

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

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Worksection abstract

This branded worksection *Template* is applicable to INTEGRA BUILDING PRODUCTS insulation and pliable membranes for floors, walls, ceilings and roofs. It generally relies on AS 3999AS/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 F6.2 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.

How to use this worksection

This worksection *Template* must be customised for each project. See [A guide to NATSPEC worksections \(www.natspec.com.au\)](#) for information on *Template* structure, word styles, and completing a worksection.

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.*
- *0522 Partitions – framed and lined.*
- *0531 Suspended ceilings – combined.*
- *0744 Ductwork insulation* for thermal insulation and sheathing of ductwork.

Material not provided by INTEGRA BUILDING PRODUCTS

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

- Insulation forming part of a proprietary roofing, cladding or lining system.
- Thermal break strips.
- Mesh support.

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.

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

INTEGRA BUILDING PRODUCTS is a supplier of Australian-made and imported insulation and pliable membranes, including: formaldehyde and CFC/HCFC free rigid non-porous thermoset insulation; extruded and polystyrene; vapour permeable membrane for use in climate zones 4-8; reflective foil laminates and foil faced blankets; and glass/mineral wool bulk insulation used for walls and ceilings. All products follow European details, providing high performance at an affordable price.

INTEGRA BUILDING PRODUCTS insulation experts can provide thermal and airtight solutions for BCA JV3 modelling, BCA Section J, Green Star and NatHERS Star ratings.

1.1 RESPONSIBILITIES

General

Requirement: Provide INTEGRA BUILDING PRODUCTS 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

INTEGRA technical contacts

Website: www.integrabuildingproducts/start-project/

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

Datasheets: www.integrabuildingproducts/datasheets/

Specifications and guidance: www.integrabuildingproducts/specification/

1.5 INTERPRETATION

Abbreviations

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

- IRMA: Inverted roof membrane assembly.
- PIR: Polyisocyanurate insulation foam.

- 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.
- 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

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.

Warranties

Integra Building Products published product warranties: Submit warranties to **COMPLETION**, **Warranties**.

Describe the requirements of warranties in PRODUCTS or **EXECUTION**, as appropriate.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- 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

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. If non-combustible construction is required, change this *Optional* style text to *Normal* style text and add to **SUBMISSIONS, Fire performance**.

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.

If non-combustible construction is required, change this *Optional* style text to *Normal* style text.

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: 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 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.

2.3 INSULATION AND PLIABLE MEMBRANE MATERIALS

Insulation

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.

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-persistence mineral wool fibres are eliminated by the biological function of the lung. They are not listed as hazardous in the HCIS. See the NATSPEC TECHnote PRO 002 for more information on the manufacture, properties and safety issues related to the use of mineral wool. For information on the ICANZ (Insulation Council of Australia and New Zealand) FBS-1 BIO-SOLUBLE INSULATION label for Australian manufactured mineral wool, see icanz.org.au. For imported products, check availability of evidence such as EUCEB certification.

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.

INTEGRA BUILDING PRODUCTS fasteners and supports: Conform to INTEGRA BUILDING PRODUCTS 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 INTEGRA BUILDING PRODUCTS INSULATION

Brownie by Ecowool batt

Description: A glass mineral wool insulation batt with formaldehyde free binder.

Bulk insulation suitable for use under suspended framed floors, framed walls, masonry veneer cavity walls, under metal and tile roofing, and ceilings.

DeSilvaLine by Pirmax

Description: A rigid non-porous thermoset PIR insulation core with reflective foil facing to upper and lower sides.

Rigid insulation suitable for use under suspended framed floors, over suspended framed floors, below concrete slab on ground, over concrete slabs on ground, under suspended concrete slabs, steel or timber framed walls, masonry veneer cavity walls, full masonry walls (inner and outer cavity skins, and internal face), and concrete roof slab soffits.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

Fastwrap Wall underlay

Description: A flexible, spun-bonded polypropylene, vapour permeable wall sarking.

