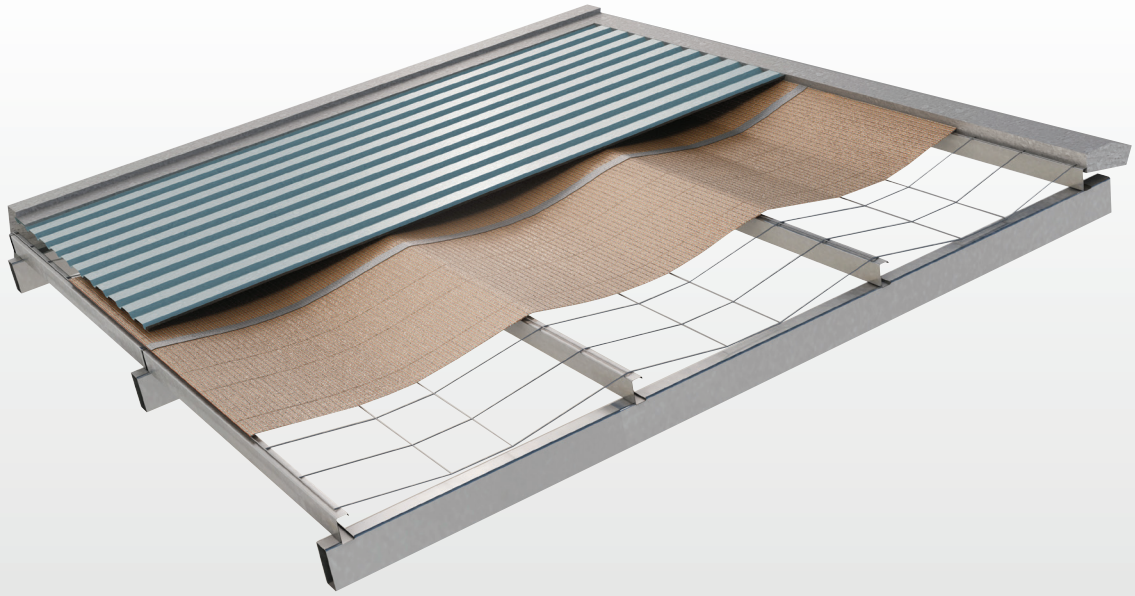
A4/8 KIAU0066
Issue 1 Apr 2020

AIR-CELL Insuliner®

REFLECTIVE INSULATION FOR USE WHERE IT ACTS AS THE WALL OR CEILING LINING



- Group 2 NZBC C/VM2 App. A fire classification
- Designed for warehouses and commercial or industrial sheds where the insulation acts as the wall or ceiling lining
- 3-in-1 Insulation, vapour barrier and radiant barrier
- Quick and easy to install
- Class 0 fire rating
- Strong, tough, durable
- Water-resistant and unaffected by moisture
- Rodent and insect resistant
- Flammability Index ≤ 5
- AS/NZS 4859.1 compliant
- CodeMark-certified for Australian Building Code compliance

