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Kingspan Kooltherm K18 Insulation

INSTALLATION GUIDE

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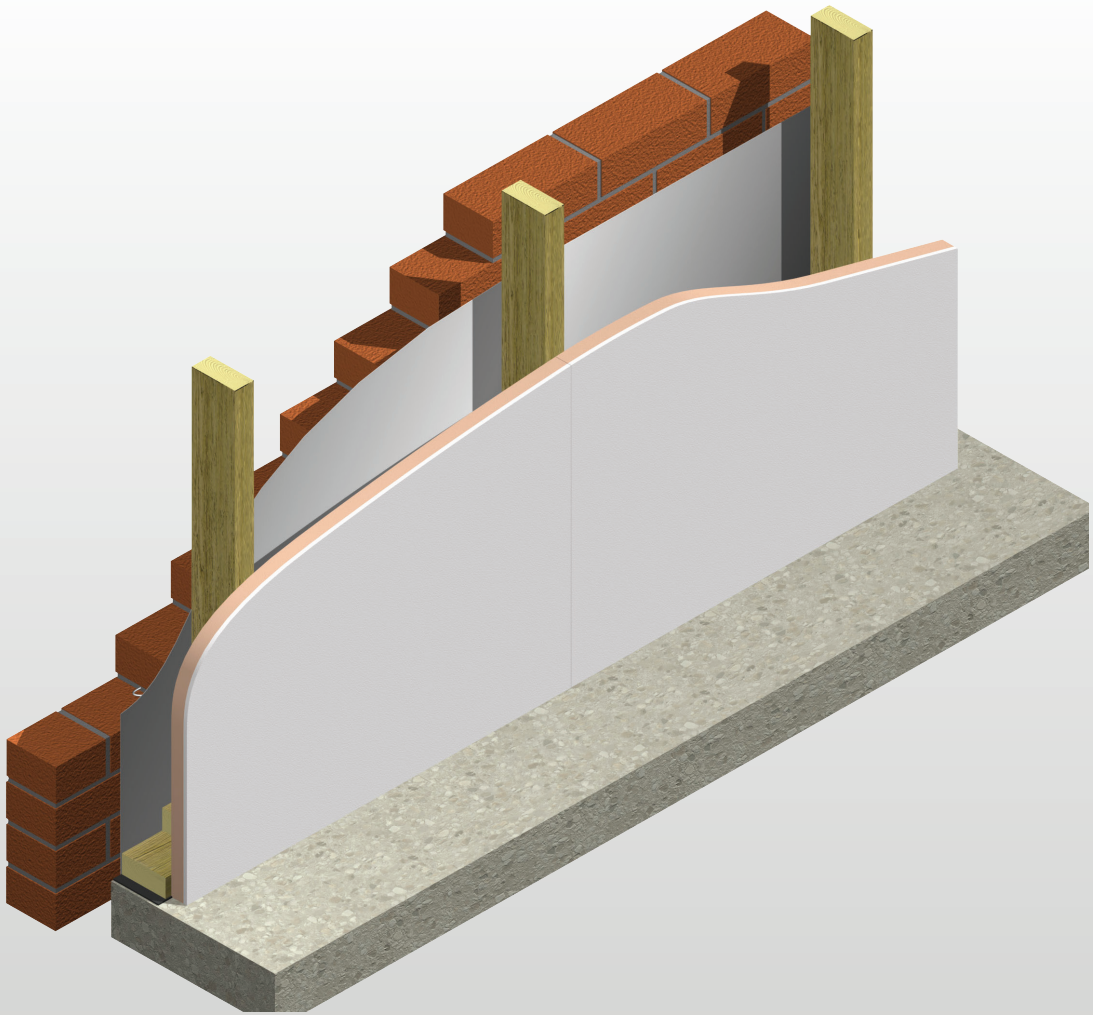
Kooltherm® K18 Insulated Plasterboard

INSULATED DRY-LINING PLASTERBOARD FOR MECHANICAL FIXING



- Super high performance rigid thermoset phenolic insulation
- Fibre-free, closed cell insulation core
- 3-in-1 insulation, dry-lining and vapour control
- Also available in a range of other selected lining materials
- Group 1 NCC fire classification
- Allows quick response heating and cooling
- Clear cavity is maintained - resists moisture penetration
- Resistant to the passage of water vapour
- Easy to handle and install
- No CFC or HCFC used in manufacture
- Has zero ODP and low GWP
- Compliant with AS/NZS 4859.1:2018
- Made in Australia

