

0471P KNAUF INSULATION IN THERMAL INSULATION AND PLIABLE MEMBRANES**Branded worksection**

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Worksection abstract

This branded worksection *Template* is applicable to KNAUF INSULATION 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), or acoustic insulation.

Background

See NATSPEC TECHnote DES 004 and the *ABCB Condensation in buildings handbook* for information relating to the use of insulation and vapour control membranes to reduce condensation and moisture flow. BCA F6 contains requirements for the management of condensation in certain classes of buildings. Also see NATSPEC TECHnote DES 015 for information on the NCC 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 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.*
- *0431 Cladding – combined.*
- *0472 Acoustic insulation.*
- *0472p KNAUF INSULATION in acoustic insulation.*
- *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 KNAUF INSULATION

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

- Rigid cellular extruded sheets for over/under suspended framed floors.
- Thermal break strips.
- 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.
- Thermal mass and insulation for temperate climates.
- Strategies and resources for material selection.
- Construction details for cool temperate climates.

Specifying ESD

The following may be specified by retaining default text:

- Framed wall thermal break strips.
- Up to 80% recycled glass fibre in glass wool insulation.

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

KNAUF INSULATION is a global leader in the manufacture of glass wool products (using the Earthwool® brand) and offers a range of thermal and acoustic systems for walls, roofs and floors. KNAUF INSULATION glass wool products are certified as non-combustible and utilize advanced Ecos® Technology, a sustainable binder that contains no added formaldehyde, and is certified by Eurofins Gold as an 'outstanding material' according to VOC (Volatile Organic Compounds) indoor air quality emissions regulations. KNAUF INSULATION offers designers innovative products to satisfy increasingly stringent requirements of energy efficiency and sustainability in homes, non-residential buildings and industrial projects.

1.1 RESPONSIBILITIES

General

Requirement: Provide KNAUF INSULATION 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 NCC.

Performance

Requirements:

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

1.2 COMPANY CONTACTS

KNAUF INSULATION technical contacts

Website: www.knaufinsulation.com.au/contact-us

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

Website: www.knaufinsulation.com.au/architects

See KNAUF INSULATION website for product brochures, CAD drawings, datasheets, BRANZ Appraisals, Codemark Certificates of Conformity, Fire performance tests to AS 1530.1, AS/NZS 1530.3, BIM files, NCC Thermal Calculator and product warranties.

1.5 INTERPRETATION

Abbreviations

General: For the purposes of this worksection, the following abbreviations apply:

- IRMA: Inverted roof membrane assembly.
- PMR: Protected membrane roof.
- XPS: Extruded polystyrene.

Definitions

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

- Bio-soluble: A product that dissolves in bodily fluids and is quickly cleared from the lungs.
- 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: Terminology to BCA A5.5.

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 NCC.

A pliable building membrane may be installed to act as a sarking membrane, vapour barrier, thermal insulation or any combination of the three.

- Thermal insulation terminology: To AS/NZS 4859.1.

See AS/NZS 4859.2 for additional definitions applicable when designing building components for thermal insulation systems.

- 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

Fire performance

Combustibility: Submit evidence of conformity to PRODUCTS, **FIRE PERFORMANCE, Combustibility**.

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

Products and materials

Thermal insulation properties: Submit evidence of conformity to AS/NZS 4859.1 and AS/NZS 4859.2.

This is primarily to verify claimed Total R-Value for NCC compliance.

AS/NZS 4859.1 is applicable to the R-Value of bulk insulation only and excludes insulation built up from layers of different materials and the effects of air spaces and surface resistance. If the system or total R-Value relies on layers of different materials, air spaces or reflective surfaces, the R-Value must be calculated to AS/NZS 4859.2.

AS/NZS 4859.2 includes standard assumptions for calculating R-Values including de-rating of the insulation performance 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. Calculations performed to AS/NZS 4859.2 are not to be used for the purposes of labelling.

See NATSPEC TECHnote DES 031 for information on specifying R-Values.

Evidence of delivery: Submit delivery docket as evidence of delivery of [complete/delete]

If evidence of delivery to site is required for particular products, consider including this *Optional* style text by changing to *Normal* style.

