

0471P KINGSPAN IN THERMAL INSULATION AND PLIABLE MEMBRANES

Branded worksection

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Worksection abstract

This branded worksection *Template* is applicable to KINGSPAN insulation and pliable membranes for floors, walls, ceilings and roofs. It generally relies on AS 3999, AS/NZS 4200.1, AS 4200.2 and AS/NZS 4859.1. A pliable building membrane may be installed to act as a sarking membrane, vapour barrier, thermal insulation or any combination of the three. This worksection does not cover insulation for services (e.g. for ductwork, use *0744 Ductwork insulation*).

Background

See the NATSPEC TECHnote DES 004 and the non-mandatory *ABCB Condensation in buildings* handbook for information relating to the use of insulation and vapour barriers to reduce condensation and moisture flow. See NATSPEC TECHnote DES 015 for information on the BCA energy efficiency provisions.

Guidance text

All text within these boxes is provided as guidance for developing this worksection and should not form part of the final specification. This *Guidance* text may be hidden or deleted from the document using the NATSPEC Toolbar or the hidden text *Hide* and *Delete* functions of your word processing system. For additional information visit FAQs at www.natspec.com.au.

Optional style text

Text in this font (blue with a grey background) covers items specified less frequently. It is provided for incorporation into *Normal* style text where it is applicable to a project.

Related material located elsewhere in NATSPEC

If a listed worksection is not part of your subscription package and you wish to purchase it, contact NATSPEC.

Related material may be found in other worksections. See for example:

- *0411 Waterproofing – external and tanking.*
- *0421 Roofing – combined.*
- *0423p KINGSPAN insulated panel roofing systems.*
- *0431 Cladding – combined.*
- *0437p KINGSPAN insulated panel cladding systems.*
- *0522 Partitions – framed and lined.*
- *0531 Suspended ceilings – combined.*
- *0621 Waterproofing – wet areas.*
- *0744 Ductwork insulation* for thermal insulation and sheathing of ductwork.

Material not provided by KINGSPAN

This branded worksection includes generic material which may not be provided by the Product Partner including:

- Fibre batts.
- Vapour permeable (breathable) membranes.

Documenting this and related work

You may document this and related work as follows:

- Show on the drawings the extent, type, location, arrangement, fixing and support details of all insulation and pliable membranes.
- Insulation and pliable membranes may be integral to other worksections. Cross reference from related worksections to this worksection or take relevant text from here for inclusion in those worksections.

The *Normal* style text of this worksection may refer to items as being documented elsewhere in the contract documentation. Make sure they are documented.

Search acumen.architecture.com.au, the Australian Institute of Architects' practice advisory subscription service, for notes on the following:

- Guarantees and warranties.

Specifying ESD

The following may be specified by retaining default text:

- Framed wall thermal break strips.

The following may be specified using included options:

- Thermal performance to reduce heating/cooling load by specifying the required R-Value for roof/ceiling, walls and floors.

The following may be specified by including additional text:

- Recycled material content, e.g. recycled waste glass in glass wool insulation.

Refer to the NATSPEC TECHreport TR 01 on specifying ESD.

1 GENERAL

Kingspan Insulation is a world-leading manufacturer of innovative, high performance insulation products for roof, wall and underfloor applications in residential and commercial buildings which help reduce the carbon footprint of the built environment. Kingspan Insulation manufactures AIR-CELL®, the region's leading thermo-reflective insulation brand and Kooltherm®, a world-leading CFC/HCFC-free rigid thermoset insulation with zero Ozone Depletion Potential (ODP).

Kingspan Insulation's technical experts can provide thermal solutions for Section J, Green Star and 6 Stars.

www.kingspaninsulation.com.au

1.1 RESPONSIBILITIES

General

Requirement: Provide KINGSPAN insulation and pliable membrane systems, as documented.

Documented is defined in 0171 General requirements as meaning contained in the contract documents.

It is the responsibility of the designer to nominate and detail insulation and pliable membranes conforming to the requirements of the BCA.

Performance

Requirements:

- Complete for their function.
- Conforming to the detail and location drawings.
- Firmly fixed in position.

1.2 COMPANY CONTACTS

KINGSPAN technical contacts

Website: www.kingspaninsulation.com.au/Contact-Us/Enquiry

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

0171 General requirements contains umbrella requirements for all building and services worksections.

List the worksections cross referenced by this worksection. 0171 General requirements references the 018 Common requirements subgroup of worksections. It is not necessary to repeat them here. However, you may also wish to direct the contractor to other worksections where there may be work that is closely associated with this work.

NATSPEC uses generic worksection titles, whether or not there are branded equivalents. If you use a branded worksection, change the cross reference here.

1.4 MANUFACTURER'S DOCUMENTS

Technical manuals

Application and Installation guides, Product brochures, CAD drawings and Certificates & Warranties: www.kingspan.com/au/insulation/downloads.

1.5 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- FBS-1 (fibre-bio-soluble) mineral wool: Insulation composed of bio-soluble glass or rock fibres.

- Fibre batts: Flexible insulation supplied as factory cut pieces and composed of mineral wool (glass and rock fibre) or polyester fibre.
- Fire hazard properties: To BCA A2.4.

This includes the Average specific extinction area, Critical radiant flux, Flammability Index, Smoke-Developed Index, Smoke growth rate index, Smoke development rate or Spread-of-Flame Index of a material or assembly as applicable.

See NATSPEC TECHnote DES 003 for more information on fire hazard properties of insulation and pliable membranes.

This includes the Flammability Index, Smoke-Developed Index and the Spread-of-Flame Index of a material or assembly as applicable.

See NATSPEC TECHnote DES 003 for more information on fire hazard properties of insulation and pliable membranes and NATSPEC TECHnote DES 020 for fire behaviour of building materials and assemblies.

- Pliable building membrane: To AS/NZS 4200.1 and equivalent to sarking-type materials as defined in the BCA.

A pliable building membrane may be installed to act as a sarking membrane, vapour barrier, thermal insulation or any combination of the three. The BCA cites AS/NZS 4200.1:1994.

- Thermal insulation terminology: To AS/NZS 4859.1.

AS/NZS 4859.1 relies on ASTM C168 for definitions with some qualifications and some additional definitions and in the NOTE to AS/NZS 4859.1 clause 1.5.1 offers ISO 9229 for additional information.

- Vapour permeable (breathable) membrane: A flexible membrane material, normally used for secondary waterproofing that allows for the transmission of water vapour.

Edit the **Definitions** subclause to suit the project or delete, if not required. List alphabetically.

