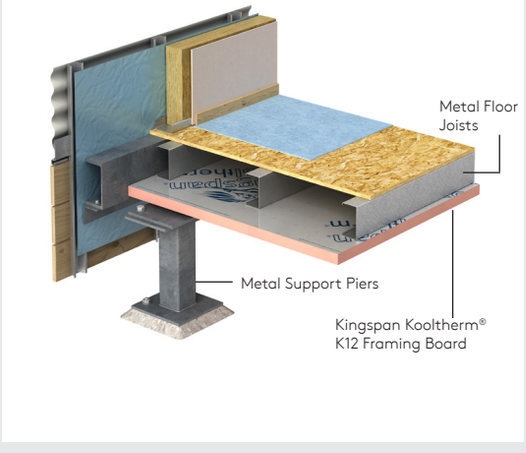


Figure 1

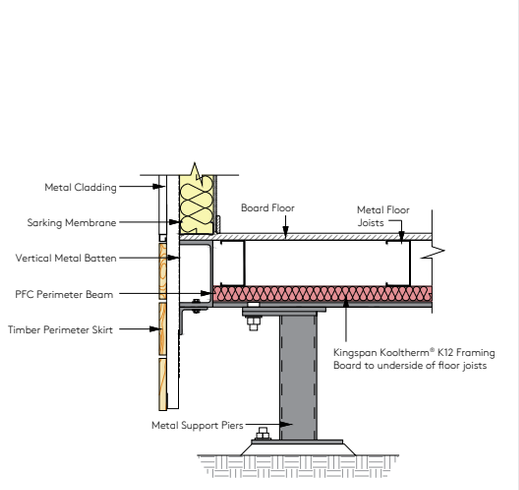


Figure 2

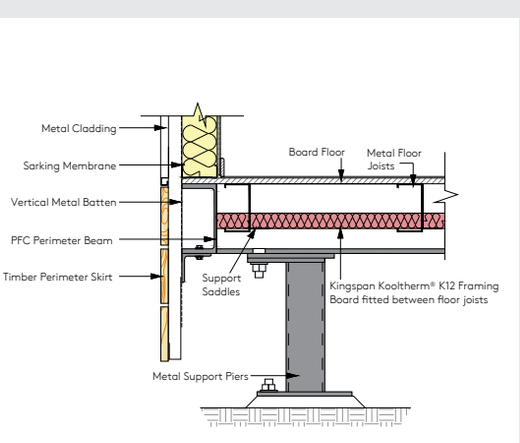


Figure 3

Thermal Performance

As framed systems can vary and use differing levels of steel within the structure, the Total Thermal Performance of systems can vary greatly.

For customised project specific total R-value calculations, please contact Kingspan Insulation Technical Services on 1300 247 235 or email technical@kingspaninsulation.com.au.

Kingspan Kooltherm K12 Framing Board Product R-value*	
Nominal Product Thickness	Declared Product R-value at 23°C
25 mm	R1.10
30 mm	R1.30
40 mm	R1.75
45 mm	R2.05
50 mm	R2.30
80 mm	R3.60

* Calculated in accordance with AS 4859.1:2018

Specification Guide

The wall insulation shall be CodeMark-certified Kingspan Kooltherm K12 Framing Board ___ mm thick, comprising a rigid thermoset phenolic insulation core with composite foil facings on both sides manufactured under a management system certified to ISO 9001:2015, ISO 37301, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018 and ISO 37301:2021 by Kingspan Insulation Pty Ltd and shall be installed in accordance with the instructions issued by them.

A Project Specific Warranty provided by Kingspan Insulation must be submitted.

Wall Application

Metal Frame Wall

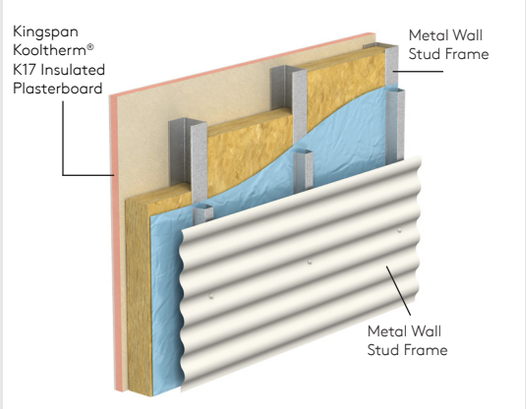


Figure 6

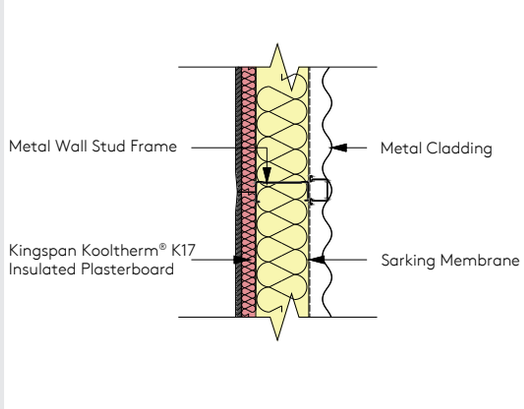


Figure 7

Thermal Performance

Kingspan Kooltherm K17 Insulated Plasterboard Product R-value*	
Nominal Product Thickness	Declared Product R-value at 23°C
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

* Calculated in accordance with AS 4859.1:2018

As framed systems can vary, use differing levels of steel within the structure, the total thermal performance of systems can vary greatly.