Fibre-free Core

AUSTRALIAN MADE

Kingspan®

Low Energy – Low Carbon Buildings

Typical Constructions and Total R-values

Mechanically Fixed to Timber Framing

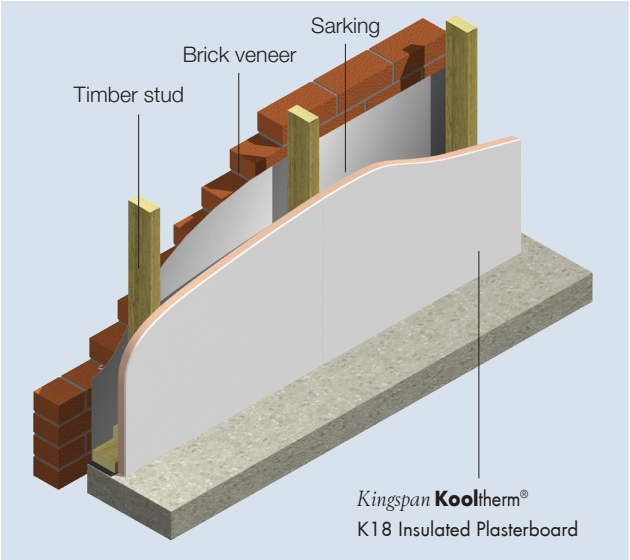


Figure 1

Mechanically Fixed to Internal Side of Steel Frame with Close Jointed Cladding

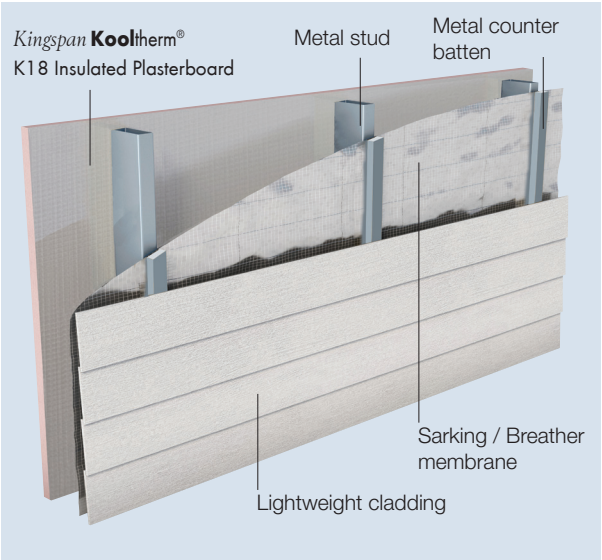


Figure 2

Thermal Performance

NCC 2019 prescribes different methods to determine Total R-value Calculations for Volume 1 and Volume 2.

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume One, Class 2 to 9 buildings & NCC Volume Two, Class 1 & 10a buildings

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.1	R_T2.2
40 mm	R_T2.3	R_T2.4
50 mm	R_T2.8	R_T2.8
60 mm	R_T3.4	R_T3.5
70 mm	R_T3.8	R_T4.0
80 mm	R_T4.3	R_T4.5
90 mm	R_T4.8	R_T5.0

Assumptions

The R-values shown are Total R-values for the building element as required by the Energy Provisions of the National Construction Code, calculated in accordance with AS/NZS 4859.2 2018 & NZS 4214. *Kingspan* **Kool**therm® products are manufactured, tested and packaged in conformance with AS/NZS 4859.1:2018.

Fire Resistance

Examples shown are suitable for NCC Class 1 & 10a housing and Fire-Resisting Construction Type C walls in NCC Class 2 – 9 buildings. For Fire-Resisting Construction Type A & B walls in NCC Class 2 – 9 buildings a Performance Solution is required. Please contact Kingspan Insulation Technical Services on 1300 247 235 or email technical@kingspaninsulation.com.au for further guidance.