1.6 SUBMISSIONS

Certification

Certification: Required.

Refer to KINGSPAN for CodeMark certification and FM Global approvals and evidence of zero ozone depletion potential and zero CFC/HCFC conformance.

Certification provider: An organisation accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

Delete materials which are not applicable to the project.

Fire performance

Fire hazard properties: Submit evidence of conformance to PRODUCTS, **FIRE PERFORMANCE**, **Fire hazard properties**.

Products and materials

Thermal insulation properties: Submit evidence of conformance to AS/NZS 4859.1.

This is primarily to verify claimed Total R-Value for BCA compliance. For calculated values it is important that the calculations comply with AS/NZS 4859.1 including de-rating in Normative Appendix K. See NATSPEC TECHnote DES 031 for information on specifying R-Values.

Warranties

Kingspan Insulation published product warranties: Submit on completion.

Describe the requirements of warranties in **EXECUTION**, as appropriate, and list the submissions required here.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the pliable membrane and insulation before they are covered up or concealed.

Amend to suit the project adding critical stage inspection required.

Hold points, if required, should be inserted here.

2 PRODUCTS

BCA J1.2 and BCA 3.12.1 nominate the minimum R-Values for roof, wall and floor construction in all climate zones.

2.1 GENERAL

Product substitution

Other products: Conform to PRODUCTS, **GENERAL, Substitutions** in 0171 General requirements.

The 0171 General requirements clause sets out the submissions required if the contractor proposes alternative products. Refer also to NATSPEC TECHnote GEN 006 for more information on proprietary specification.

Product identification

General: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.

Edit the list to suit the project or delete if not required.

2.2 FIRE PERFORMANCE

Fire hazard properties

See NATSPEC TECHnote DES 003 for more information on the fire hazard properties of insulation materials and NATSPEC TECHnote DES 020 on fire behaviour of building materials and assemblies. See also BCA Spec C1.10 Table 4.

Insulation: Tested to AS/NZS 1530.3. Fire hazard indices, as follows:

- Spread-of-Flame Index: ≤ 9 .
- Smoke-Developed Index: ≤ 8 if Spread-of-Flame Index > 5 .
- Materials with reflective facing: Test to AS/NZS 1530.3 and the recommendations of Appendix A6.

AS/NZS 1530.3 Informative Appendix clause A6 recommends that reflective surfaces of test specimens (which would otherwise generally pass this test) be blackened and diagonally scored in order to simulate soot deposition onto reflective surfaces in a real fire situation. Note that AS/NZS 1530.3 clause 4.12.2(c) requires insulation materials faced with reflective surface materials to incorporate a representative vertical joint in three test specimens.

Pliable membranes: Tested to AS 1530.2: Flammability index ≤ 5 .

Flammability Index is determined under AS 1530.2. There has been some debate about the adequacy of the test procedure in predicting performance of material in real fire situations. Pliable membranes are tested to AS 1530.2 as they are not suitable for testing to AS/NZS 1530.3.

Exposed insulation/linings:

- Group number: To BCA Spec C1.10 and AS 5637.1.

Group number: Refer to BCA Spec C1.10 Table 3 which has *group number* requirements for wall and ceiling linings. Materials used as a finish, surface, lining, or attachment to an internal wall or ceiling must be a Group 1, 2 or 3 material used in conformance with BCA Spec C1.10 Table 3.

Non-sprinklered buildings: Wall and ceiling linings must either have an *average specific extinction area* less than $250 \text{ m}^2/\text{kg}$ or a *smoke growth rate index* not more than 100 as determined by AS 5637.1.

Refer to NATSPEC TECHnote DES 020 for information on fire hazard properties.

Non-combustible construction required: [complete/delete]

List any parts of the project that the BCA requires to be non-combustible. Delete if none. Construction required to be non-combustible by the BCA (e.g. fire walls and spandrels with a specific FRL) must be constructed wholly of materials that are not deemed combustible. In other situations the BCA does not prohibit the use of combustible insulation materials, provided they meet the other fire properties.

2.3 INSULATION AND PLIABLE MEMBRANE MATERIALS

Insulation

Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 5.

Mineral wool blankets and cut pieces: To AS/NZS 4859.1 Section 8.

Phenolic foam (rigid cellular board): To AS/NZS 4859.1.

Polyester: To AS/NZS 4859.1 Section 7.

Polyisocyanurate (rigid cellular RC/PIR): To AS 1366.2.

Polystyrene (extruded rigid cellular RC/PS-E): To AS 1366.4.

Polystyrene (moulded rigid cellular RC/PS-M): To AS 1366.3.

Polyurethane (rigid cellular RC/PUR): To AS 1366.1.

The rigid cellular sheets listed exhibit high combustibility (as do most of the organic fibre materials) and release various toxic products of combustion (e.g. hydrogen cyanide from polyurethane foam). Other alternatives include strawboard and woodwool.

Polyurethane (sprayed): To ASTM D6694/D6694M.

Wet processed fibreboard (including softboard): To AS/NZS 1859.4.

Wool: To AS/NZS 4859.1 Section 6.

Reflective thermal insulation: To AS/NZS 4859.1 Section 9.

AS/NZS 4859.1 Normative Appendix K sets out the assumptions to be used when calculating the system and Total R-Values of building construction that incorporates reflective surfaces. It sets out the indoor and outdoor temperatures to be used and requires de-rating of the insulation effect of reflective surfaces to compensate for dust, labelling ink and so on. The effect of the de-rating may be significant and in situations where reflective foil is used in combination with bulk insulation, a conservative approach would be to ignore the reflective surface effect, i.e. treat the surface as high emittance.

Pliable membranes

Standard: To AS/NZS 4200.1.

Where optional material classifications are required, AS/NZS 4200.1 Appendix A sets out tests for resistance to UV exposure, surface corrosion of low emittance surface, heat shrinkage, surface water absorbency classification and air control classification. Contact manufacturer's for the availability of these test results.

Vapour barrier:

- Vapour control classification: Class 1.

AS/NZS 4200.1 defines the classifications for vapour control membranes (VCM) as Class 1, Class 2, Class 3 or Class 4.

Sarking membrane (other than walls and gables):

- Water control classification: Water barrier.

If the water control membrane (sarking) fails the test documented in or has not been tested to AS/NZS 4201.4, the classification is Non-water barrier.

Vapour permeable (breathable) membrane: Minimum Class 4.

AS/NZS 4200.1 Table 4 documents minimum and maximum vapour permeance values ($\mu\text{g}/\text{N.s}$) for vapour control membranes. Vapour permeance is the inverse of vapour resistance (MN.s/g), the higher the permeance value, the greater the permeability.