Pliable membrane suitable for use as vapour permeable membrane behind external facing material.

Fastwrap FlameSpec HW roof underlay

Description: A heavyweight, flexible, fire-retardant, synthetic, vapour permeable roof sarking.

Pliable membrane suitable for use as sarking under tile and metal roofing.

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 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* and the manufacturer's installation guidelines.

The *ICANZ 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.

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 FLOOR INSULATION

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: Brownie by Ecowool batts.

Installation: 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: DeSilvaLine by Pirmax.

Fixing: To INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCTS design guide for information on installation of reflective insulation.

Over suspended framed floors

Product: DeSilvaLine by Pirmax.

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: DeSilvaLine by Pirmax.

Fixing: To INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCTS design guide for information on installation of reflective insulation.

Preparation: Select sand blinding.

Laying pattern: Stretcher bond, with edges tightly butted.

Damp-proof membrane: Lay under insulation.

Over concrete slab on ground

Product: DeSilvaLine by Pirmax.

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 separates a conditioned space from an unconditioned space, such as roof tops, balconies, car parks and plantroom areas.

Product: DeSilvaLine by Pirmax.

Fixing: [complete/delete]

Refer to INTEGRA BUILDING PRODUCTS 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 72 mm reinforced foil tape to all joints.

Soffit finish: [complete/delete]

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

Areas requiring Group 1 should not use DeSilvaLine by Pirmax without fire engineers approval using a thermal laminate or concealed insulated wall or ceiling lining.

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 (m².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: Brownie by Ecowool wall batt.

Application: To steel and timber framing.

Installation: 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.

Rigid board insulation to steel or timber framed walls

Product: DeSilvaLine by Pirmax.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

Application: To steel and timber framing.

Fixing: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations.

Masonry veneer cavity walls

Product: Brownie by Ecowool wall batt.

Application: To steel or timber framing.

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations. Do not bridge the cavity.

Refer to INTEGRA BUILDING PRODUCT design guide 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.

Full masonry – cavity outer skin walls

Product: DeSilvaLine by Pirmax.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

Application: To the outer masonry skin.

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations. Do not bridge the cavity.

Refer to INTEGRA BUILDING PRODUCTS 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: DeSilvaLine by Pirmax.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

Application: To the inner masonry skin.

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations. Do not bridge the cavity.

Refer to INTEGRA BUILDING PRODUCTS 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.

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

Product: DeSilvaLine by Pirmax.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

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

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCTS design guide for information on installation of insulation with direct fix clip and top hats, and insulated plasterboard lining to the inner face of masonry or concrete walls using adhesive method for alteration or addition to existing walls or where space is cannot accommodate a 5 mm furring channel.

Masonry walls or concrete walls – internal face – reflective insulation

Product: DeSilvaLine by Pirmax.

Check BCA Spec C1.10 if wall construction is required to be non-combustible. This product is only permitted for wall assemblies not required to be non-combustible.

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

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations.

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

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

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.

Product: Fastwrap Wall underlay.

Application: Behind the external facing material.

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 airtight 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, along with perimeter guard rails. AS/NZS 4389, on welded safety mesh, is called up in 0421 Roofing – combined. Coordinate.

Locations: Provide support to the following:

- Sarking, vapour barrier or reflective thermal insulation membranes laid over roof framing members that 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.

Product: Fastwrap FlameSpec HW roof underlay.

Application: Under tile and metal roofing.

Installation: To the manufacturer's recommendations.

Metal roofs – thermal break strips

Product type: Proprietary item.

Application: To steel framing supporting metal sheet roof cladding.

R-Value (m².K/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: Brownie by Ecowool batts.

Installation: Conform to INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCT design guide on installation of metal roof insulation.

Concrete roof slab soffit

Product: DeSilvaLine by Pirmax.

