Fletcher Insulation

Building Better, Together

NEW CONDENSATION MANAGEMENT SOLUTIONS FOR RESIDENTIAL PITCHED ROOF APPLICATIONS

NEW PRODUCT
Drainage batten

Residential roofing insulation for standard pitched metal roofs

Product Solutions Guide: Designing for NCC 2019

We are in the business of building better

As a leading manufacturer of products for the Australian building industry, Fletcher Insulation has been at the forefront of insulation technology since the 1930s. With a national distribution footprint, we pride ourselves on providing excellent service to our customers. Our manufacturing plants in Australia are supported with research and development, customer service, sales and technical support.

Sustainability is at the heart of what we do. Our strong focus on well-being, comfort and improving quality of life inspires us to design, manufacture and deliver world class insulation solutions for the built environment.

Residential metal roof.

Insulation selections for metal roof applications in residential building projects

Designing for the comfort and wellbeing of homeowners or occupants in residences with metal roofing requires a combination of thermal, acoustic and condensation management when selecting insulation.

The following addresses the key considerations relating to residential metal roofing solutions and have been designed specifically for residential frame and truss structures:

Condensation management considerations

Whilst thermal performance requirements for homes continue to increase and remain important, condensation has progressively developed as a critical design consideration for healthy homes. Poor management of moisture and vapours in building design may possibly result in internal long term health concerns and building defects that could entail unnecessary and costly corrective repairs.

Design decisions for roof insulation and ceiling insulation are much more complex in relation to condensation control as products need to be selected to manage water vapour in roofs. This will vary by climate zone and hence selecting the right products for the right climate zones is important for compliance, as well as the health and well-being of occupants.

Thermal considerations

The National Construction Code of Australia (NCC) requires minimum levels of energy efficiency for buildings, which can be achieved through different design approaches.

Roof insulation and ceiling insulation can be selected dependent on the performance levels required for the building. Roof and ceiling insulation work together to deliver the thermal performance of a roof. Where roof insulation with lower R-values is used, overall higher thermal performance can be achieved by increasing ceiling insulation.

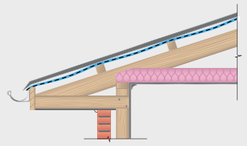
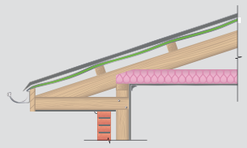
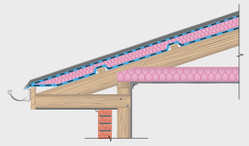
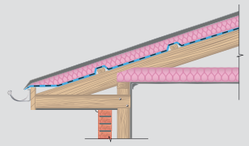
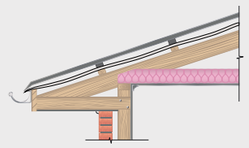
Acoustic considerations

The overall acoustic performance of the ceiling is impacted by the roof and ceiling insulation – and similar to thermal performance considerations, can be selected based on the performance of the system required.

Although acoustic performance is not a requirement of the NCC for residential applications, it is a design consideration that can directly impact the wellbeing of the occupants.

Quick reference guide for selecting the correct product solution

Product recommendations for each solution are provided as a general guide on the suitability of installing various forms of insulation under metal residential roofs for standard pitched dwellings. They are based on average building use and typical construction methods in accordance with the NCC. For project specific advice please contact Fletcher Insulation's Technical team.

Product solution	Climate zone suitability	System diagram	Solution explained	Vapour barrier	Vapour permeable	Provides additional R-value	Thermal break	BAL compliant
Sisalation® Metal roof (MD 433 or HD 453)	1 2 3 4 5 6		This solution is designed for more temperate and humid climates where water vapour control from outside the building envelope is required. This solution works effectively with higher ceiling R-value to achieve thermal and acoustic performance.	✓		✓		✓
Sisalation® Foam Cell Multipurpose	1 2 3 4 5 6		An effective solution for hot humid and warmer climates where water vapour is to be kept out of the building envelope. This product provides a minimal R-value combined with higher reflective performance. This solution works with a nominal increase in ceiling insulation and helps manage temperature in the roof cavity.	✓		✓	✓	✓
Permastop® Tropic Building Blanket	1		Permastop® combines two effective types of insulation (glasswool and foil facing) into one single product to manage temperature, condensation and reduce unwanted noise. This solution works in conjunction with ceiling insulation to provide thermal and acoustic performance.	✓		✓		✓
Permastop® Building Blanket	2 3 4 5 6 7 8		Permastop® combines two effective types of insulation (glasswool and foil facing) into one single product to manage temperature, condensation and reduce unwanted noise. This solution works in conjunction with ceiling insulation to provide thermal and acoustic performance.	✓		✓		✓
Sisalation® Vapawrap® Vapour Permeable Metal Roof and ventilation drainage batten	5 6 7 8		A solution that utilises a vapour permeable membrane and higher R-value ceiling insulation in roof spaces. This solution is effective in managing water vapour particularly in colder climates.		✓			✓