Fasteners and supports

General: Metallic-coated steel.

KINGSPAN fasteners and supports: In conformance with KINGSPAN recommendations.

Consider nominating stainless steel in areas of high corrosivity.

Mesh support to roof insulation

Metallic-coated steel wire netting: To AS 2423 Section 4.

- Size: 45 mm mesh x 1 mm diameter.

This is not suitable for use as safety mesh for fall arrest. AS 2423 covers wire netting and chainwire and requires that all steel products be protected against corrosion by application of a metallic-coating during manufacture, optionally overlaid with an organic coating, see AS 2423 clause 1.3.13.

Welded safety mesh: To AS/NZS 4389.

Welded safety mesh may be used for fall arrest if required by WHS authorities. Coordinate with the *0421 Roofing – combined* worksection which also cites AS/NZS 4389. Mesh support for roof insulation may not be required where fall arrest sarking is used.

2.4 KINGSPAN INSULATION PRODUCTS

KINGSPAN Kooltherm® K3 floorboard

Description: Floorboard comprising a rigid thermoset phenolic insulation core with an upper tissue based facing and a lower facing of highly reflective aluminium foil. Suitable for solid concrete ground based floors.

Thickness: 25 mm, 30 mm, 40 mm, 50 mm.

Size: 1200 mm x 2400 mm

R-Value (at 23°C): R 1.2 (25 mm), R 1.4 (30 mm), R 1.9 (40 mm), R 2.5 (50 mm).

KINGSPAN Kooltherme® K5 external wall board

Description: External wall board comprising a rigid thermoset phenolic insulation core with a tissue based facing on both sides. Suitable for use behind traditional and lightweight polymer modified renders.

Thickness: 50 mm, 80 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.5 (50 mm), R 4.0 (80 mm).

Certification: CodeMark Certificate No. CM20044.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Kooltherm® K8 cavity board

Description: Cavity board comprising a rigid thermoset phenolic insulation core with two highly reflective aluminium foil facings. Suitable for cavity masonry applications.

Thickness: 25 mm, 40 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 514 mm.

R-Value (at 23°C): R 1.2 (25 mm), R 1.9 (40 mm).

Certification: CodeMark Certificate No. CM20042.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Kooltherm® K10 FM soffit board

Description: Soffit board comprising a rigid thermoset phenolic insulation core with a tissue based facing to upper side and a plain foil facing to lower side. Suitable for concrete soffit applications as an exposed or concealed lining.

Thickness: 25 mm, 30 mm, 40 mm, 50 mm, 60 mm, 70 mm, 80 mm, 90 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.5 (50 mm).

Certification: CodeMark Certificate No. CM20046.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Kooltherm® K10 white soffit board

Description: Soffit board comprising a rigid thermoset phenolic insulation core with an upper tissue based facing and a lower facing of white aluminium foil. Suitable for concrete soffit applications as an exposed lining.

Thickness: 25 mm, 30 mm, 40 mm, 50 mm, 60 mm, 70 mm, 80 mm, 90 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.5 (50 mm).

Certification: CodeMark Certificate No. CM20046.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Kooltherm® K10 PLUS soffit board

Description: Soffit board comprising a rigid thermoset phenolic insulation core with an front facing fibre cement sheet and a reverse tissue based facing. Suitable for concrete soffit applications as an exposed lining.

Refer to KINGSPAN for availability of other lining boards.

Thickness (including 6mm fibre cement sheet): 31 mm, 36 mm, 46 mm, 56 mm, 66 mm, 76 mm, 86 mm, 96 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.5 (56 mm).

KINGSPAN Kooltherm® K12 framing board

Description: Framing board comprising a rigid thermoset phenolic insulation core with two highly reflective aluminium foil facings. Suitable for cavity masonry, framed and concrete wall systems applications.

Thickness: 25 mm, 30 mm, 40 mm, 50 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.5 (50 mm).

Certification: CodeMark Certificate No. CM20047.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Kooltherm® K17 insulated plasterboard

Description: Insulated plasterboard comprising a rigid thermoset phenolic insulation core with plasterboard facing bonded to one side and tissue based facing to the other side. Suitable for solid wall applications.

Refer to KINGSPAN for availability of other lining boards.

Thickness (including 10 mm plasterboard): 35 mm, 40 mm, 50 mm, 60 mm, 70 mm, 80 mm, 90 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.0 (50 mm including 10mm plasterboard).

KINGSPAN Kooltherm® K18 insulated plasterboard

Description: Insulated plasterboard comprising a rigid thermoset phenolic insulation core with plasterboard facing bonded to one side and highly reflective aluminium facing to the other side. Suitable for framed wall applications.

Refer to KINGSPAN for availability of other lining boards.

Thickness (including 10mm plasterboard): 35 mm, 40 mm, 50 mm, 60 mm, 70 mm, 80 mm, 90 mm.

Refer to KINGSPAN for availability of other sizes.

Size: 1200 mm x 2400 mm.

R-Value (at 23°C): R 2.0 (50 mm including 10mm plasterboard).

Certification for Kooltherm® K17 and K18: CodeMark Certificate No. CM20045.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN AIR-CELL Insulbreak®

Description: Reflective insulation, vapour barrier and thermal break comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side. Suitable for roof, wall and floor applications.

Thickness: 6.5 mm, 8.0 mm.

Roll width: 1350 mm.

Thermal break: R0.20 (6.5 mm), R0.25 (8.0 mm).

KINGSPAN AIR-CELL Insuliner®

Description: Reflective insulation and vapour barrier comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side. Suitable for roof and wall applications.

Thickness: 5.5 mm.

Roll width: 1350 mm.

KINGSPAN AIR-CELL Insulwhite®

Description: Reflective insulation and vapour barrier comprising a cross-linked, closed-cell foam core sandwiched between a white facing on one side and a plain foil facing on the other side. Suitable for attic conversions.

Thickness: 5.5 mm.

Roll width: 1350 mm.

KINGSPAN AIR-CELL Permivac XV™

Description: Vapour permeable reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side. Suitable for wall applications.

Thickness: 5.5 mm.

Roll width: 1350 mm.

KINGSPAN AIR-CELL Permishield®

Description: Vapour permeable reflective insulation and thermal break, comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side. Suitable for wall applications.

Thickness: 6.5 mm, 8.0 mm.

Roll width: 1350 mm.

Thermal break: R0.20 (6.5 mm), R0.25 (8.0 mm).

KINGSPAN AIR-CELL Permifloor®

Description: Water permeable reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side.