CodeMark® Australia Certificate CM20145

Fibre-free Core

GROUP 2 NZBC C/VM2 Appendix A

Kingspan®

Low Energy – Low Carbon Buildings

Commercial Metal Deck Roof

Typical Design Detail

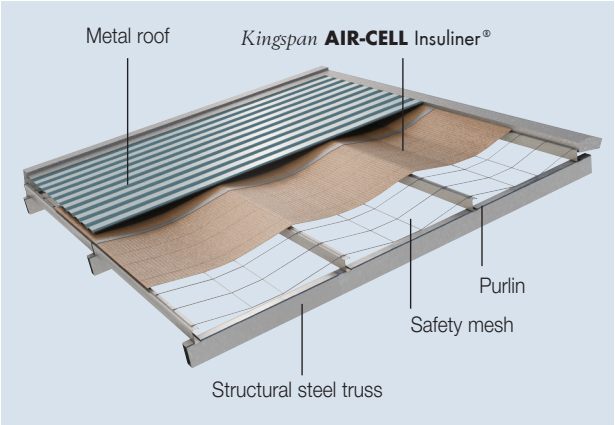


Figure 1 Warehouse metal deck roof installation

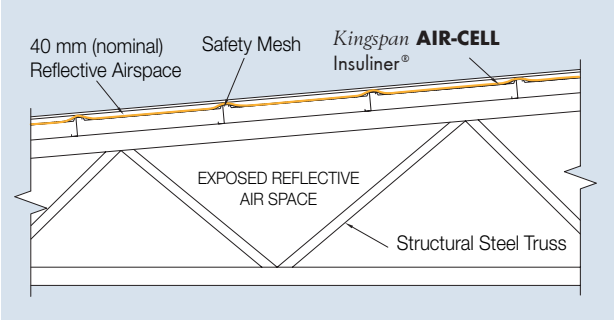


Figure 2 Side elevation of *Kingspan* **AIR-CELL** Insuliner® in a warehouse metal deck roof

Thermal Performance

Application	Heat flow in	Heat flow out
Warehouse metal deck roof	R_T1.1	R_T0.7

The R-values shown are Total R-values for the building element and are calculated in accordance with NZS 4214 as required by Verification Method H1/VM1 Clause 1.4.1 and Acceptable Solution H1/AS1 Clause 2.3.1.

Specification Guide

The roof insulation installed over the purlins shall be classified as Group 2 in accordance with NZBC C/VM2 Appendix A fire classification for wall and ceiling linings and shall be *Kingspan* **AIR-CELL** Insuliner® fibre-free, thermo reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched with an anti-glare foil facing on one side and a plain foil facing on the other side manufactured by Kingspan Insulation, and shall be installed in accordance with the instructions issued by them.

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

Installation Instructions

1. Lay *Kingspan* **AIR-CELL** Insuliner® perpendicular to purlins ensuring a 50 mm overlap into the gutter.
2. Allow a nominal 40 mm sag between purlins. If mesh is used, ensure that the mesh is installed loosely to allow for this sag.
3. Overlap by 50 mm at joins and apply minimum 72 mm wide Kingspan reinforced aluminium insulation tape to top of join. Alternatively allow 150 mm overlap when joins are not to be taped (please refer to brochure “Kingspan Insulation Tape” for further information).
4. End joins should be overlapped by 600 mm if not taped.
5. Fix roof sheeting by screwing through *Kingspan* **AIR-CELL** Insuliner® to the purlins.

Scan to see the installation video

Commercial Metal Deck Roof Retrofit

Typical Design Detail

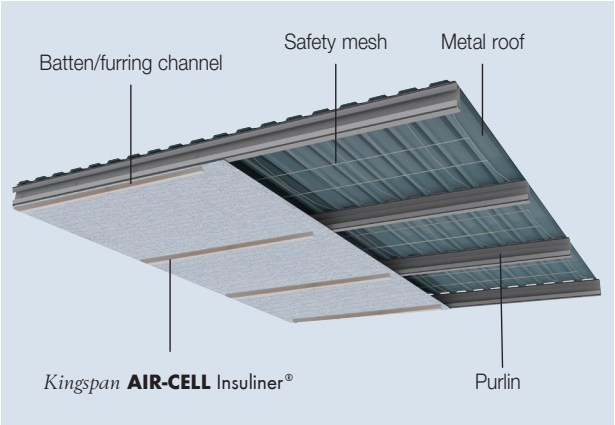


Figure 3 Warehouse metal deck roof retrofit installation

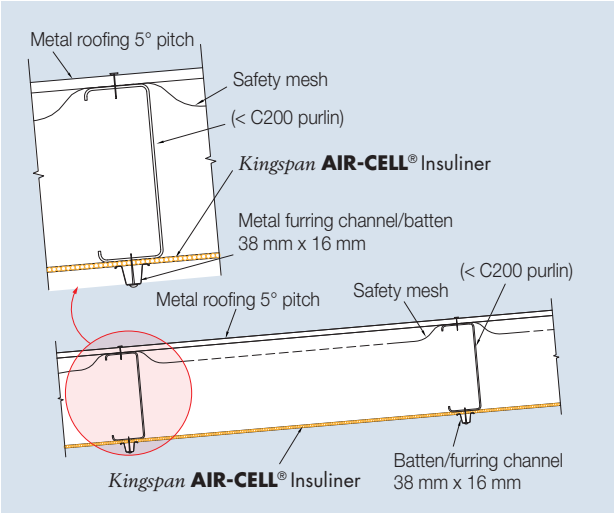


Figure 4 Side elevation of *Kingspan* **AIR-CELL** Insuliner® in a warehouse metal deck roof retrofit

Thermal Performance		
Application	Heat flow in	Heat flow out
Warehouse metal deck roof retrofit	R_T1.5	R_T0.7

The R-values shown are Total R-values for the building element and are calculated in accordance with NZS 4214 as required by Verification Method H1/VM1 Clause 1.4.1 and Acceptable Solution H1/AS1 Clause 2.3.1.