Subcontractors

General: Submit names and contact details of proposed subcontractor for blow-in insulation.

Jet Stream® MAX and JetSpray® Soffit should be installed by an accredited KNAUF INSULATION installer.

Warranties

KNAUF INSULATION published product and project specific warranties: Submit on completion.

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

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the installed pliable membrane and insulation before 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, J1.3 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.

Storage and handling

Marking: Deliver mineral wool products to site in labelled packaging.

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

Combustibility

Insulation: Tested to AS 1530.1.

Check if your construction is required to be non-combustible. Refer to BCA Section C. See KNAUF INSULATION website for BRANZ Appraisals, CodeMark Certificates of Conformity and Fire performance tests to AS 1530.1 and AS/NZS 1530.3.

Non-combustible construction required: [complete/delete]

List any parts of the project that the NCC requires to be non-combustible or delete, if none. The NCC requires that construction required to be non-combustible (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 NCC does not prohibit the use of combustible insulation materials provided they meet the other fire properties.

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 materials: 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: Tested 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: Flammability Index ≤ 5 tested to AS 1530.2.

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 classification: To AS 5637.1.

Non-sprinklered buildings: Wall and ceiling linings must either have an *average specific extinction area* less than 250 m²/kg or a *smoke growth rate index* not more than 100 as determined by AS 5637.1.

KNAUF INSULATION JetSpray® Soffit tested to AS ISO 9705: Group number 1.

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

2.3 INSULATION AND PLIABLE MEMBRANE MATERIALS

General

Mineral wool insulation: Bio-soluble and not listed as a hazardous material in the Safe Work Australia Hazardous Chemical Information System (HCIS).

Bio-soluble or low bio-persistent mineral wool fibres are eliminated by the biological function of the lung. They are not listed as hazardous in the HCIS.

KNAUF INSULATION products are certified by EUCEB (European Certification Board of Mineral Wool) as conforming to the exoneration criteria for carcinogenicity (Note Q) of the Regulation (EC) 1272/2008.

Insulation

Standard: Thermal insulation materials to AS/NZS 4859.1:

AS/NZS 4859.1 categorises insulation as follows: Formed shapes, Formed in situ, Compressible, Loose fill, IR reflective and Vacuum panels.

- Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 4.
- Wool: To AS/NZS 4859.1 Section 5.
- Polyester (compressible): To AS/NZS 4859.1 Section 6.
- Mineral wool blankets and cut pieces (compressible): To AS/NZS 4859.1 Section 7.
- Rigid cellular foam insulation (EPS, PF, PIR, PUR and XPS): To AS/NZS 4859.1 Section 8.

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.

- IR reflective (formed shapes and compressible with one or more external IR reflective surfaces): To AS/NZS 4859.1 Section 9.

Polyurethane (sprayed): To AS 1366.1 Table 2.

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

Pliable building 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 Table 4 categorises vapour control membranes (VCM's) as vapour barriers when classified Class 1 or Class 2, and vapour permeable membranes when classified Class 3 or Class 4.

Sarking membrane (other than walls and gables):

- Water control classification: Water barrier.

If the water control membrane 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 ($\mu\text{g}/\text{N}\cdot\text{s}$) tested to ASTM E96/E96M for vapour control membranes. Vapour permeance is the inverse of vapour resistance ($\text{MN}\cdot\text{s}/\text{g}$), the higher the permeance value, the greater the permeability.

Fasteners and supports

General: Metallic-coated steel.

KNAUF INSULATION fasteners and supports: To KNAUF INSULATION recommendations.

Consider nominating stainless steel in areas of high corrosivity.

Mesh support to roof insulation

Welded safety mesh: To AS/NZS 4389.

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

2.4 KNAUF INSULATION PRODUCTS

Earthwool® External Wall batt

Description: A non-combustible glass wool batt made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde.

Earthwool® External Wall batts improve the performance of the building by reducing the thermal transfer of heat through the building envelope. They also increase the acoustic performance by reducing transfer of sound. Earthwool® External Wall batt has Eurofins Indoor Air Comfort GOLD product certification for low VOC emissions.