Thickness: 4.0 mm.

Roll width: 1350 mm or 500 mm.

KINGSPAN AIR-CELL Permiwall®

Description: Vapour permeable reflective insulation, comprising a cross-linked, closed-cell foam core sandwiched between plain foil facings on both sides.

Thickness: 5.5 mm.

Roll width: 1350 mm.

KINGSPAN AIR-CELL Glareshield XL™

Description: Reflective insulation, and vapour barrier comprising a cross-linked, closed-cell foam core sandwiched between an anti-glare foil facing on one side and a plain foil facing on the other side.

Thickness: 5.5 mm.

Roll width: 1350 mm.

Certification for Insulbreak®, Insulwhite®, Permivac XV™, Permishield®, Permifloor®, Permiwall® and Glareshield XL™: CodeMark Certificate No. CM20029.

See CodeMark Certificate for conditions and limitations. See www.abcb.gov.au to check if the Certificate of Conformity is valid.

KINGSPAN Therma™ TR26 LPC/FM

Description: Fibre-free rigid thermoset insulation, faced on both sides with a low emissivity composite foil autohesively bonded to the insulation core.

Thickness: 50 mm, 60mm, 70 mm, 80mm, 85 mm, 90 mm, 95 mm, 100 mm, 105 mm, 110 mm, 115 mm, 120 mm.

Size: 2270 x 1200 mm.

KINGSPAN Therma™ TR27 LPC/FM

Description: Fibre-free rigid thermoset insulation, faced on both sides with a coated glass tissue autohesively bonded to the insulation core.

Thickness: 50 mm, 60mm, 70 mm, 80mm, 85 mm, 90 mm, 95 mm, 100 mm, 105 mm, 110 mm, 115 mm, 120 mm, 125 mm, 130 mm.

Size: 2270 x 1200 mm.

KINGSPAN Therma™ TT46 LPC/FM

Description: Tapered fibre-free rigid thermoset insulation, faced on both sides with a low emissivity composite foil autohesively bonded to the insulation core.

Thickness:

- For systems with a 1:30 and 1:40 fall: 50 mm minimum.
- For systems with a 1:60 and 1:80 fall: 25 mm minimum.
- For systems with a 1:120 fall: 30 mm minimum.

Size: 1200 x 1200 mm.

KINGSPAN Therma™ TT47 LPC/FM

Description: Tapered fibre-free rigid thermoset insulation, faced on both sides with a coated glass tissue autohesively bonded to the insulation core.

Thickness:

- For systems with a 1:30 and 1:40 fall: 50 mm minimum.
- For systems with a 1:60 and 1:80 fall: 25 mm minimum.
- For systems with a 1:120 fall: 30 mm minimum.

Size: 1200 x 1200 mm.

3 EXECUTION**3.1 GENERAL****Bulk and rigid insulation**

Installation: To AS 3999 and BCA J1.2.

AS 3999 includes vapour barriers used in conjunction with bulk insulation.

General: Firmly butt together fibre blankets or batts, with no gaps except as follows:

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 clause 4.5.
- Electrical cables: To AS 3999 clause 2.6.

The flow of electric current in cables generates heat which needs to dissipate to the surroundings. The insulation should not be installed to completely surround the cable.

Glass wool and rock wool insulation: Conform to the ICANZ Industry code of practice for the safe use of glass wool and rock wool insulation *Industry Code of Practice for the Safe Use of Glass Wool and Rock Wool Insulation*.

The ICANZ Industry code of practice for the safe use of glass wool and rock wool insulation *Industry Code of Practice for the Safe Use of Glass Wool and Rock Wool Insulation* has been jointly developed by AMWU, CFMEU, CEPU, and ICANZ (formerly FARIMA). Copies of the code are available from the respective unions, insulation manufacturers and ICANZ.

Marking: Deliver mineral wool products to site in packaging labelled FBS-1 BIOSOLUBLE INSULATION.

See the NATSPEC TECHnote PRO 002 for more information on FBS-1 labelling.

Pliable membrane

Installation: To AS 4200.2 and BCA J1.2 or BCA 3.12.1.1, as appropriate.

AS 4200.2 Table 2.6 documents the duty classification and allowable usage for the application and level of support. See the ABCB Condensation in buildings handbook for information on condensation and use of vapour barriers, vapour permeable membranes and sarking. The BCA cites AS/NZS 4200.2:1994.

3.2 FLOORS

The following covers general applications for floor insulation. Delete applications not required and add other applications, as appropriate. For pliable building membranes for framed floors, see AS 4200.2 clause 3.11.

Under suspended framed floors - bulk insulation

Product type: Fibre batts.

Batts: Fit tightly between framing members. If support is not otherwise provided, staple nylon twine to the framing and stretch tight.

AS 3999 gives some directives on fixing of insulation often deferring to the manufacturer's recommendations on the type and spacing of fixing devices. Preferably show fixing details on the drawings.

Under suspended framed floors - reflective insulation

Product type: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Permifloor® 500.
- KINGSPAN AIR-CELL Permifloor®.

Fixing: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation as follows:

- KINGSPAN AIR-CELL Permifloor® 500 installation between joists.
- KINGSPAN AIR-CELL Permifloor® installation over bearers and under joists.

Sarking membrane: If used as a sarking membrane, overlap joints by 50 mm and adhesive tape.

Over suspended framed floors

Product type: Rigid cellular extruded sheets.

Installation: [complete/delete]

Select from:

- Over sheet flooring and between battens supporting a final flooring finish.
- Over sheet flooring with battens supporting a final flooring finish at door thresholds only. Provide cross references to the flooring and adhesive system.

Below concrete slab on ground

Product type: KINGSPAN Kooltherm® K3 Floorboard.

Preparation: [complete/delete]

Sand blinding or working slab.

Laying pattern: Stretcher bond, with edges tightly butted.

Damp proof membrane: Lay under insulation.

Over concrete slab on ground

Product type: Rigid cellular extruded sheets.

Substrate preparation: Prepare substrates are as follows:

- Clean and remove of any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections.
- Voids and hollows more than 10 mm with abrupt edges: Fill with a cement:sand mix not stronger than the substrate or weaker than the bedding.

Laying pattern: Stretcher bond, with edges tightly butted.

Fixing: Adhesive fixed directly to the concrete floor slab.

Subsequent finishes: [complete/delete]

Note separation strip, screed and finish, as appropriate.

Under suspended concrete slab

Use where slab incorporates in-slab heating or the slab separates a conditioned space from an unconditioned space.