For customised project specific total R-value calculations, please contact Kingspan Insulation Technical Services on 1300 247 235 or email technical@kingspaninsulation.com.au.

Specification Guide

The wall dry-lining insulation shall be Group 1 CodeMark-certified Kingspan Kooltherm K17 Insulated Plasterboard _____ mm thick, with a tested $SMOGRA_{RC}$ (AS ISO 9705:2003 (R2016) Room Corner Test) of not more than 10 m^2/s^2 x 1000, comprising a rigid thermoset phenolic insulation core with 10 mm plasterboard facing bonded to its front surface and a tissue based facing on its reverse surface, manufactured* under a management system certified to ISO 9001:2015, ISO 37301, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018 and ISO 37301:2021 by Kingspan Insulation Pty Ltd and shall be installed in accordance with the instructions issued by them.

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* Applies only to the Kingspan Kooltherm K10 insulation board used in the manufacture of this composite insulated plasterboard product.

Installation Instructions

Dry Wall Plasterboard

Kingspan Kooltherm K17 Insulated Plasterboard can be applied utilising a variety of traditional or modern dry-lining techniques, to dry and structurally sound walls. These include traditional fixing to metal furring systems. The particular system employed will depend on the construction or design of the wall to which Kingspan Kooltherm K17 Insulated Plasterboard is to be fixed. The plasterboard's tapered edge enables a flat seamless surface equal to traditional plaster finish after the correct jointing procedures as per the plasterboard manufacturer's recommendation have been completed.

Kingspan Kooltherm K17 Insulated Plasterboard must be installed in accordance with AS/NZS 2589:2007 Gypsum linings – Application and finishing

1. Place framing / battens at a maximum of 600 mm centres and positioned horizontally at floor and ceiling level to support the insulated plasterboard.
2. The insulated plasterboard can be laid in a horizontal or vertical orientation to best suit the room configuration.
3. When joining the insulated plasterboard on the frame / batten, ensure sufficient bearing is offered to enable the minimum edge distance for the fixing.
4. Fix the Kingspan Kooltherm K17 Insulated Plasterboard to each metal framing section with self drilling plasterboard screws at 200 mm centres and not less than 10 mm from the edges of the board along the line of the studs.
5. Drive fixings straight and embed heads just below the surface of the board. Care should be taken not to overdrive the fixing.
6. Screws used for plasterboard fixing must comply with AS 3566.2:2002 self-drilling screws complying with the building and construction industry corrosion resistance requirements.

Roof Application

Thermal Performance

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30 mm	R1.30
40 mm	R1.75
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50 mm	R2.30
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80 mm	R3.25
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Specification Guide

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The wall dry-lining insulation shall be Group 1 CodeMark-certified Kingspan Kooltherm K17 Insulated Plasterboard _____ mm thick, with a tested $SMOGRA_{RC}$ (AS ISO 9705:2003 (R2016) Room Corner Test) of not more than 10 m^2/s^2 x 1000, comprising a rigid thermoset phenolic insulation core with 10 mm plasterboard facing bonded to its front surface and a tissue based facing on its reverse surface, manufactured* under a management system certified to certified to ISO 9001:2015, ISO 37301, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018 and ISO 37301:2021 by Kingspan Insulation Pty Ltd and shall be installed in accordance with the instructions issued by them.

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* Applies only to the Kingspan Kooltherm K10 insulation board used in the manufacture of this composite insulated plasterboard product.

Installation Instructions

Insulation Board Under Rafter Level

Kingspan Kooltherm K12 Framing Board can be applied as a continuous thermal insulation to the underside of roofing rafters at a maximum spacings of 600mm. Utilising traditional metal furring/battens systems to secure the chosen internal lining material. The particular system employed will depend on the construction or design of the ceiling lining.

1. Pre-plan the board arrangement, so the board can be best utilised and avoid unsupported edges.
2. Ensure that the boards are lightly butted and continuity of insulation is maintained.
3. Use large headed screws as temporary fixings prior to the secondary support batten being fitted.
4. Install the batten system at a maximum spacings of 600mm, through the insulation securing the board into position.
5. Fix the internal ceiling lining to the batten in the traditional matter.