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume One, Class 2 to 9 buildings

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.0	R_T2.0
40 mm	R_T2.2	R_T2.2
50 mm	R_T2.6	R_T2.7
60 mm	R_T3.2	R_T3.3
70 mm	R_T3.7	R_T3.8
80 mm	R_T4.1	R_T4.3
90 mm	R_T4.6	R_T4.8

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for for NCC Volume Two, Class 1 & 10a buildings and NCC Volume One, Class 2 sole-occupancy unit or a Class 4 part of a building

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.0	R_T2.1
40 mm	R_T2.2	R_T2.3
50 mm	R_T2.7	R_T2.7
60 mm	R_T3.3	R_T3.4
70 mm	R_T3.7	R_T3.9
80 mm	R_T4.2	R_T4.4
90 mm	R_T4.7	R_T4.9

Mechanically Fixed to Internal Side of Timber Frame with Close Jointed Cladding

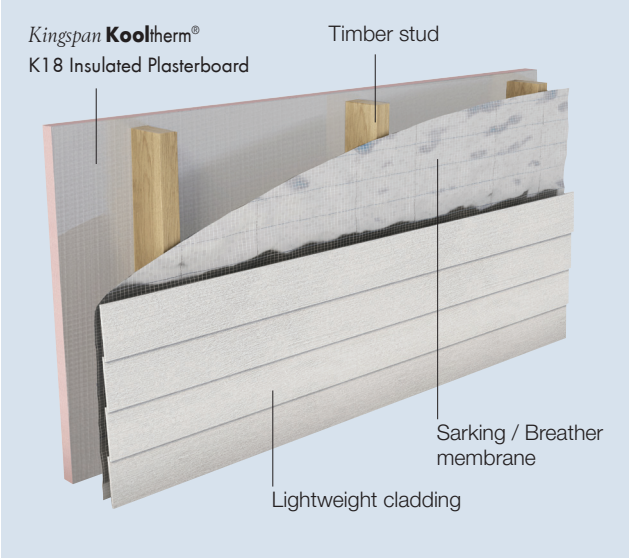


Figure 3

Mechanically Fixed to Timber Rafters (Covered Beams) - Tiled Roof

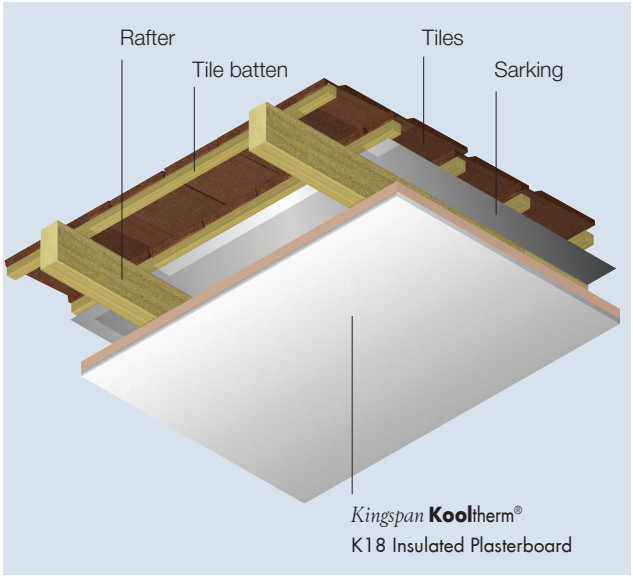


Figure 4

Thermal Performance

NCC 2019 prescribes different methods to determine Total R-value Calculations for Volume 1 and Volume 2.

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume One, Class 2 to 9 buildings and NCC Volume Two, Class 1 & 10a buildings

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T1.8	R_T1.9
40 mm	R_T2.1	R_T2.1
50 mm	R_T2.5	R_T2.6
60 mm	R_T3.1	R_T3.2
70 mm	R_T3.6	R_T3.7
80 mm	R_T4.0	R_T4.2
90 mm	R_T4.5	R_T4.7

Assumptions

The R-values shown are Total R-values for the building element as required by the Energy Provisions of the National Construction Code, calculated in accordance with AS/NZS 4859.2 2018 & NZS 4214. *Kingspan* **Kool**therm® products are manufactured, tested and packaged in conformance with AS/NZS 4859.1:2018.

Fire Resistance

Examples shown are suitable for NCC Class 1 & 10a housing and Fire-Resisting Construction Type C walls in NCC Class 2 – 9 buildings. For Fire-Resisting Construction Type A & B walls in NCC Class 2 – 9 buildings a Performance Solution is required. Please contact Kingspan Insulation Technical Services on 1300 247 235 or email technical@kingspaninsulation.com.au for further guidance.