NCC climate zones

Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
Zone 7
Zone 8

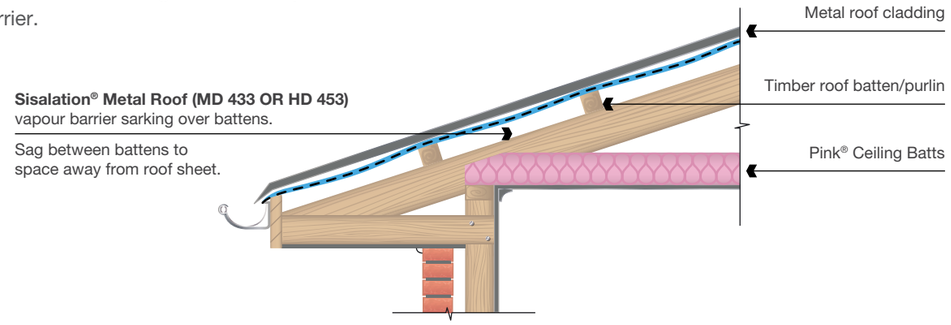

Standard pitched residential metal roof.

Recommended roofing and ceiling insulation solutions for residential pitched metal roofs

Sisalation® Metal Roof (MD 433 or HD 453) sarking solution

Sisalation® Metal Roof (MD 433 or HD 453) reflective foil sarking solution (non-vapour permeable membrane) with higher R-value ceiling insulation to provide a radiant heat barrier.

Climate zones 1 2 3 4 5 6*



*Suitability of product for colder climates such as climate zone 6 needs to be confirmed with the building designer. Where Sisalation® Metal Roof sarking is used, adequate roof ventilation must be provided to minimise condensation occurring within the roof space, refer to state based variations in the NCC for any specific regional requirements.

Sisalation® Metal Roof sarking solution is important in mild to warmer climates where water vapour management is critical in the building – working effectively with higher R-value ceiling insulation to achieve the overall thermal and acoustic ceiling performance required.

This solution provides an effective approach to managing condensation in the roof space by creating a vapour barrier. The barrier stops vapour and moisture from passing through the fabric allowing vapour to escape through the ventilated cavity.

In addition, the water and vapour barrier property of Sisalation® Metal Roof sarking performs two functions: it prevents water and vapour from transferring into the building; and limits the ingress of liquid water and dust from the external environment.

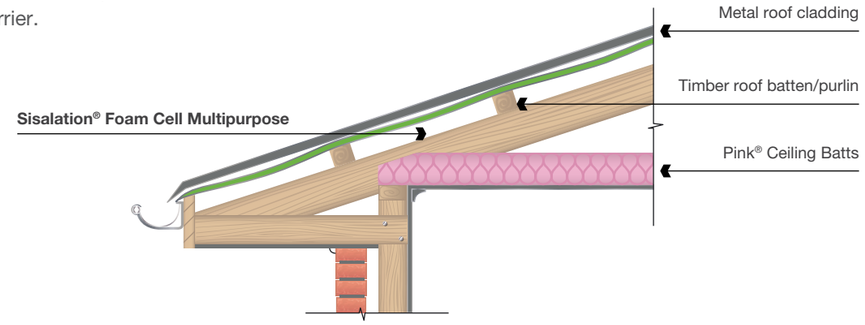
Sisalation® Metal Roof (MD 433/HD 453) features and benefits

Protection: A defensive secondary layer that helps minimise wind driven rain and dust entering the roof space
R-value thermal performance: Improves thermal performance by reflecting up to 97% of radiant heat in the roof and provides R-value from the reflective surface. Helps reduce energy costs for building, consequently lowering energy consumption in the home and decreasing heat loads on ceiling ducts and equipment, allowing systems to work more efficiently.
Suitable for BAL fire regions: Achieves a low Flammability Index of <5 in accordance with AS 1530.2, making it suitable for use in bushfire areas, BAL Low–40 in accordance with AS 3959.

Sisalation® Foam Cell Multipurpose metal roofing solution

Sisalation® Foam Cell Multipurpose metal roofing solution with higher R-value ceiling insulation to provide a radiant heat barrier.

Climate zones 1 2 3 4 5 6*



*Suitability of product for colder climates such as climate zone 6 needs to be confirmed with the building designer. Where Sisalation® Foam Cell Multipurpose metal roof sarking is used, adequate roof ventilation must be provided to minimise condensation occurring within the roof space, refer to state based variations in the NCC for any specific regional requirements.

Sisalation® Foam Cell Multipurpose metal roofing solution is specifically designed for warmer Australian regions to help stop vapour, water and wind entering the building, act as a thermal break and provide additional R-values. The reflective foil and foam cell attribute manages condensation and delivers a thermal break, whilst the >R3.5 higher value ceiling insulation provides optimal thermal and acoustic performance.

Offering a 3-in-1 reflective sarking insulation featuring a closed cell foam core combined with a layer of reflective foil laminate.

Its advanced thermal performance reflects up to 97% radiant heat, allowing for cooler internal conditions in hot and humid climates. With a material R-value of R0.25 it's deemed suitable for use as a thermal break for steel framed constructions in accordance with NCC requirements.