Insulated Dry Lining Under Rafter Level

Kingspan Kooltherm K17 Insulated Plasterboard may be used to line ceilings or infill where an exposed rafter is desired. Installation is similar to that of standard plasterboard

1. The insulated plasterboard can be laid in a horizontal or vertical orientation to best suit the room configuration.
2. When joining the insulated plasterboard on the frame / batten, ensure sufficient bearing is offered to enable the minimum edge distance for the fixing.
3. Sheets should be fixed using plasterboard screws located at 150 mm centres.
4. Ensure fixings are located no less than 10 mm from the edges of the sheet.
5. Allow a fixing length to provide a minimum embedment of 20 mm into the rafter or sufficient tread penetration through metal.
6. Fixings should be driven straight with the heads embedded just below the surface of the sheet. Care should be take not to overdrive the fixing.

Roof Application

Metal Frame Roof

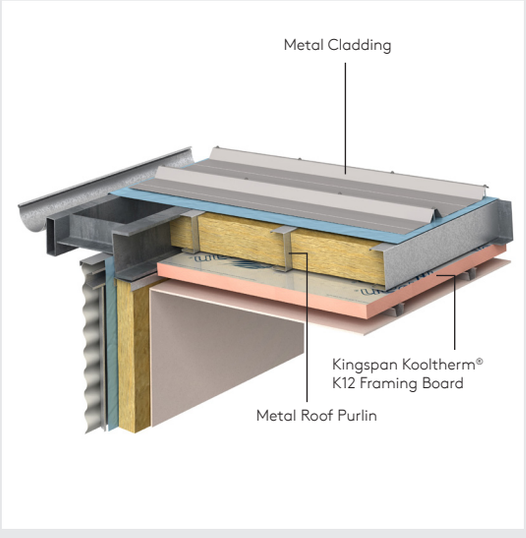

Figure 8

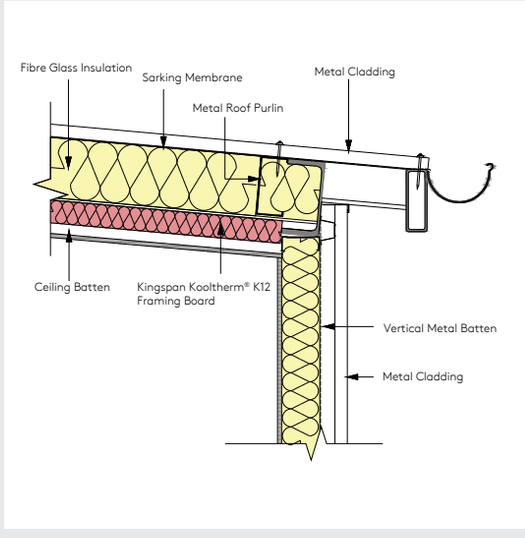

Figure 9

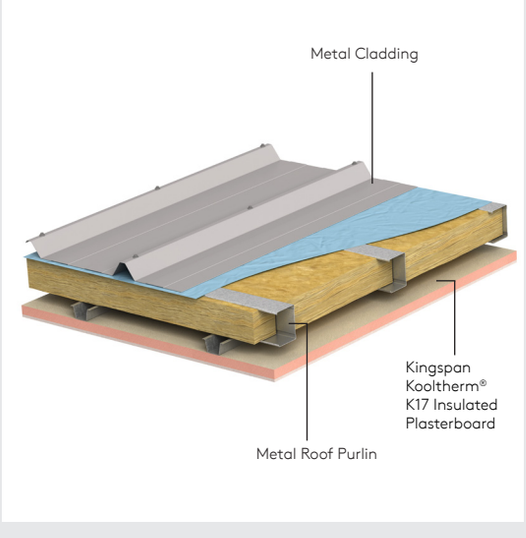

Figure 10

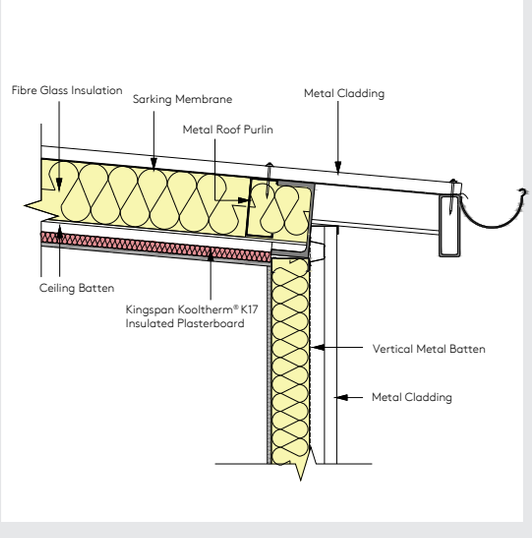

Figure 11

Contact Details

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