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume One, Class 2 to 9 buildings

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.3	R_T1.9
40 mm	R_T2.5	R_T2.1
50 mm	R_T3.0	R_T2.6
60 mm	R_T3.6	R_T3.2
70 mm	R_T4.1	R_T3.7
80 mm	R_T4.5	R_T4.2
90 mm	R_T5.0	R_T4.7

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume Two, Class 1 & 10a buildings and NCC Volume One, Class 2 sole-occupancy unit or a Class 4 part of a building

Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.3	R_T1.9
40 mm	R_T2.5	R_T2.1
50 mm	R_T2.9	R_T2.5
60 mm	R_T3.6	R_T3.2
70 mm	R_T4.0	R_T3.7
80 mm	R_T4.5	R_T4.2
90 mm	R_T5.0	R_T4.7

Typical Constructions and Total R-values (cont'd)

Mechanically Fixed to Timber Rafters (Covered Beams) - Metal Roof

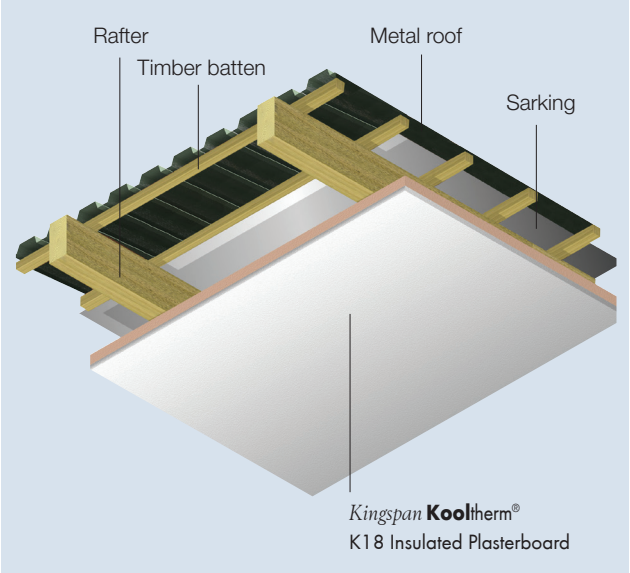


Figure 5

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume One, Class 2 to 9 buildings		
Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.3	R_T1.9
40 mm	R_T2.5	R_T2.1
50 mm	R_T3.0	R_T2.6
60 mm	R_T3.6	R_T3.2
70 mm	R_T4.0	R_T3.7
80 mm	R_T4.5	R_T4.2
90 mm	R_T5.0	R_T4.7

Total R–values for various thicknesses of *Kingspan* **Kool**therm® K18 Insulated Plasterboard applicable for NCC Volume Two, Class 1 & 10a buildings and NCC Volume One, Class 2 sole-occupancy unit or a Class 4 part of a building		
Product Thickness (inc. Plasterboard)	Heat flow in	Heat flow out
35 mm	R_T2.3	R_T2.0
40 mm	R_T2.5	R_T2.1
50 mm	R_T2.9	R_T2.5
60 mm	R_T3.6	R_T3.2
70 mm	R_T4.0	R_T3.7
80 mm	R_T4.5	R_T4.2
90 mm	R_T5.1	R_T4.8

Product Details

Product Description

Kingspan **Kool**therm® K18 Insulated Plasterboard is a super high performance, fibre-free rigid thermoset, closed cell phenolic insulation, sandwiched between a front facing of tapered edge gypsum based plasterboard, and a reverse facing of low emissivity foil autohesively bonded to the insulation core during manufacture.

Fibre-free Core

Kingspan **Kool**therm® K18 Insulated Plasterboard is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

zero o.d.p

Product Data		
Declared Thermal Conductivity	Insulant	0.021 W/m.K at 23°C (Insulant thickness ≥ 45 mm) 0.023 W/m.K at 23°C (Insulant thickness 25 - 44 mm)
	Plasterboard	0.17 W/m.K at 23°C (Plasterboard thickness 10 mm)
Emittance	Foil Face	E0.14
Product Dimensions		2400 mm x 1200 mm (2.88 m²) *Other dimensions available upon enquiry.* *Minimum order quantities apply*
Nominal Product Thickness (inc. Plasterboard)		35, 40, 50, 60, 70, 80, 90 mm *Other thicknesses available upon enquiry.* *Minimum order quantities apply*
Nominal Plasterboard Thickness		10 mm

Alternative lining boards, such as fibre cement sheets, can also be bonded to the insulation core to create customised finishes and facings in our *Kingspan* **Kool**therm® K18+ Insulated Lining Board range. Please contact us for more information.