Certification: CodeMark certificate CM30094.

See CodeMark certificate for expiry date, conditions and limitations. See www.jas-anz.org/our-directory/codemark-certified-organisations for the CodeMark Register of Certificates of Conformity.

Earthwool® Internal (Acoustic) Wall batt

Description: A non-combustible glass wool insulation batt made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde.

Earthwool® Internal Wall batt insulation is used to improve R_w ratings in timber and metal stud construction. Earthwool® insulation is used for internal wall application. Earthwool® Internal Wall batt has Eurofins Indoor Air Comfort GOLD product certification for low VOC emissions.

Certification: CodeMark certificate CM30094.

See CodeMark certificate for expiry date, conditions and limitations. See www.jas-anz.org/our-directory/codemark-certified-organisations for the CodeMark Register of Certificates of Conformity.

Earthwool® Ceiling batt

Description: A non-combustible glass wool insulation batt made of using to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde.

Earthwool® Ceiling batts improve the thermal performance of the building by reducing the thermal transfer of heat through the building envelope while increasing the acoustic performance of the ceiling. Earthwool® Ceiling batt has Eurofins Indoor Air Comfort GOLD product certification for low VOC emissions.

Certification: CodeMark certificate CM30094.

See CodeMark certificate for expiry date, conditions and limitations. See www.jas-anz.org/our-directory/codemark-certified-organisations for the CodeMark Register of Certificates of Conformity.

ClimaFoam® XPS board

Description: A water resistant, lightweight and rigid insulation board made of extruded polystyrene with a compressive strength of 250 kPa.

ClimaFoam® XPS board can be used for the thermal insulation of flat roofs, concrete slabs and green roofs.

DriTherm® Cavity Slab

Description: A silicone treated glass wool insulation batt made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde.

DriTherm® Cavity Slabs are used in external masonry cavity walls and are installed to fully fill the cavity. DriTherm® Cavity Slab batts are 600 mm wide to suit standard vertical wall tie spacings, for a closed joint with adjacent slabs.

Jet Stream® MAX

Description: An engineered blow-in insulation made of non-combustible, unbonded glass wool, CFC/HCFC free, 0 ODP and GWP glass wool insulation, made using up to 80% recycled glass.

Jet Stream® MAX is designed to be blown into timber framed walls, floors, skillion roofs and ceilings. It creates both a thermal and acoustic barrier. The product completely fills gaps, voids and hard to reach areas around pipes, electrical wires and fixtures. It should only be installed by a KNAUF INSULATION accredited installer.

Certification: CodeMark certificate CM30065 and CM30066.

See CodeMark certificate for expiry date, conditions and limitations. See www.jas-anz.org/our-directory/codemark-certified-organisations for the CodeMark Register of Certificates of Conformity.

Supafil® CarbonPlus

Description: An engineered blow-in, non-combustible glass wool insulation product made using up to 80% recycled glass.

Supafil® CarbonPlus is designed to be blown into timber framed walls, floors, skillion roofs and ceilings. It creates a thermal, acoustic barrier. The product completely fills gaps, voids and hard to reach areas around pipes, electrical wires and fixtures. It should only be installed by a KNAUF INSULATION accredited installer.

Certification: Codemark Certificate CM30057.

See CodeMark certificate for expiry date, conditions and limitations. See www.jas-anz.org/our-directory/codemark-certified-organisations for the CodeMark Register of Certificates of Conformity.

Space Blanket®

Description: A glass wool insulation roll made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde and laminated with heavy duty anti-condensation facing foil.

Space Blanket® is a specialist under-metal roof insulation designed for use in residential and commercial buildings.

JetSpray® Soffit Thermal and Acoustic

Description: A non-combustible spray on insulation system made of unbonded glass wool, with an adhesive binder, directly applied to the underside of soffits.

Classification to AS 5637.1: Group Number 1.

JetSpray® Soffit Thermal and Acoustic is used in conjunction with an adhesive to provide a thermal solution for concrete soffits and crawl spaces and an acoustic solution for mid-floor applications. JetSpray® Soffit Thermal and Acoustic has Eurofins Indoor Air Comfort GOLD product certification for low VOC emissions.