Installation: To INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCT design guide 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 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

Fibre batts bulk insulation installed between ceiling joists.

Product: Brownie by Ecowool.

Application: Over ceiling lining that has been fixed to rafters.

Installation: To INTEGRA BUILDING PRODUCTS installation guide recommendations.

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

Ceiling insulation – bulk insulation

Product type: Brownie by Ecowool batts.

Application: In ceiling space over ceiling lining.

Installation: To INTEGRA BUILDING PRODUCTS installation guide recommendations.

Refer to INTEGRA BUILDING PRODUCTS design guide for information on installation of insulation in ceilings.

3.5 COMPLETION

Warranties

Product warranty: [complete/delete]

Select from the following INTEGRA BUILDING PRODUCT warranties:

- DeSilvaLine by Pirmax: 10 years.
- Fastwrap Wall underlay: 10 years.
- Fastwrap Flamespec HW roof underlay: 10 years.
- Brownie by Ecowool: 10 years.

Extended warranty periods are available for DeSilvaLine products.

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

INTEGRA BUILDING PRODUCTS floor insulation schedule

Property	A	B	C
Application			
Product			
Location			
R-Value (m ² .K/W)			
Thickness (mm)			
Size (mm)			
R _w rating			
Compressive strength (kPa)			

A, B, C: These designate each instance or type of the item scheduled.

Edit codes in the Schedule to match those on drawings.

Application: Select from the following:

- Under suspended framed floor.
- Over suspended framed floor.
- Below concrete slab on ground.
- Over concrete slab on ground.
- Under suspended concrete slab.

Product: Select from the following:

- Under suspended framed floor: DeSilvaLine by Pirmax, Brownie by Ecowool.
- Over suspended framed floor: DeSilvaLine by Pirmax.
- Below concrete slab on ground: Select from DeSilvaLine by Pirmax.

- Over concrete slab on ground: Select from DeSilvaLine by Pirmax.
- Under suspended concrete slab: DeSilvaLine by Pirmax.
- Location: Describe location or show on the drawings, e.g. Under the entire slab or 1200 mm to the perimeter at two board widths wide.

R-Value (m².K/W): Select from:

- DeSilvaLine by Pirmax: R 0.85 (20 mm), R 1.05 (25 mm), R 1.30 (30 mm), R 1.90 (40 mm), R 2.10 (45 mm), R 2.35 (50 mm), R 2.85 (60 mm), R 3.10 (65 mm), R 3.30 (70 mm), R 3.55 (75 mm), R 4.0 (80 mm), R 4.50 (90 mm).
- Brownie by Ecowool: R 1.0 (50 mm), R 1.5 (75 mm), R 2.0 (90 mm).

AS/NZS 4859.1 requires that R-Value is declared at 23°C for insulation products sold in Australia.

Thickness (mm): Select from:

- DeSilvaLine by Pirmax: 20 mm, 25 mm, 30 mm, 40 mm 45 mm, 50 mm, 60 mm, 65 mm, 70 mm, 75 mm, 80 mm, 90 mm.
- Brownie by Ecowool: 50 mm, 75 mm, 90 mm.

Size (mm): Select from:

- DeSilvaLine by Pirmax: 1200 mm x 2400 mm.
- Brownie by Ecowool: 600 mm x 1200 mm.

Rw rating: If the insulation is required to contain or exclude noise refer to the acoustic consultant or product manufacturer for advice.

Compressive strength (kPa):

- DeSilvaLine by Pirmax: 125 kPa.

4.2 WALL INSULATION

INTEGRA BUILDING PRODUCTS wall insulation schedule

Property	A	B	C
Application			
Product			
Location			
R-Value (m ² .K/W)			
Thickness (mm)			
Size (mm)			
R _w rating			

A, B, C: These designate each instance or type of the item scheduled.

Edit codes in the **Schedule** to match those on drawings.