Product type: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Kooltherm® K10 FM Soffit Board.
- KINGSPAN Kooltherm® K10 White Soffit Board.
- KINGSPAN Kooltherm® K10 PLUS Soffit Board.

Fixing: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation under suspended concrete slabs as follows:

- Directly to concrete soffit.
- To timber battens.
- To proprietary grid systems.

Joints: Apply 96 mm reinforced foil tape to all joints.

Joints for Kooltherm® K10 PLUS Soffit Board: No taping required.

Soffit finish: [complete/delete]

Select a finish to provide the desired appearance if exposed to view or fire hazard properties if required.

3.3 WALLS

The following covers general applications for wall insulation. Delete applications not required and add other applications, as appropriate.

Framed wall thermal break strips

Product type: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Insulbreak® 65/80.
- KINGSPAN AIR-CELL Permishield® 65/80.

Application: To steel framing with lightweight external cladding.

R-value: ≥ 0.2 .

See BCA J1.5(c) and BCA 3.12.1.4(b).

Screw fixing: Button head screws at 1 m centres.

Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

Framed walls – bulk insulation

Product type: Fibre batts.

Batts: Friction fit between framing members. If other support is not provided, staple nylon twine to the framing and stretch tight.

AS 3999 gives some directives on fixing of insulation often deferring to the manufacturer's recommendations on the type and spacing of fixing devices. Preferably show fixing details on the drawings.

Reflective insulation to steel or timber framed walls– with internal lining

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Insulbreak® 65/80 (for steel framing).
- KINGSPAN AIR-CELL Permishield® 65 (for timber and steel framing).
- KINGSPAN AIR-CELL Insulbreak® 65/80 and KINGSPAN Kooltherm® K18 insulated plasterboard (for steel framing).
- KINGSPAN AIR-CELL Permishield® 65 and KINGSPAN Kooltherm® K18 insulated plasterboard (for timber and steel framing).

Application: To steel or timber framing.

Fixing: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to outside face of stud wall framing and insulated plasterboard lining for steel or timber framed walls.

Reflective insulation to steel or timber framed walls – with no internal lining

Product: KINGSPAN AIR-CELL Insuliner®.

Use this product when the reflective foil insulation is the internal lining.

Application: To steel or timber framing with no internal lining.

Fixing: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to outside face of stud wall framing and insulated plasterboard lining for steel or timber framed walls.

Full masonry – cavity outer skin walls

Product: KINGSPAN AIR-CELL Permicanv XV™.

Application: To the outer masonry skin.

Fixing: KINGSPAN AIR-CELL spacer biscuit™ on pre-installed wall ties.

Installation: Conform to KINGSPAN's installation guide recommendations. Do not bridge the cavity.

Refer to KINGSPAN design guide for information on installation of reflective cavity insulation.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation sheets.

Full masonry – cavity inner skin walls

Product: KINGSPAN Kooltherm® K8 cavity board.

Application: To the inner masonry skin.

Installation: Conform to KINGSPAN's installation guide recommendations. Do not bridge the cavity.

Refer to KINGSPAN design guide for information on installation of reflective cavity insulation.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation sheets.

If construction is required to be non-combustible, check BCA Spec C1.10.

Masonry veneer cavity walls

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Permivac XV™.
- KINGSPAN AIR-CELL GlareshieldXL™.
- KINGSPAN Kooltherm® K18 insulated plasterboard.
- KINGSPAN AIR-CELL Permivac XV™ and KINGSPAN Kooltherm® K18 insulated plasterboard.
- KINGSPAN AIR-CELL Glareshield XL™ and KINGSPAN Kooltherm® K18 insulated plasterboard.

Application: To steel or timber framing.

Installation: Conform to KINGSPAN's installation guide recommendations. Do not bridge the cavity.

Refer to KINGSPAN design guide for information on installation of reflective insulation to outside face of stud wall framing and insulated plasterboard lining for masonry veneer walls.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation sheets.

Reverse masonry veneer walls

Product: KINGSPAN AIR-CELL Permishield® 65.

Application: To battens on outer face of masonry skin.

Installation: Conform to KINGSPAN's design guide recommendations.

Refer to KINGSPAN design guides for information on installation of reflective insulation to outside face of masonry skin and under applied cladding using counter battens.

Masonry walls or concrete walls – internal face – rigid cellular board insulation

Product: KINGSPAN Kooltherm® K12 framing board or KINGSPAN Kooltherm® K17 Insulated Plasterboard.

Application: To internal face of inner masonry skin or concrete wall.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of insulated plasterboard lining to the inner face of masonry or concrete walls using adhesive method.

Masonry walls or Concrete walls – internal face – reflective insulation

Product: KINGSPAN AIR CELL Permiwall®.

Application: To battens or furring channels on inner face of masonry skin or concrete wall.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of insulated plasterboard lining to the inner face of masonry or concrete walls as follows:

- With a clip and channel system.
- With a counter batten system.

Masonry walls – external face

Product: KINGSPAN Kooltherm® K5 external wall board.

Application: To external face of masonry skin for applied render finishes.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of rigid cellular board insulation to the outside face of masonry walls for applied render finishes. Coordinate with 0611 Rendering and plastering worksection and confirm compatibility with the selected render finish.

Vapour permeable (breathable) membrane

The primary function of the membrane is to direct any water that may penetrate the cladding, masonry veneer or exterior finish to the outside of the structure and act as barrier to draughts, wind driven rain and dust. There must be adequate provision for the draining, absorption or diffusion of moisture so that moisture is not left trapped between the membrane and the external cladding.

If used as reflective thermal insulation, an air space adjacent to the reflective (low emittance) face is required.

See AS 4200.2 clause 3.7 for common requirements for walls and the ABCB Condensation in buildings handbook for information on condensation and use of vapour barriers, vapour permeable membranes and sarking.

Application: Provide a vapour permeable membrane behind external facing material which does not provide permanent weatherproofing or which may be subject to condensation forming on the internal face, including the following:

- Boards fixed vertically or diagonally.
- Boards or planks fixed in exposed locations where wind driven rain can penetrate the joints.
- Unpainted or unsealed cladding.
- Masonry veneer.

Installation: Run the vapour permeable membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull taut over the framing and fix to framing members. Seal across the wall cavity at the top.

Horizontal laps: At least 150 mm wide, lapped to make sure water is shed to the outer face of the membrane.

End or vertical overlaps laps: At least 150 mm wide made over framing.