Earthwool® Quilted Underfloor batt

Description: A fully encapsulated glass wool insulation made of up to 80% recycled glass using ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde.

Quilted Underfloor is fully encapsulated to make installation more efficient.

Earthwool® Floorshield Underfloor batt

Description: A glass wool insulation made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde, with a wind wash barrier.

Floorshield is faced with a glass veil facing made of ECOSE® providing a wind wash barrier when installed in underfloor applications.

Earthwool® Roof blanket (Unfaced)

Description: A glass wool insulation made using up to 80% recycled glass, and with ECOSE® Technology, a sustainable, bio-based binder that contains no added formaldehyde, with a wind wash barrier.

Roof blanket can be laminated to facings to achieve desired aesthetic finish, or installed in ceiling/roof applications for both thermal and acoustic solutions.

3 EXECUTION

3.1 GENERAL

Bulk and rigid insulation

Requirement: To AS 3999 and BCA J1.2. or BCA 3.12.1.1, as appropriate.

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

Installation: Firmly butt together glass wool 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 KNAUF INSULATION installation guidelines for the safe use of glass wool and rock wool insulation.

KNAUF INSULATION installation guidelines have been developed in accordance with AS 3999.

Pliable building 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.

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: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Floorshield Underfloor.
- Earthwool® Quilted Underfloor.

Batts: Fit tightly 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.

Under suspended framed floors – rigid insulation

Product type: Rigid cellular extruded sheets.

Installation: [complete/delete]

Select from:

- To the underside of timber strip flooring butted tightly to joists.
- To the underside of timber joists butted tightly to bearers.

If the insulation is exposed, check for fire hazard properties.

Fixing: [complete/delete]

Select Adhesive or Mechanical fasteners.

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: ClimaFoam® XPS Board.

Application: To concrete edge beams.

Installation: To KNAUF INSULATION installation guide.

Refer to KNAUF INSULATION product brochures for information on installation of XPS boards.

Over concrete slab on ground

Product: ClimaFoam® XPS Board.

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 – spray insulation

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

Product: JetSpray® Soffit.

Fixing: Spray on adhesive fixing system.

Under suspended concrete slab – bulk insulation

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

Product type: Fibre batts.

Fixing: Mechanical fasteners and support mesh or nylon twine.

Soffit finish: [complete/delete]

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

3.3 WALLS

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

Framed walls – thermal break strips

Product type: Proprietary item.

Application: To steel framing with lightweight external cladding.

R-Value ($m^2.K/W$): ≥ 0.2 .

See BCA J0.5(c) and BCA 3.12.1.4(d) on wall thermal breaks. R0.2 is a minimum and the NCC requires that Total R-Value and Total System U-Value calculations include allowance for thermal bridging.

Screw fixing: Button head screws at 1 m centres.

Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

Framed walls – bulk insulation

Product type: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Internal Wall batt.
- Earthwool® External Wall batt.
- Supafill® CarbonPlus.

Application: To steel and timber framing.

Fixing: Conform to KNAUF INSULATION installation guide recommendations.

Refer to KNAUF INSULATION product brochures for information on installation of wall insulation to steel or timber framed walls.

Full masonry – cavity walls

Product: DriTherm® Cavity Slab.

Application: To cavity of full masonry wall.

Fixing: On pre-installed wall ties.

Installation: Conform to KNAUF INSULATION installation guide recommendations.

Refer to KNAUF INSULATION product brochures for information on installation of reflective cavity insulation.

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

Masonry veneer cavity walls

Product type: Earthwool® External Wall batt.

Application: To steel or timber framing.

Installation: Conform to KNAUF INSULATION installation guide recommendations. Do not bridge the cavity.

Refer to KNAUF INSULATION product brochures for information on installation of insulation to outside face of stud wall framing in masonry veneer walls.

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

Reverse masonry veneer cavity walls

Product: Earthwool® External Wall batt.

Application: To battens on outer face of masonry skin.

Installation: Conform to KNAUF INSULATION installation recommendations.