Application: Select from the following:

- Framed walls with cladding.
- Masonry veneer cavity walls.
- Full masonry cavity walls – external face of internal leaf.
- Full masonry cavity walls – internal face of internal leaf.

Product:

- Framed walls with cladding: Select from DeSilvaLine by Pirmax, Brownie by Ecowool wall batts.
- Masonry veneer cavity walls: Brownie by Ecowool wall batts.
- Full masonry cavity walls – external face of internal leaf: DeSilvaLine by Pirmax
- Full masonry cavity walls – internal face of internal leaf: DeSilvaLine by Pirmax

Location: Describe location or show on the drawings.

R-Value (m².K/W): Select from:

- DeSilvaLine by Pirmax: : R 0.85 (20 mm), R 1.05 (25 mm), R 1.30 (30 mm), R 1.90 (40 mm), R 2.10 (45 mm), R 2.35 (50 mm), R 2.85 (60 mm), R 3.10 (65 mm), R 3.30 (70 mm), R 3.55 (75 mm), R 4.0 (80 mm), R 4.50 (90 mm).
- Brownie by Ecowool: R 0.7 (25 mm), R 1.2 (50 mm), R 1.8 (75 mm), R 2.5 (90 mm).

AS/NZS 4859.1 requires that R-Value is declared at 23°C for insulation products sold in Australia.

Thickness (mm): Select from:

- DeSilvaLine by Pirmax: 20 mm, 25 mm, 30 mm, 40 mm 45 mm, 50 mm, 60 mm, 65 mm, 70 mm, 75 mm, 80 mm, 90 mm.
- Brownie by Ecowool: 25 mm, 50 mm, 75 mm, 90 mm.

Size (mm): Select from:

- DeSilvaLine by Pirmax: 1200 mm x 2400 mm.
- Brownie by Ecowool batts: 450 mm x 1160 mm, 600 mm x 1160 mm.

R_w rating: If the insulation is required to contain or exclude noise refer to the acoustic consultant or product manufacturer for advice.

4.3 CEILING INSULATION

INTEGRA BUILDING PRODUCTS ceiling insulation schedule

Property	A	B	C
Application			
Product			
Location			
R-Value (m ² .K/W)			
Thickness (mm)			
Size (mm)			
R _w rating			

A, B, C: These designate each instance or type of the item scheduled.

Edit codes in the **Schedule** to match those on drawings.

Application: Select from the following:

- Cathedral ceiling insulation.
- Ceiling insulation.
- Under suspended concrete slab.

Product: Select from:

- Cathedral ceiling insulation: Brownie by Ecowool.
- Ceiling insulation: Brownie by Ecowool batts.
- Under suspended concrete slab: DeSilvaLine by Pirmax.

Location: Describe location or show on the drawings.

R-Value (m².K/W): Select from:

- DeSilvaLine by Pirmax: R 0.85 (20 mm), R 1.05 (25 mm), R 1.30 (30 mm), R 1.90 (40 mm), R 2.10 (45 mm), R 2.35 (50 mm), R 2.85 (60 mm), R 3.10 (65 mm), R 3.30 (70 mm), R 3.55 (75 mm), R 4.0 (80 mm), R 4.50 (90 mm).
- Brownie by Ecowool: R 2.5 (120 mm), R 3.0 (140 mm), R 3.5 (165 mm), R 4.1 (195 mm), R 5.0 (236 mm), R 6.0 (278 mm).

AS/NZS 4859.1 requires that R-Value is declared at 23°C for insulation products sold in Australia.

Thickness (mm): Select from:

- DeSilvaLine by Pirmax: 20 mm, 25 mm, 30 mm, 40 mm 45 mm, 50 mm, 60 mm, 65 mm, 70 mm, 75 mm, 80 mm, 90 mm .
- Brownie by Ecowool: 120 mm, 140 mm, 165 mm, 195 mm, 236 mm, 278 mm.