Specification Guide

The roof insulation installed to the underside of the purlins shall be classified as Group 2 in accordance with NZBC C/VM2 Appendix A fire classification for wall and ceiling linings and shall be *Kingspan* **AIR-CELL** Insuliner® fibre-free, thermo reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched with an anti-glare foil facing on one side and a plain foil facing on the other side manufactured by Kingspan Insulation, and shall be installed in accordance with the instructions issued by them.

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

Installation Instructions

1. *Kingspan* **AIR-CELL** Insuliner® should be applied to the underside of purlins by rolling out perpendicular to the purlin.
2. Attach end of insulation roll to end fixing point using three 12 gauge Tek screws or similar as an interim fixing (normally fixed to the underside of a purlin).
3. *Kingspan* **AIR-CELL** Insuliner® should be kept taut and wrinkle free between purlins.
4. Ensure a 50 mm clearance between insulation and heat producing items such as hot flues, light fittings and transformers.
5. Continue fixing to the underside of the purlins using interim fixings as for end point above.
6. Join subsequent alongside rolls by butt joining and tape joint with minimum 72 mm wide Kingspan reinforced aluminium insulation tape (please refer to brochure “Kingspan Insulation Tape” for further information). If taping is not required, overlap side joints by 150 mm. If the insulation is required to act as a water vapour barrier then the joints should be taped.
7. End joints should be overlapped and fixed at a purlin and taped with minimum 72 mm wide Kingspan reinforced aluminium insulation tape.
8. Fix a steel furring channel, top hat or similar of approx. 38 mm x 16 mm over *Kingspan* **AIR-CELL** Insuliner® to the bottom of the purlins using 4 fixings across the width of the insulation, to cover the preliminary fixings and secure the insulation.
9. If both roof and walls are installed with *Kingspan* **AIR-CELL** Insuliner® the roof and wall insulation should join to form a continuous thermal barrier and water vapour barrier if required.