Refer to KNAUF INSULATION product brochures for information on installation of insulation to outside face of masonry skin and under applied cladding using counter battens.

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 a 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 *ABC B Condensation in buildings handbook* for information on condensation and use of vapour barriers, vapour permeable membranes and sarking. Also see BCA F6.2 requirements for managing condensation in external walls of a sole-occupancy unit in a class 2 building and a class 4 part of a building.

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 or planks 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

General

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.

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. Coordinate with 0421 Roofing – combined. Do not call up welded safety mesh in more than one clause in the specification.

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.

Installing welded safety mesh: To AS/NZS 4389.

Pliable building membranes

See AS 4200.2 Section 3 for pliable building membranes for roofing.

Sarking membrane:

- Location: Provide sarking under tile and shingle roofing.

AS 2050 specifies sarking requirements for tiled roofs. AS 2050 is cited in the NCC 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 – thermal break strips

Product type: Proprietary item.

Application: To steel framing supporting metal sheet roof cladding.

R-Value ($\text{m}^2\cdot\text{K}/\text{W}$): ≥ 0.2 .

See BCA J0.4 and BCA 3.12.1.2 on roof thermal breaks. R0.2 is a minimum and the NCC requires that Total R-Value and Total System U-Value calculations include allowance for thermal bridging.

Metal roofs – bulk insulation

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Roof blanket.
- Space Blanket®.
- Supafil® CarbonPlus.

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

Product: Space Blanket®.

Application: Under metal roof sheeting.

Installation: Conform to KNAUF INSULATION installation guide recommendations.

Refer to KNAUF INSULATION product brochures for information on installation of reflective insulation to metal roofs for both residential and commercial applications.

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 documented in *0411 Waterproofing – external and tanking*.

Product type: Rigid cellular extruded sheets.

Preparation: Make sure membrane is clean and free of loose material.

Separation layer: Lay over membrane with edges lapped 300 mm and turned up at upstands and penetrations.

Document separation layer in *0411 Waterproofing – external and tanking*, or delete if not required.

Installation: Lay insulation boards in brick pattern with shiplap edges pushed together firmly, cut neatly around penetrations and extend up upstands.

Finish: [complete/delete]

Document a filter/protection layer over the waterproof membrane 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 list in **CROSS REFERENCES, General**.

Cathedral ceiling insulation – metal roofing and roofing tiles

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Ceiling insulation.
- Earthwool® Roof blanket.
- Space Blanket®.
- Jet Stream® MAX.

Application: Under roof sheeting.

Installation: Conform to KNAUF INSULATION installation guide recommendations.

Refer to KNAUF INSULATION product brochures for information on installation of reflective insulation to metal and tiled roofs for residential applications.

Ceiling insulation

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Jet Stream® MAX.
- Earthwool® Ceiling batt.
- Supafil® CarbonPlus.

Application: In ceiling space over ceiling lining.

Installation: Conform to KNAUF INSULATION installation guide recommendations.

Refer to KNAUF INSULATION product brochures for information on installation in ceilings.

3.5 COMPLETION**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.

Product warranty: [complete/delete]

Select from the following KNAUF INSULATION product warranties:

- DriTherm® Cavity slab – 25 year warranty for moisture resistance.

- Earthwool® Underfloor – 25 year warranty.
- Earthwool® – 50 year warranty.
- Space Blanket® – 25 year warranty.
- Supafil® CarbonPlus – 50 year warranty.
- Jet Stream® MAX – 50 year warranty.
- DriTherm® Cavity Slab – 50 year warranty.
- JetSpray® Soffit Thermal and Acoustic – 50 year warranty.

Project specific warranty: Warranty provided by KNAUF INSULATION following satisfactory site inspection.

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 FLOOR INSULATION

Under suspended framed floors

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Underfloor.
- Earthwool® Floorshield Underfloor.
- Earthwool® Quilted Underfloor.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Application: [complete/delete]

Describe the 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 KNAUF INSULATION products:

- JetSpray® Soffit.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Application: [complete/delete]

Refer to KNAUF INSULATION technical details for application. e.g. to slab soffits.

Location: [complete/delete]

Describe the location or refer to drawings.