Size (mm): Select from:

- DeSilvaLine by Pirmax: 1200 mm x 2400 mm.
- Brownie by Ecowool: 430 mm x 1160 mm, 580 mm x 1160 mm.

R_w rating: If the insulation is required to contain or exclude noise refer to the acoustic consultant or product manufacturer for advice.

4.4 ROOF INSULATION

INTEGRA BUILDING PRODUCTS roof insulation schedule

Property	A	B	C
Application			

Property	A	B	C
Product			
Location			
R-Value (m ² .K/W)			
Thickness (mm)			
Size (mm)			
R _w rating			

A, B, C: These designate each instance or type of the item scheduled.

Edit codes in the **Schedule** to match those on drawings.

Application: Select from the following:

- Tiled roofs – bulk insulation.
- Metal roofs – bulk insulation.

Product: Select from:

- Tiled roofs – bulk insulation: Brownie by Ecowool batts.
- Metal roofs – bulk insulation: Brownie by Ecowool batts.

Location: Describe location or show on the drawings.

R-Value (m².K/W): Select from:

- Brownie by Ecowool: R 1.35 (50 mm), R 1.45 (50 mm), R 1.5 (50 mm), R 1.6 (50 mm), R 2.0 (75 mm), R 2.7(100 mm).

AS/NZS 4859.1 requires that R-Value is declared at 23°C for insulation products sold in Australia.

Thickness (mm): Select from:

- Brownie by Ecowool: 50 mm, 75 mm, 100 mm.

Size (mm): Select from:

- Brownie by Ecowool: 600 mm x 1200 mm.

R_w rating: If the insulation is required to contain or exclude noise refer to the acoustic consultant or product manufacturer for advice.

4.5 PLIABLE MEMBRANES

INTEGRA BUILDING PRODUCTS pliable building membranes schedule

Property	A	B	C
Application			
Product			
Location			

A, B, C: These designate each instance or type of the item scheduled. Edit codes in the **Schedule** to match those on drawings.

- Application: Select from the following:
- Vapour permeable (breathable) membrane (vapour control membrane (VCM)).

Sarking membrane (water control membrane).

Product: Select from:

- Vapour permeable (breathable) membrane: Fastwrap wall underlay.
- Sarking membrane: Fastwrap FlameSpec HW roof underlay.

Location: Describe location or show on the drawings.

AS/NZS 4859.1 requires that R-Value is declared at 23°C for insulation products sold in Australia.

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 1530.2	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
AS/NZS 4389	2015	Roof safety mesh
AS/NZS 4859		Thermal insulation materials for 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
ICANZ	2003	Industry code of practice for the safe use of glass wool and rock wool insulation
Safe Work Australia		Hazardous chemical information system
The following documents are mentioned only in the Guidance text:		
AS 1530		Methods for fire tests on building materials, components and structures
AS 1530.1	1994	Combustibility test for materials
AS/NZS 4201		Pliable building membranes and underlays - Methods of test
AS/NZS 4201.4	1994	Resistance to water penetration
ABCB Condensation	2019	Condensation in buildings handbook
BCA 3.12.1.2	2019	Acceptable construction - Energy efficiency - Building fabric - Roofs
BCA 3.12.1.4	2019	Acceptable construction - Energy efficiency - Building fabric - External walls
BCA Section C	2019	Fire resistance
BCA Spec C.1.10	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 Section J	2019	Energy efficiency
BCA J0.4	2019	Energy efficiency - Energy efficiency - Roof thermal breaks
BCA J0.5	2019	Energy efficiency - Energy efficiency - Wall thermal breaks
ICANZ FBS-1	2009	Glass wool bio-soluble insulation
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	2019	Using NATSPEC selections schedules
NATSPEC PRO 002	2019	Mineral wool
NATSPEC TR 01	2019	Specifying ESD
ASTM E96/E96M	2016	Standard Test Methods for Water Vapor Transmission of Materials