Warehouse Wall

Typical Design Detail

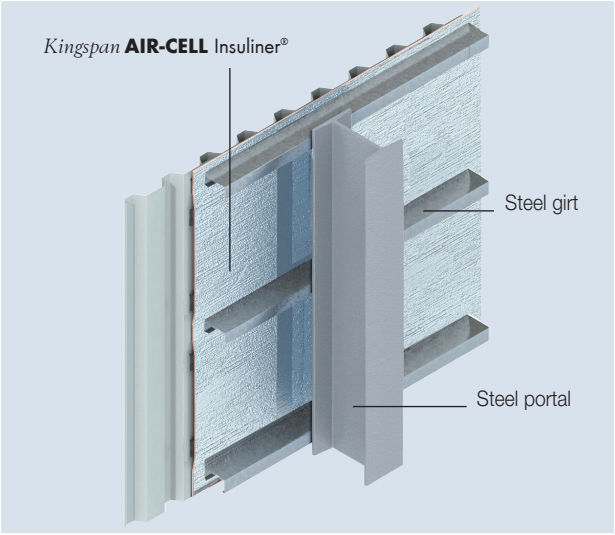


Figure 5 Warehouse wall installation

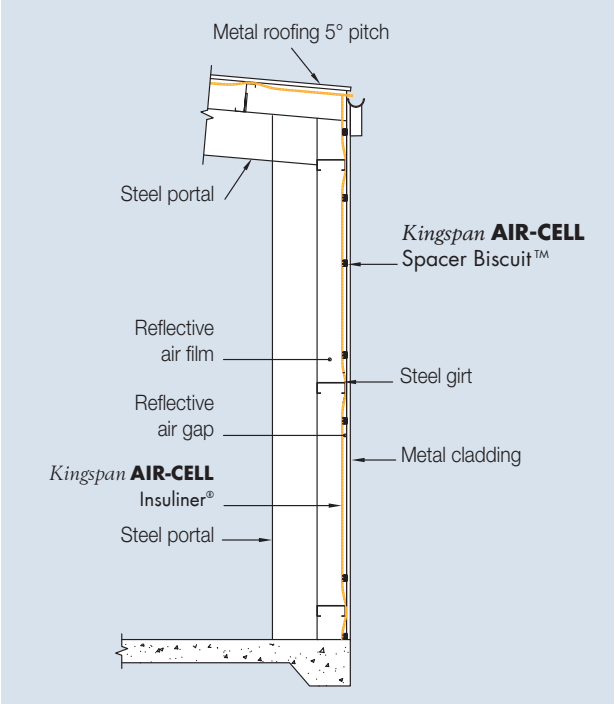


Figure 6 Side elevation of *Kingspan* **AIR-CELL** Insuliner® in a warehouse wall

Thermal Performance

Application	Heat flow in	Heat flow out
Warehouse metal clad wall	R_T 0.8	R_T 0.8

The R-values shown are Total R-values for the building element and are calculated in accordance with NZS 4214 as required by Verification Method H1/VM1 Clause 1.4.1 and Acceptable Solution H1/AS1 Clause 2.3.1.

Specification Guide

The wall insulation fixed to outside of the girts shall be classified as Group 2 in accordance with NZBC C/VM2 Appendix A fire classification for wall and ceiling linings and shall be *Kingspan* **AIR-CELL** Insuliner® fibre-free, thermo reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched with an anti-glare foil facing on one side and a plain foil facing on the other side manufactured by Kingspan Insulation, and shall be installed in accordance with the instructions issued by them.

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

Installation Instructions

1. Fix *Kingspan* **AIR-CELL** Insuliner® loosely to the outside of the frame leaving flexibility for the insulation to be dished between the frame members.
2. Cut *Kingspan* **AIR-CELL** Insuliner® carefully around the windows, doors and other openings, so that it neatly abuts to the frame.
3. For neatest finish, butt join sheets, alternatively overlap by 50 mm and tape with minimum 72 mm wide Kingspan reinforced aluminium insulation tape (please refer to brochure “Kingspan Insulation Tape” for further information).
4. Provide an outer air space by adhering the *Kingspan* **AIR-CELL** Spacer Biscuits™ to the outer face of the *Kingspan* **AIR-CELL** Insuliner® (approximately three Biscuits™ per square meter are required).
5. Fix outer cladding.