Product R-value

Nominal Product Thickness (inc. Plasterboard)	Declared Product R-value at 23°C
35 mm	R1.16
40 mm	R1.36
50 mm	R1.81
60 mm	R2.41
70 mm	R2.91
80 mm	R3.41
90 mm	R3.86

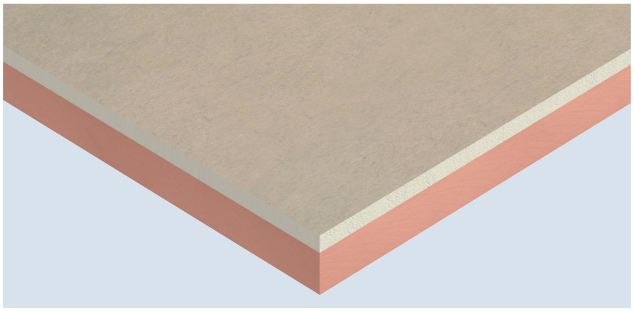


Figure 6 Super high performance Kingspan **Kool**therm® K18 Insulated Plasterboard

Specification Guide

Kingspan **Kool**therm® K18 Insulated Plasterboard

The wall dry-lining insulation shall be *Kingspan* **Kool**therm® K18 Insulated Plasterboard _____ mm thick, with a tested smoke obscuration of not more than 5 m^2/kg, comprising a CFC/HCFC–free and zero Ozone Depletion Potential (ODP) rigid thermoset phenolic insulation core with 10 mm plasterboard facing bonded to its front surface and a composite foil facing on its reverse surface, manufactured* under a management system certified to ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and ISO 50001:2011 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.

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

Standards and Approvals

Kingspan **Kool**therm® K10 insulation board used for *Kingspan* **Kool**therm® K18 Insulated Plasterboard is manufactured to the highest standards and certified under the following management systems:

Standard	Management System
ISO 9001:2015	Quality Management
ISO 14001:2015	Environmental Management
OHSAS 18001:2007	Health and Safety Management
ISO 50001:2011	Energy Management

Product Testing

Characteristic	Standard	Result
Compressive Stress (Insulant)	AS 2498.3	Typically exceeds 100 kPa at 10% compression
Water Vapour Resistance	BS EN 12086:1997 / I.S. EN 12086:1998	> 35 MN·s/g For the purpose of calculation of condensation risk, the resistivity of the plasterboard component of the product should be taken as 50 MN·s/g·m

Fire Performance

Test	Test Method	Result
Ignitability, Flame spread Heat release, Smoke release	AS 1530.3	Spread of Flame Index: 0 Smoke Development ≤ 3*
NCC Group Number in accordance with AS 5637.1	AS/NZS 3837 / Amdt 1	Group 1**
Smoke Obscuration	AS/NZS 3837	< 5m2/kg

** Applies only to the Kingspan* **Kool**therm® K10 *insulation board used in the manufacture of this composite insulated plasterboard product.*
*** Applies to compliant plasterboard facing.*

Durability

If correctly applied, *Kingspan* **Kool**therm® products can be expected to have a long life of service.

Their durability depends on the supporting structure and the conditions of its use.

Kingspan **Kool**therm® products are warranted for a period of 10 years for both residential and commercial installations.*

** Subject to the terms of the complete Kingspan* **Kool**therm® *warranty document which is available upon request or downloadable from www.kingspaninsulation.com.au.*

Limitations

Kingspan **Kool**therm® K18 Insulated Plasterboard has a gypsum plasterboard face. It should, therefore, not be used to isolate dampness nor be used in continuously damp or humid conditions.

Environmental Data

Aspect	Characteristic
Recyclability	Non-contaminated insulation site waste is recyclable, but there are currently no facilities in Australia to process returned material
Re-usability	Re-usable if removed with care (long term of service expected)
Water Use	No water used in Kingspan Insulation's manufacturing process
Blowing Agent Global Warming Potential (GWP)	Manufactured with a blowing agent that has low GWP
Blowing Agent Ozone Depletion Potential (ODP)	Manufactured with a CFC/HCFC-free blowing agent that has zero ODP
Packaging	Contains 0% recycled product Polythene wrap and EPS skids 100% recyclable

Installation Instructions

Dry Wall Plasterboard

Kingspan **Kool**therm® K18 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 or timber frames, metal furring systems or vertical timber batten systems. The particular system employed will depend on the construction or design of the wall to which *Kingspan* **Kool**therm® K18 Insulated Plasterboard is to be fixed. The tapered edge to the plasterboard enables a flat seamless surface equal to traditional plaster finishes after the correct jointing procedures as per plasterboard manufacturer's recommendation have been completed.