Openings: Run the vapour permeable membrane over the openings and leave covered until windows and doors are installed. Cut the membrane on a 45° diagonal from each corner of the opening, fold the flaps inside and fix to the inside frame of the opening. If the membrane is used to provide a continuous air tight layer, seal all joints with pressure sensitive adhesive tape.

A complete water tight seal that maintains vapour permeability is achieved at penetrations by installation of a proprietary fabricated corner piece.

Fixing: Install as follows:

Consider nominating stainless steel in areas of high corrosivity.

- Timber frames: Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads.
- Steel or aluminium frames: Hex head screws, with either 20 mm diameter washers or through hardboard strips.
- Plywood: Alternatives:
 - . Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads at minimum 300 mm centres.
 - . Water based contact adhesive with a 50% adhesive cover.

3.4 ROOFS

The following covers general applications for roof insulation. Delete applications not required and add other applications, as appropriate. See also AS/NZS 4200.1 Section 3 for pliable membranes for roofing.

General

Location: The whole of the roof area including skylight shaft walls, except the following:

- Eaves, overhangs, skylights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches and carports.

Amend if insulation is required in semi-enclosed spaces (balconies, verandahs) or ancillary buildings (garages, workshops, carports etc.).

Mesh support to roof insulation

Welded safety mesh may be required by WHS authorities for fall arrest, along with perimeter guard rails. AS/NZS 4389, on welded safety mesh, is called up in the 0421 Roofing – combined worksection. Coordinate.

Locations: Provide support to the following:

- Sarking, vapour barrier or reflective thermal insulation membranes laid over roof framing members which are spaced at more than 900 mm centres.
- Blanket type thermal insulation laid over roof framing members as sound insulation to metal roofing.

Wire safety mesh: Lay over the roof framing allowing only natural mesh sag between members to suit the application. Staple to timber frame, wire to steel frame.

Installing welded safety mesh: To AS/NZS 4389.

Pliable membranes

See AS 4200.2 Section 3 for pliable membranes for roofing.

Sarking membrane:

- Location: Provide sarking under tile and shingle roofing.

AS 2050 specifies sarking requirements for tiled roofs and is cited in the BCA for structural sufficiency and weatherproofing.

See AS 3999 clause 5.2 on the installation of roof insulation.

If used as reflective thermal insulation, an air space adjacent to the reflective (low emittance) face is required.

Vapour barrier:

- Installation: Lay over the roof framing with sufficient sag to allow the bulk insulation to achieve its full thickness. Overlap all edges 150 mm and seal all joints with pressure sensitive adhesive tape.

Any separate bulk thermal insulation should be placed on the cold side of the vapour barrier.

Metal roofs – bulk insulation

Product: Fibre blankets or batts.

Installation:

- Batts: Fit tightly between framing members.
- Blanket for sound insulation: Install over the roof framing, reflective thermal insulation (if any), and mesh support, so that the blanket is in continuous contact with the underside of the metal roofing sheets.
- Combined blanket and reflective insulation: Lay facing reflective insulation face downwards over safety mesh.

Reflective foil insulation – metal roofs - with internal lining

Product: KINGSPAN AIR-CELL Insulbreak®.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to metal roofs for both residential and commercial applications.

Reflective foil insulation – metal roofs - with no internal lining

Product: KINGSPAN AIR-CELL Insuliner®.

Use this product when the reflective foil insulation is the internal lining.

Application: To steel framing with no internal lining board.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to metal roofs for both residential and commercial applications.

Reflective foil insulation – tiled roofs

Product: KINGSPAN AIR-CELL Glareshield XL™.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to tiled roofs for residential applications.

Concrete roof slab soffit

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Kooltherm® K10 FM Soffit Board.
- KINGSPAN Kooltherm® K10 White Soffit Board.
- KINGSPAN Kooltherm® K10 PLUS Soffit Board.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to concrete soffits.

Waterproof membrane roofs – IRMA/PMR types

Roofs with insulating membrane protection are also known as IRMA (inverted roof membrane assembly) or PMR (protective membrane roof). Delete if specified in 0411 Waterproofing – external and tanking.

Product type: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Thermal™ TR 26 LPC/FM.
- KINGSPAN Thermal™ TR 27 LPC/FM.
- KINGSPAN Thermal™ TR 46 LPC/FM.
- KINGSPAN Thermal™ TR 47 LPC/FM.

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation over concrete decks and metal decks both with or without a green roof covering.

Final finish: [complete/delete]

Specify a filter layer with 150 mm laps at right angles to the slope above the insulation boards, stone drainage layer, soil and planting in the appropriate worksections and nominate them in **CROSS REFERENCES, General**.

Cathedral ceiling insulation – metal roofing and roofing tiles

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Glareshield XV™ (for timber framed roofs).
- KINGSPAN AIR-CELL Insulbreak® 65 (for metal framed roofs).
- KINGSPAN Kooltherm® K18 insulated plasterboard (for either timber or metal framed roofs).
- KINGSPAN AIR-CELL Glareshield XL™ and KINGSPAN Kooltherm® K18 insulated plasterboard (for timber framed roofs).
- KINGSPAN AIR-CELL Insulbreak® 65 and KINGSPAN Kooltherm® K18 insulated plasterboard (for metal framed roofs).
- KINGSPAN AIR-CELL Insulwhite® (for either timber or metal framed roofs).

Installation: Conform to KINGSPAN's installation guide recommendations.

Refer to KINGSPAN design guide for information on installation of reflective insulation to metal and tiled roofs for residential applications.

Ceiling insulation – bulk insulation

Product type:

- Framed ceilings: Fibre batts.
- Suspended ceiling: Fibre blanket.

Application: Over ceiling lining.

Installation:

- Batt's: Fit tightly between framing members.
- Blankets: Butt joint and lay over ceiling panels or lining.

3.5 COMPLETION

Warranties

Insulation and pliable membranes: Submit the KINGSPAN's published product warranties.

Use only where warranties extending beyond the defects liability period are available for the particular system. Insert the required warranty period and terms, which should be negotiated beforehand. If the warranty is in the form of separate material and installation warranties, require the signatures of both manufacturer and installer. If specifying other warranties add as required.

Contact KINGSPAN for a Project Specific Warranty.

Warranty: Provide the following KINGSPAN warranties:

- KINGSPAN AIR-CELL: 15 year minimum period.
- KINGSPAN Kooltherm: 10 year minimum period.
- KINGSPAN Therma: 10 year minimum period.

Form of warranty: [complete/delete]

The form(s) required should be provided as part of the contract documentation.

4 SELECTIONS

Schedules are a way of documenting a selection of proprietary or generic products or systems by their properties. Indicate their locations here and/or on the drawings. Refer to NATSPEC TECHnote GEN 024 for guidance on using and editing schedules.