Warehouse Wall Retrofit

Typical Design Detail

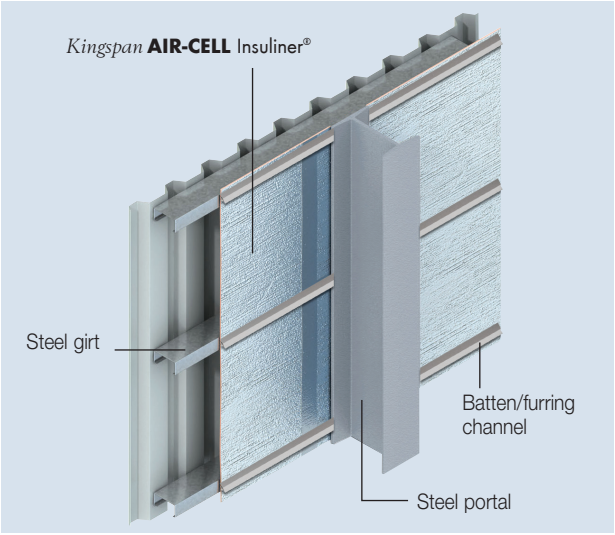


Figure 7 Warehouse wall retrofit installation

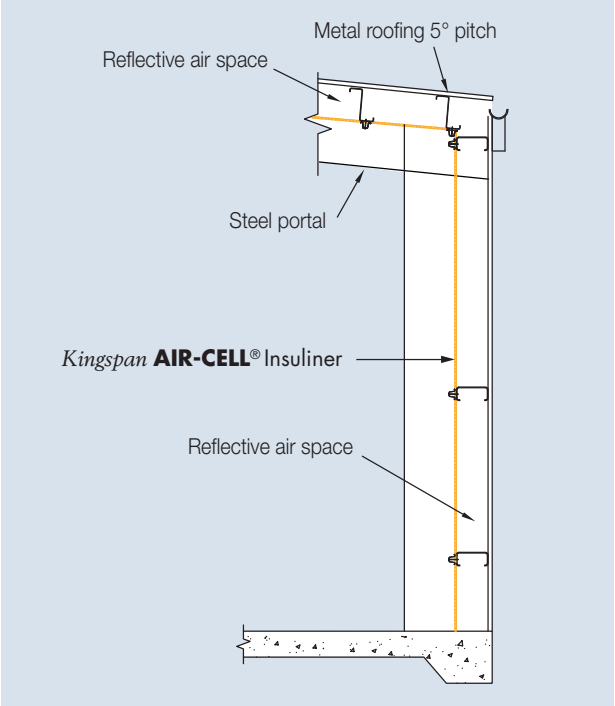


Figure 8 Side elevation of *Kingspan* **AIR-CELL** Insuliner® in a warehouse wall retrofit

Thermal Performance

Application	Heat flow in	Heat flow out
Warehouse metal clad wall retrofit	R_T 0.9	R_T 0.8

The R-values shown are Total R-values for the building element and are calculated in accordance with NZS 4214 as required by Verification Method H1/VM1 Clause 1.4.1 and Acceptable Solution H1/AS1 Clause 2.3.1.

Specification Guide

The wall insulation fixed to the inside of the girts shall be classified as Group 2 in accordance with NZBC C/VM2 Appendix A fire classification for wall and ceiling linings and shall be *Kingspan* **AIR-CELL** Insuliner® fibre-free, thermo reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched with an anti-glare foil facing on one side and a plain foil facing on the other side manufactured by Kingspan Insulation, and shall be installed in accordance with the instructions issued by them.

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

Installation Instructions

1. Fix *Kingspan* **AIR-CELL** Insuliner® should be applied to the inside of girts, by rolling out perpendicular to the girt.
2. Attach end of insulation roll to end fixing point using three 12 gauge Tek screws or similar as an interim fixing (normally fixed to the inside of girt).
3. *Kingspan* **AIR-CELL** Insuliner® should be kept taut and wrinkle free between girts.
4. Ensure a 50 mm clearance between insulation and heat producing items such as hot flues, light fittings and transformers.
5. Continue fixing to the inside of girts, using interim fixings as for end point above.
6. Join subsequent alongside rolls by butt joining and tape joint with minimum 72 mm wide Kingspan reinforced aluminium insulation tape (please refer to brochure “Kingspan Insulation Tape” for further information). If taping is not required, overlap side joints by 150 mm. If the Insuliner is required to act as a water vapour barrier then the joints should be taped.
7. End joints should be overlapped and fixed at a girt, and taped with minimum 72 mm wide Kingspan reinforced aluminium insulation tape.
8. Fix a steel furring channel, top hat or similar of approx. 38 mm x 16 mm over the *Kingspan* **AIR-CELL** Insuliner® to the inside of girts, using 4 fixings across the width of the insulation, to cover the preliminary fixings and secure the insulation.
9. If both roof and walls are installed with *Kingspan* **AIR-CELL** Insuliner® the roof and wall insulation should join to form a continuous thermal barrier, and water vapour barrier if required.

Product Details

Product Description

Australian-made *Kingspan* **AIR-CELL** Insuliner® is the latest in thermo reflective insulation technology with the most advanced fire performance characteristics, achieving a Group 2 classification to NZBC C/VM2 Appendix A fire ratings for wall and ceiling linings. *Kingspan* **AIR-CELL** Insuliner® comprises a cross-linked, closed-cell insulation core sandwiched by highly reflective foil facings.