Below concrete slab on ground

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- ClimaFoam® XPS board.

R-Value (m².K/W):[complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value. e.g. R 1.1 , R 1.4, R 1.8, R 2.7.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available board thickness. e.g. 30 mm, 40 mm, 55 mm, and 75mm.

Length:[complete/delete]

Refer to KNAUF INSULATION product brochures for information on available board lengths: e.g. 1200 mm , 2200 mm.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available board widths: e.g. 600 mm; 1200 mm.

Application: [complete/delete]

Refer to KNAUF INSULATION technical details for application. e.g. to all slab edges where insulation is laid under concrete slabs on ground.

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 (m².K/W): [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 suspended framed floors

Application: Adhesive fix directly to the flooring.

Product: [complete/delete]

Rigid cellular extruded sheets.

R-Value (m².K/W): [complete/delete]

Refer to the acoustic consultant or product manufacturer for advice.

Location: [complete/delete]

Describe the location or refer to drawings.

Reflective vapour control membrane

Type: Breather wall wrap.

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

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

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

Select Class 3 or Class 4 for vapour permeable 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 control membrane can be placed anywhere in the wall profile, refer to the manufacturer's instructions.

4.2 WALLS

Framed walls – thermal break strips

Application: To steel framing with lightweight external cladding.

Product: [complete/delete]

Bulk thermal insulation to lightweight framing

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Internal Wall batt.
- Earthwool® External Wall batt.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Length: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available lengths.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available widths.

Location: [complete/delete]

Describe the location or refer to drawings.

Reflective insulation to steel or timber framing

Product: [complete/delete]

Select reflective bulk insulation rolls as required to provide to nominated R-Value.

R-Value (m².K/W): [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Full masonry cavity walls

Product: DriTherm® Cavity Slab.

R-Value (m².K/W): 1.4.

Thickness: 50 mm.

Length: 1100 mm.

Width: 600 mm.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry veneer cavity walls

Product: Earthwool® External Wall batt.

R-Value (m².K/W): [complete/delete]

Refer KNAUF INSULATION product brochures for information on thermal performance and select R-Value for application.

Location: [complete/delete]

Describe the location or refer to drawings.

Reverse masonry veneer cavity walls

Product: Earthwool® External Wall batt.

R-Value (m².K/W): [complete/delete]

Refer KNAUF INSULATION product brochures for information on thermal performance and select R-Value for application.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Length:[complete/delete]

Refer to KNAUF INSULATION product brochures for information on available lengths.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available widths.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls or concrete walls – internal face

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Earthwool® Internal Wall batt.
- Earthwool® External Wall batt.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Length:[complete/delete]

Refer to KNAUF INSULATION product brochures for information on available lengths.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available widths.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls or concrete walls – internal face – reflective insulation

Product: [complete/delete]

Select bulk insulation as required to provide the nominated R-Value.

R-Value (m².K/W): [complete/delete]

Thickness: [complete/delete]

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry walls – external face

Product: [complete/delete]

Select bulk insulation as required to provide the nominated R-Value.

R-Value (m².K/W): [complete/delete]

Thickness: [complete/delete]

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 Class 1 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.

Cold climate vapour barrier

Location: Under the internal lining.

Product: [complete/delete]

Select a foil membrane or rigid board of Class 1 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: Earthwool® Ceiling batt

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available thickness.

Length: 1160 mm.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on available widths. e.g. 430 mm, 580 mm

Location: [complete/delete]

Describe the location or refer to drawings.

Blown-in insulation

Product: [complete/delete]

Select from the following KNAUF INSULATION products:

- Jet Stream® MAX.
- Supafil® CarbonPlus.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness required to achieve required thermal and acoustic performance.

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 KNAUF INSULATION products:

- Earthwool® insulation.
- Jet Stream® MAX.
- Space Blanket®.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value for application.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness required to achieve required thermal and acoustic performance.

Location: [complete/delete]

Describe the location or refer to drawings.

4.4 ROOFS

Framed roof thermal break strips

Product: [complete/delete]

Reflective foil insulation

Product: Space Blanket®.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value. Select from R 1.3, R 1.8.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness. Select from: 55 mm, 75 mm.