4.1 FLOORS

Under framed suspended floors

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Permifloor® (for over bearers).
- KINGSPAN AIR-CELL Permifloor® 500 (for between floor joists).

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for open or enclosed floor space.

Thickness: 4 mm.

Application: [complete/delete]

Refer KINGSPAN design guide for application. e.g. between floor joists, over bearers.

Location: [complete/delete]

Describe the location or refer to drawings.

Under suspended concrete slab

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Kooltherm® K10 FM Soffit Board.
- KINGSPAN Kooltherm® K10 White Soffit Board.
- KINGSPAN Kooltherm® K10 PLUS Soffit Board.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for open or enclosed floor space.

Thickness: [complete/delete]

Refer KINGSPAN design guide for information on available board thickness.

Application: [complete/delete]

Refer KINGSPAN technical details for application. e.g. on timber battens, on proprietary grid system, fastener fixed direct to underside of suspended concrete slab.

Location: [complete/delete]

Describe the location or refer to drawings.

Below concrete slab on ground

Product: KINGSPAN Kooltherm® K3 Floorboard.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value.

Location: [complete/delete]

Describe the location or refer to drawings.

Over concrete slab on ground

Applicable where the insulation will be overlaid with another floor finish, e.g. topping screed.

Product: [complete/delete]

Rigid cellular extruded sheets. Check the selected product for adequate moisture resistance.

R-Value: [complete/delete]

Compressive strength: [complete/delete]

Refer to structural consultant and product manufacturer for advice.

Location: [complete/delete]

Describe the location or refer to drawings.

Over framed suspended floors

Product type: KINGSPAN AIR-CELL Permifloor®.

Product: [complete/delete]

Rigid cellular extruded sheets. Select a product with the appropriate compressive strength. KINGSPAN AIR-CELL Permifloor® is not a rigid cellular extruded sheet product, it's a flexible compressible product which can be installed over the floor joists or in between the floor joists (preferably in between).

R-Value: [complete/delete]

Application: Adhesive fix directly to the flooring.

Location: [complete/delete]

Describe the location or refer to drawings.

Reflective sarking membrane

Type: Breather wall wrap.

Duty to AS/NZS 4200.1: [complete/delete]

Select from Extra heavy, Heavy, Medium, Light or Extra light.

Vapour barrier classification to AS/NZS 4200.1: [complete/delete]

Select Low or Unclassified for breather membranes.

Emittance classification to AS/NZS 4200.1: [complete/delete]

Select from Double sided reflective, Reflective or Non-reflective. A reflective foil membrane will require a 20 mm air space to be effective.

Location: [complete/delete]

Describe in relation to other building elements or refer to details. A vapour barrier should be placed on the warm side of bulk insulation.

4.2 WALL INSULATION

Framed wall thermal break strips

Product: [complete/delete]

Bulk thermal insulation to 90 mm framing

Product: [complete/delete]

R-Value: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Bulk thermal insulation to 70 mm framing

Product: [complete/delete]

Select high density batts as required to provide the nominated R-value.

R-Value: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Bulk thermal insulation to 35 mm furring channels

Product: [complete/delete]

Select high density batts as required to provide the nominated R-value.

R-Value: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Reflective insulation to steel or timber framing

Product: [complete/delete]

Select from the following KINGSPAN products and repeat for multiple selections:

- KINGSPAN AIR-CELL Insulbreak® 65/80 (for steel framing).
- KINGSPAN AIR-CELL Permishield® 65 (for timber and steel framing).
- KINGSPAN AIR-CELL Insulbreak® 65/80 and KINGSPAN Kooltherm® K18 insulated plasterboard (for steel framing).
- KINGSPAN AIR-CELL Permishield® 65 and KINGSPAN Kooltherm® K18 insulated plasterboard (for timber and steel framing).

- The selection depends on the vapour permeance requirements of the external wall cladding. The KINGSPAN AIR CELL Permishield® range is vapour permeable.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Full masonry cavity walls

Product: KINGSPAN Kooltherm® K8 cavity board or KINGSPAN AIR-CELL Permicav XV™.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry veneer cavity walls

Product: KINGSPAN AIR-CELL Permicav XV™.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Reverse masonry veneer walls

Product: KINGSPAN AIR-CELL Permishield® 65.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls or concrete walls – internal face – rigid cellular board insulation

Product: KINGSPAN Kooltherm® K17 insulated plasterboard.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls or concrete walls – internal face – reflective insulation

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Permicav XV™.
- KINGSPAN Kooltherm® K12 framing board.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls – external face

Product: KINGSPAN Kooltherm® K5 external wall board.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Thickness: [complete/delete]

Refer KINGSPAN design guide for information on available board thickness.

Location: [complete/delete]

Describe the location or refer to drawings.

Wall wrap (wall sarking)

Type: [complete/delete]

Select from the following:

- Vapour barrier wall wrap.
- Breather wall wrap.

Selection will depend on a number of factors including wall construction, cladding type, location and type of insulation, climate and building use.

Allow for drainage from the wall wrap.

Duty to AS/NZS 4200.1: [complete/delete]

Select from Extra heavy, Heavy, Medium, Light or Extra light.

Vapour barrier classification to AS/NZS 4200.1: [complete/delete]

Select vapour resistance of not more than 0.5 MNs/g when tested to AS/NZS 4200.1 for breather membranes. Select High for vapour barriers.

Emittance classification to AS/NZS 4200.1: [complete/delete]

Select from Double sided reflective, Reflective or Non-reflective. A reflective foil membrane will require a 20 mm air space to be effective.

Location: [complete/delete]

Describe in relation to other building elements or refer to details. A vapour barrier should be placed on the warm side of bulk insulation.

Cold climate vapour barrier

Location: Under the internal lining.

Product: [complete/delete]

Select a foil membrane or rigid board of high vapour barrier classification to AS/NZS 4200.1, and capable of being sealed at joins and fixed without compromising the barrier.

4.3 CEILING INSULATION

Bulk thermal insulation

Product: [complete/delete]

R-Value: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Cathedral ceiling insulation – metal roofing and roofing tiles

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Glareshield XL™ (for timber framed roofs).
- KINGSPAN AIR-CELL Insulbreak® 65 (for metal framed roofs).
- KINGSPAN Kooltherm® K18 insulated plasterboard (for either timber or metal framed roofs).
- KINGSPAN AIR-CELL Glareshield XL™ and KINGSPAN Kooltherm® K18 insulated plasterboard (for timber framed roofs).
- KINGSPAN AIR-CELL Insulbreak® 65 and KINGSPAN Kooltherm® K18 insulated plasterboard (for metal framed roofs).
- KINGSPAN AIR-CELL Insulwhite® (for either timber or metal framed roofs).