Product Data	
Product Code	TB055G2
Product Thickness	5.5 mm
Product R-Value	R0.16
Roll Diameter	400 mm
Roll Weight	9 kg
Roll Size	1350 mm x 22.25 m (30 m²)
Reflectance	
Anti-Glare Face	95%
Reflective Face	97%
Emittance	
Anti-Glare Face	E0.05
Reflective Face	E0.03
Max Unsupported Span	2400mm

Figure 9 Physically cross-linked *Kingspan* **AIR-CELL** Insuliner®

Management Standards

Standard	Management System
ISO 9001:2015	Quality Management
ISO 14001:2015	Evironmental Management
OHSAS 18001:2007	Occupational Health & Safety Management

Fire Performance

Characteristic	Standard	Classification
NZBC Group Number	ISO 9705	Group 2
Flammability Index	AS 1530.2	≤ 5
Fire Propagation	BS 476 Part 6	Class 0
Surface Spread of Flame	BS 476 Part 7	Class 1
Surface Burning	UL 723	Class A

Product Specifications

Characteristic	Test Method / Standard	Specification
Material Thermal Resistance	ASTMC518	R0.16 m²·K/W
Emittance	ASTM-E408	Anti-Glare E0.05 Reflective E0.03
Burst Force	AS 3706.4	0.7 kN
Dry Delamination	AS/NZS 4201.1	Pass
Wet Delamination	AS/NZS 4201.2	Pass
Shrinkage	AS/NZS 4201.3	Pass
Water Barrier	AS/NZS 4201.4	High Resistance
Water Absorbency	AS/NZS 4201.6	Unclassified
Corrosion Resistance	AS/NZS 4859.1 Appendix I	Pass
Vapour Barrier	ASTM E96	High Resistance

New Zealand Building Code (NZBC) Requirements for Internal Surface Lining

According to the NZBC, any material used as an internal surface lining must have a Group Number Classification as defined by the NZBC C/VM2 Appendix A. A Group 1 Classification is the highest possible level. This includes reflective insulation products which are used in buildings such as warehouses and commercial or industrial sheds where internal wall and ceiling linings are typically not applied. In these applications, the insulation material itself is considered the lining material, and must therefore have a Group Number classification.

For materials which have reflective surfaces, such as reflective insulation, and materials that melt and shrink away from a flame, the NZBC requires an ISO 9705 full scale fire test to be undertaken to determine a Group Number.

What does Group 2 mean?

In New Zealand, a material achieving a Group 2 fire performance classification can be used in most areas of buildings apart from a number of un-sprinklered areas, such as exitways and occupied spaces in level 4 buildings. The complete list can be found in NZBC Clause C3.

A material with a Group 2 fire rating exceeds the performance level of a Class 0 material and will have better fire performance.

Other Information

General Requirements

1. Fit *Kingspan* **AIR-CELL®** neatly around doors, windows, and any penetrations, and tape if necessary to prevent air leakage.
2. When taping a plastic squeegee or blade must be used to apply appropriate pressure to the tape. Surfaces must be dry and free from dust, oil or grease prior to taping (please refer to brochure 'Kingspan Insulation Tape' for further information).
3. Leave minimum 50 mm clearance around heat producing flues or light fittings (refer to light fitting manufacturer).

These instructions are guidelines only and should be interpreted with consideration for the specific building design. The installation of *Kingspan* **AIR-CELL®** should be in conformance with the applicable clauses from AS 3999 and AS/NZS 4200.2 unless otherwise specified.

Kingspan **AIR-CELL®** can be damaged by intense heat above 105° C and contact with sparks and flame from blow torches, welders, cutting tools, etc. must be avoided.

The installer must make due provision for safety when installing *Kingspan* **AIR-CELL®** in any application.

Safety Information

- Non-hazardous/non-toxic.
- No personal protective equipment required.
- UV protective sunglasses and screen should be used when installing in direct sunlight.
- Ensure at least 50 mm clearance from hot flues and light fittings (check for safe distance with lighting supplier).
- **Foil facings are conductive to electricity – avoid contact with un-insulated electrical cables and fittings.**

Handling and Storage

Kingspan **AIR-CELL®** insulation products must be transported and stored in its protective packaging and kept clean and dry. Standing rolls on end reduces risk of damage should moisture be present in the packaging. Surfaces must be kept free of contaminants such as dust and grease, and must not be stored with foil surfaces in contact with alkaline materials i.e. wet cement, lime, etc.

Contact Details

General Enquiries

Tel: 0800 1 23 23 1
Email: info@kingspaninsulation.co.nz

Kingspan Insulation Pty Ltd
Tel: 0800 1 23 23 1
Email: info@kingspaninsulation.co.nz

www.kingspaninsulation.co.nz