Length: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on length. Select from: 10 000 mm, 15 000 mm, or to suit roof pitch and length.

Width: 1200 mm.

Application: [complete/delete]

e.g. Metal roofs, Tiled roofs.

Location: [complete/delete]

Describe the location or refer to drawings.

Concrete roof slab soffit

Product: JetSpray® Soffit.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness.

Application: [complete/delete]

Insulation applied directly to the underside of suspended concrete slabs. Directly fixed or adhered: 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: Space Blanket®.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value. Select from R 1.3, R 1.8.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness. Select from: 55 mm, 75 mm.

Length: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on length. Select from: 10 000 mm, 15 000 mm, or to suit roof pitch and length.

Width: 1200 mm.

Location: [complete/delete]

Describe the location or refer to drawings.

Application: [complete/delete]

e.g. Metal roofs.

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.

Insulation product: Earthwool® Roof blanket.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value.

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: Class 1.

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: ClimaFoam® XPS Board.

R-Value (m².K/W): [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thermal performance and select R-Value for application.

Thickness: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on thickness. Select from: 30 mm, 40 mm, 50 mm, 75 mm.

Length: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on length. Select from: 1200 mm, 2200 mm.

Width: [complete/delete]

Refer to KNAUF INSULATION product brochures for information on width. Select from: 600 mm, 1200 mm.

Joint type: [complete/delete]

Select from: straight or shiplap.

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 1530		Methods for fire tests on building materials, components and structures
AS 1530.1	1994	Combustibility test for materials
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	2018	Wet process fibreboard
AS/NZS 3000	2018	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	Roof safety mesh
AS/NZS 4859		Thermal insulation of buildings
AS/NZS 4859.1	2018	General criteria and technical provisions
AS/NZS 4859.2	2018	Design
AS 5637		Determination of fire hazard properties
AS 5637.1	2015	Wall and ceiling linings
BCA 3.12.1.1	2019	Acceptable construction - Energy efficiency - Building fabric - Building fabric thermal insulation
BCA A5.5	2019	Governing requirements - Documentation of design and construction - Fire hazard properties

BCA J1.2	2019	Energy efficiency - Building fabric - Thermal construction - General
Safe Work Australia		Hazardous chemical information system
The following documents are mentioned only in the <i>Guidance</i> text:		
AS 2050	2018	Installation of roof tiles
AS/NZS 4201		Pliable building membranes and underlays - Methods of test
AS/NZS 4201.4	1994	Resistance to water penetration
AS ISO 9705	2003	Fire tests - Full-scale room test for surface products
ABCB Condensation	2014	Condensation in buildings handbook
BCA 3.12.1	2019	Acceptable construction - Energy efficiency - Building fabric
BCA 3.12.1.4	2019	Acceptable construction - Energy efficiency - Building fabric - External walls
BCA 3.12.1.2	2019	Acceptable construction - Energy efficiency - Building fabric - Roofs
BCA Section C	2019	Fire Resistance
BCA Spec C1.10	2019	Fire resistance - Fire hazard properties
BCA F6	2019	Health and amenity - Condensation management
BCA F6.2	2019	Health and amenity - Condensation management - Pliable building membrane
BCA J0.4	2019	Energy efficiency - Energy efficiency - Roof thermal breaks
BCA J0.5	2019	Energy efficiency - Energy efficiency - Wall thermal breaks
NATSPEC DES 003	2018	Fire hazard properties of insulation and pliable membranes
NATSPEC DES 004	2019	Air, moisture and condensation
NATSPEC DES 015	2019	NCC - BCA Volume One Energy efficiency provisions
NATSPEC DES 020	2018	Fire behaviour of building materials and assemblies
NATSPEC DES 031	2019	Specifying R-Values
NATSPEC GEN 006	2015	Product specifying and substitution
NATSPEC GEN 024	2015	Using NATSPEC selections schedules
NATSPEC TR 01	2019	Specifying ESD
NCC	2019	National Construction Code
ASTM E96/E96M	2016	Standard Test Methods for Water Vapor Transmission of Materials