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

4.4 ROOF INSULATION

General

Location: The whole of the roof area including skylight shaft walls, except the following:

State if insulation is not required in semi-enclosed spaces (balconies, verandahs) or ancillary buildings (garages, workshops, carports etc.).

- Eaves, overhangs, skylights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches and carports.

Framed roof thermal break strips

Product: [complete/delete]

Reflective foil insulation

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN AIR-CELL Glareshield XL™.
- KINGSPAN AIR-CELL Insulbreak®.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Application: [complete/delete]

e.g. Metal roofs, Tiled roofs.

Location: [complete/delete]

Describe the location or refer to drawings.

Concrete roof slab soffit

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Kooltherm® K10 FM Soffit Board.
- KINGSPAN Kooltherm® K10 White Soffit Board.
- KINGSPAN Kooltherm® K10 PLUS Soffit Board.

R-Value: [complete/delete]

Refer KINGSPAN design guide for information on thermal performance and select R-Value for application.

Thickness: [complete/delete]

Refer KINGSPAN design guide for information on available board thickness.

Application: [complete/delete]

Refer KINGSPAN technical details for application. e.g. on timber battens, on proprietary grid system, fastener fixed direct to underside of suspended concrete slab.

Location: [complete/delete]

Describe the location or refer to drawings.

Combined bulk insulation blanket and reflective foil insulation

Product: [complete/delete]

Thickness: [complete/delete]

Select 55 mm (R1.3), 75 mm (R1.8), 100 mm (R2.3), 125 mm (R2.8), 130 mm (R3.0).

Facing foil Duty: [complete/delete]

Select Light, Medium or Heavy Duty.

Fixing: Lay facing foil face downwards over safety mesh directly underneath metal roof or wall sheeting.

Location: [complete/delete]

Bulk insulation with combined or separate vapour barriers are alternates. Edit as appropriate.

Separate bulk insulation blanket and foil

Separate bulk insulation and foil is required when a white coated foil is selected to ensure a wrinkle free internal surface is preserved for aesthetic reasons.

Bulk insulation: [complete/delete]

Select a blanket.

R-Value: [complete/delete]

Facing foil: [complete/delete]

Duty to AS/NZS 4200.1: [complete/delete]

Select from Extra heavy, Heavy, Medium, Light or Extra light.

- Vapour barrier classification to AS/NZS 4200.1: High.
- Emittance classification to AS/NZS 4200.1: Reflective (single sided).

Location: [complete/delete]

Describe in relation to other building elements or refer to details. A vapour barrier should be placed on the warm side of bulk insulation.

Roof tile sarking

Product: [complete/delete]

Fixing: Between rafters and tile battens.

Location: [complete/delete]

Describe the location or refer to drawings.

Waterproof membrane roofs – IRMA/PMR types

Product: [complete/delete]

Select from the following KINGSPAN products:

- KINGSPAN Thermal™ TR 26 LPC/FM.
- KINGSPAN Thermal™ TR 27 LPC/FM.
- KINGSPAN Thermal™ TR 46 LPC/FM.
- KINGSPAN Thermal™ TR 47 LPC/FM.

R-Value: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS 1366		Rigid cellular plastics sheets for thermal insulation
AS 1366.1	1992	Rigid cellular polyurethane (RC/PUR)
AS 1366.2	1992	Rigid cellular polyisocyanurate (RC/PIR)
AS 1366.3	1992	Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1366.4	1989	Rigid cellular polystyrene - Extruded (RC/PS-E)
AS 1530		Methods for fire tests on building materials, components and structures
AS 1530.2	1993	Test for flammability of materials
AS/NZS 1530.3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS/NZS 1859		Reconstituted wood-based panels - Specifications
AS/NZS 1859.4	2004	Wet-processed fibreboard
AS 2423	2002	Coated steel wire fencing products for terrestrial, aquatic and general use
AS/NZS 3000	2007	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS 3999	2015	Bulk thermal insulation - Installation
AS/NZS 4200		Pliable building membranes and underlays
AS/NZS 4200.1	2017	Materials
AS 4200.2	2017	Installation requirements
AS/NZS 4389	2015	Safety mesh
AS/NZS 4859		Materials for the thermal insulation of buildings
AS/NZS 4859.1	2002	General criteria and technical provisions
AS 5637		Determination of fire hazard properties
AS 5637.1	2015	Wall and ceiling linings
BCA 3.12.1.1	2016	Acceptable construction - Energy efficiency - Building fabric - Building fabric thermal insulation
BCA A2.4	2016	General Provisions - Acceptance of design and construction - Fire hazard properties
BCA Spec C1.10	2016	Fire resistance - Fire hazard properties
BCA J1.2	2016	Energy efficiency - Building fabric - Thermal construction - General
ASTM D6694/D6694M	2015	Standard specification for liquid-applied silicone coating used in spray polyurethane foam roofing

The following documents are mentioned only in the *Guidance* text:

AS 2050	2002	Installation of roof tiles
AS/NZS 4200		Pliable building membranes and underlays
AS/NZS 4200.1	1994	Materials
AS/NZS 4200.2	1994	Installation requirements

AS/NZS 4201		Pliable building membranes and underlays - Methods of test
AS/NZS 4201.4	1994	Resistance to water penetration
ABCB Condensation	2014	Condensation in buildings handbook
BCA 3.12.1	2016	Acceptable construction - Energy efficiency - Building fabric
BCA 3.12.1.4	2016	Acceptable construction - Energy efficiency - Building fabric - External walls
BCA J1.5	2016	Energy efficiency - Building fabric - Walls
NATSPEC DES 003	2006	Fire hazard properties of insulation and pliable membranes
NATSPEC DES 004	2005	Air, moisture and condensation
NATSPEC DES 015	2007	BCA - NCC Volume One Energy efficiency provisions
NATSPEC DES 020	2011	Fire behaviour of building materials and assemblies
NATSPEC DES 031	2014	Specifying R-Values
NATSPEC GEN 006	2007	Product specifying and substitution
NATSPEC GEN 024	2015	Using NATSPEC selections schedules
NATSPEC PRO 002	2006	Mineral wool
NATSPEC TR 01	2017	Specifying ESD
ASTM C168	2017	Standard Terminology Relating to Thermal Insulation
ISO 9229	2007	Thermal insulation - Vocabulary