Kingspan **Kool**therm® K18 Insulated Plasterboard must be installed in accordance with AS/NZS 2589:2007 Gypsum linings – Application and finishing.

Mechanical Fixing to Metal or Timber Frames/Metal Stud and Track/Battens

This method may be used on timber frame, metal stud and track constructions or on any dry masonry wall that will support and retain the battens and associated fixings.

1. Place framing / battens at a maximum of 600 mm centres and positioned horizontally at floor and ceiling level / horizontal joints to support the *Kingspan* **Kool**therm® K18 Insulated Plasterboard.
2. Ensure the framing/ battens will be wide enough to offer a minimum 20 mm support to all edges of the board.
3. Use plasterboard screws long enough to allow for a minimum 20 mm embedment into the stud or, alternatively, suitable galvanised plasterboard nails, should be placed at 200 mm centres and not less than 10 mm from the edges of the board along the line of the studs.
4. Drive fixings straight and embed heads just below the surface of the board. Care should be taken not to overdrive the fixing.
5. 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.

Mechanical Fixing to Metal Furring Systems

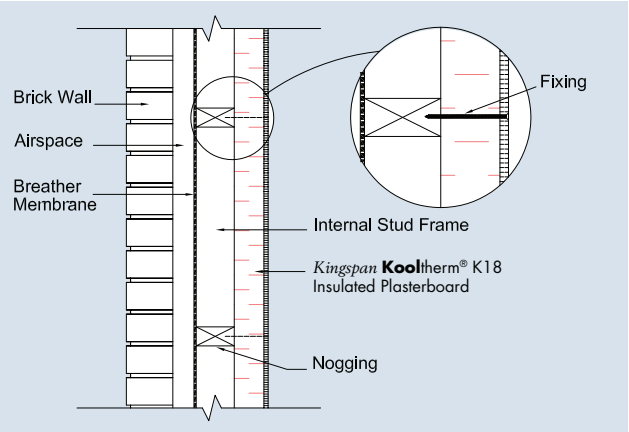


Figure 7 Side elevation - Brick veneer wall with Kingspan **Kool**therm® K18 Insulated Plasterboard

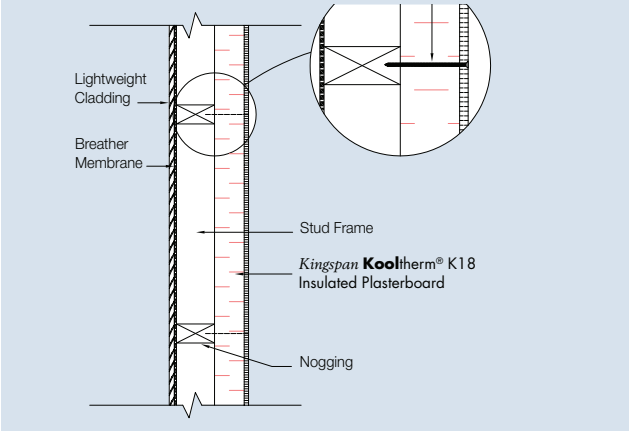


Figure 8 Side elevation - Lightweight cladded stud wall with Kingspan **Kool**therm® K18 Insulated Plasterboard

Kingspan **Kool**therm® K18 Insulated Plasterboard can be fixed by the use of proprietary metal support systems to brick, block, stone or concrete walls. The metal frame should be fixed to the masonry or concrete walls.

1. Provide a true and level base for the *Kingspan* **Kool**therm® K18 Insulated Plasterboard by fixing the metal frame to the masonry or concrete wall in accordance with the manufacturer's instructions.
2. Set the frame vertically at a maximum of 600 mm centres to coincide with the board joints and the midpoint of the board.
3. Fix the *Kingspan* **Kool**therm® K18 Insulated Plasterboard to each metal framing section with self drilling plasterboard screws at 200 mm centres.
4. Drive fixings straight and embed heads just below the surface of the board. Care should be taken not to overdrive the fixing.

Mechanical Fixing to Timber Joists or Rafters

Kingspan **Kool**therm® K18 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. A minimum of 20 mm bearing onto the timbers must be offered at each sheet joint.
2. Sheets should be fixed using either drywall screws or suitable galvanised plasterboard nails located at 150 mm centres.
3. Ensure fixings are located no less than 10 mm from the edges of the sheet.
4. Fixings should be long enough to allow a minimum embedment of 20 mm into the timber.
5. Fixings should be driven straight with the heads embedded just below the surface of the sheet. Care should be taken not to overdrive the fixing.

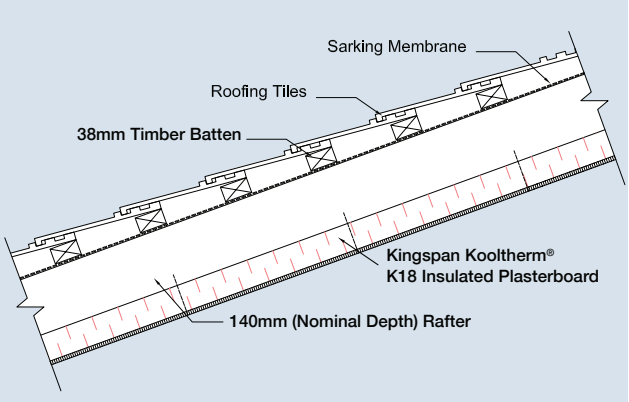


Figure 9 Side elevation - Raked ceiling with Kingspan **Kool**therm® K18 Insulated Plasterboard

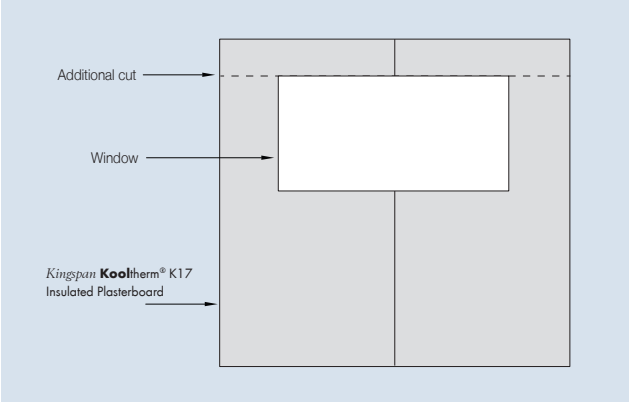


Figure 10 Kingspan **Kool**therm® K18 Insulated Plasterboard *Installation details for cutting*

General Requirements

Cutting

Cutting should be carried out either by using a fine toothed saw, or by scoring with a sharp knife through the insulation and scoring the back of the plasterboard itself, then snapping the board over a straight edge and then cutting the facing on the other side. Ensure accurate trimming to achieve close-butting joints and continuity of insulation. Sheets being cut should be adequately supported to prevent breakage.

When using a fine toothed saw, ensure edges are supported to avoid excessive vibration.

When multiple cuts on a board are required, such as around windows, consider segmenting the board into smaller sections to prevent excessive movement of the board (Figure 10).

Board Orientation

The *Kingspan* **Kool**therm® K18 Insulated Plasterboard can be laid in a horizontal or vertical orientation to best suit the room configuration.

Services

Where electrical and plumbing services are not surface mounted or chased into the structure, carefully recess the back of the insulation to accommodate the services.

To ensure an appropriate rate of heat dissipation from cables, the current-carrying capacity of any electrical services partially surrounded by thermal insulation should be determined in accordance with AS/NZS 3008.1 series.

Ensure excess insulation is not removed to minimise thermal weaknesses.

Packaging

According to quantity, the boards are supplied in packs, labelled and shrink-wrapped in polythene.

Handling and Storage

Storage

The packaging of *Kingspan* **Kool**therm® should not be considered adequate for long term outdoor protection. Ideally boards should be stored inside a building. If, however, outdoor storage cannot be avoided then the boards should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin. Boards that have been allowed to get wet should not be used.

Resistance to Solvents

The insulation core is resistant to short–term contact with petrol and with most dilute acids, alkalis and mineral oils. However, it is recommended that any spills be cleaned off fully before the boards are installed. Ensure that safe methods of cleaning are used, as recommended by suppliers of the spilt liquid. The insulation core is not resistant to some solvent-based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with this product. Damaged boards or boards that have been in contact with harsh solvents or acids should not be used.

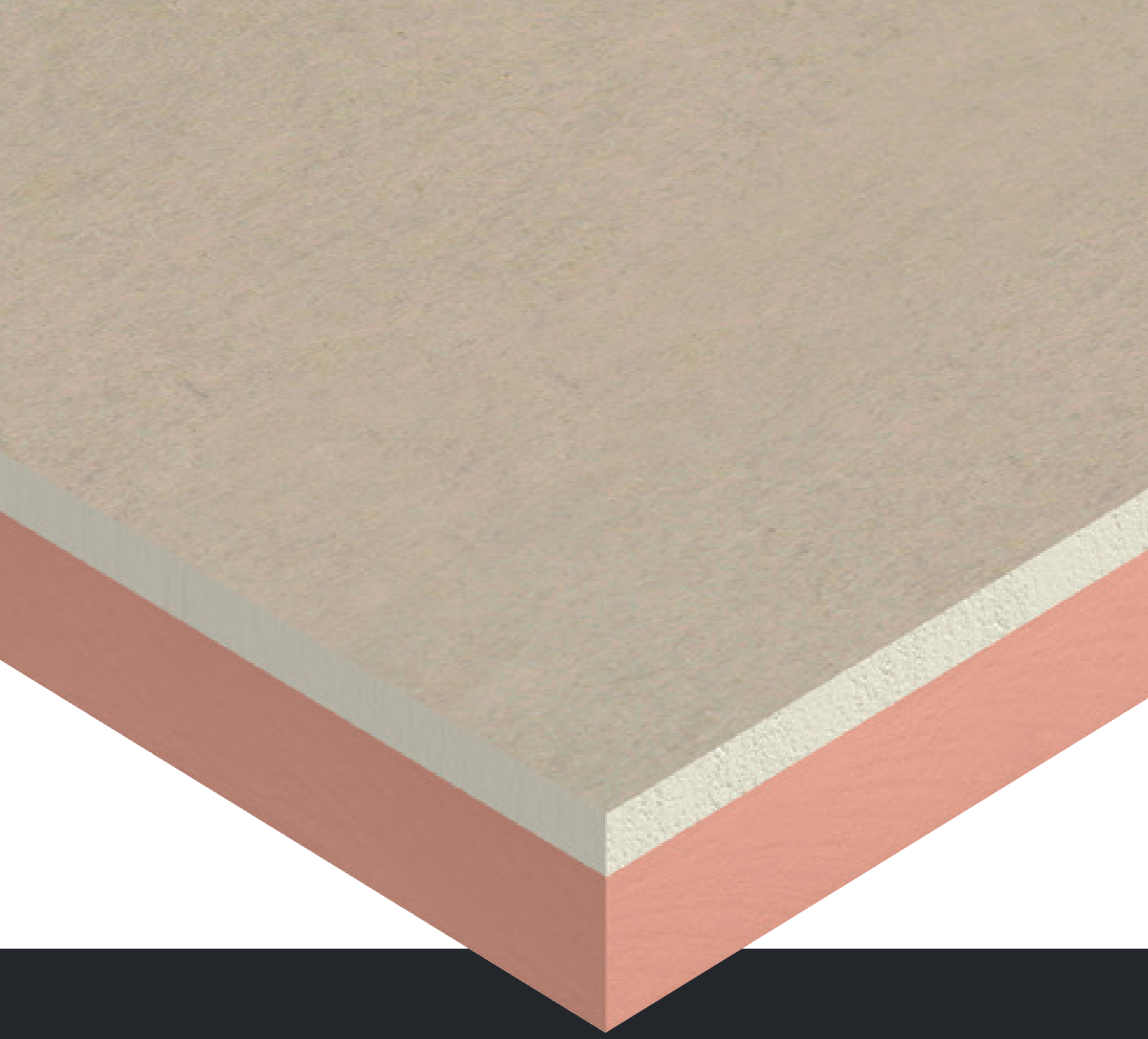
OH & S

Kingspan Insulation products are chemically inert and safe to use. A Product Safety Information sheet is available from Kingspan Insulation Pty Ltd.

Please note that the reflective surfaces on this product are designed to enhance their thermal performance. As such, they will reflect light as well as heat, including ultraviolet light. Therefore, if these boards are being installed during bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles and if the skin is exposed for a significant period of time, to protect bare skin with a UV block sun cream.

Foil facings are conductive to electricity - avoid contact with un-insulated electrical cables and fittings.

Installation must be in accordance with AS 3999 *Bulk Thermal Insulation Installation* and AS 3000 *Electrical Installations* (Wiring Rules).



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