In addition, Sisalation® Foam Cell Multipurpose incorporates a 150mm reflective foil overlap, along one side edge, which minimises taping consequently saving time on installation. When installed correctly, this solution acts as an effective water and vapour barrier and will aid in minimising the risk of condensation.

Sisalation® Foam Cell Multipurpose features and benefits

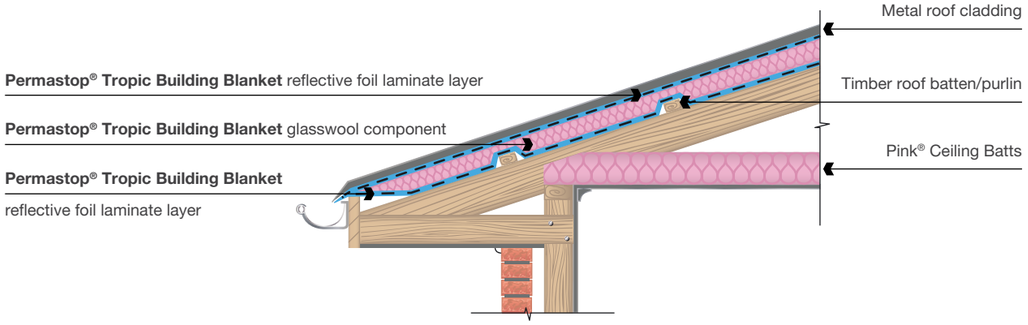
3-in-1 sarking solution: Provides an all in one effective insulation, thermal break, and vapour barrier.
Strong and durable Extra Heavy Duty rating: The Extra Heavy Duty rating in accordance with Table 1 of AS 4200.1, provides maximum strength, durability and increased tear resistance. This allows the product to be used as a sarking in residential applications as per 3.5.2.4 of the NCC 2019.
Thermal R-value performance: Suitable as a thermal break in steel-framed construction in accordance with NCC requirements.
Closed cell foam core product composition: Fibre free and non-allergenic insulation.
Suitable for use in BAL zones: Achieves a low Flammability Index of <5 in accordance with AS 1530.2, making it suitable for use in bushfire areas, BAL Low–40 in accordance with AS 3959.

Recommended roofing and ceiling insulation solutions for residential pitched metal roofs

Permastop® Tropic Building Blanket metal roofing solution

Permastop® Tropic Building Blanket metal roofing solution (dual foil faced building blanket) with ceiling insulation.

Climate zone 1



The Permastop® Tropic Building Blanket metal roofing solution offers effective direct under roof insulation for controlling temperature, reducing external noise and protecting against condensation – specifically designed for hot humid climates. It works in conjunction with ceiling insulation to provide the overall required thermal and acoustic performance. In relation to condensation, the solution minimises the risk of the system reaching dew point. It is recommended the appropriate ventilation strategy is adopted to remove excessive water vapour from the system.

Permastop® Tropic Building Blanket is a combination of bulk glasswool and two layers of foil facing insulation that provides thermal, acoustic and condensation protection benefits in a single product.

The light duty antiglare sarking on the topside (installed facing outward toward the metal roof cladding) acts as a vapour barrier. The heavy duty reflective facing foil layer on the underside of the blanket (installed facing downward into the ceiling space) helps lower the rising heat exiting from the inside of the home when warm internal air attempts to relocate to a cool place. This foil facing layer is also insulated from the cold metal cladding by the Pink® Building Blanket (bulk glasswool) insulation, which absorbs unwanted external sounds and considerably reduces heat transmission in and out of a home.

It is important to note that Permastop® Building Blanket does not offer ventilation between the metal roof cladding and the bulk glasswool insulation layer.

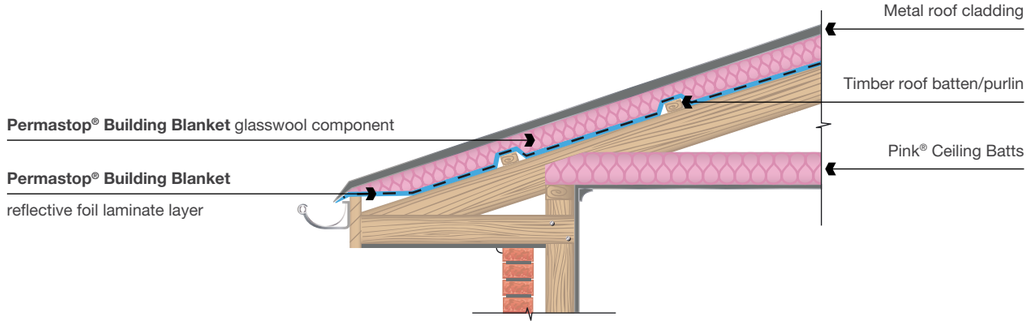
Permastop® Tropic Building Blanket features and benefits

Dual Reflective foil layers: Reflecting heat away from the insulation system, preventing the humid warm air from creating condensation and keeping the home cool all year round.
Thermal R-value performance: Improves thermal performance by reflecting radiant heat away from the roof and provides additional R-value from the reflective surface. Helps reduce energy costs and provides increased comfort to the home, consequently lowering energy consumption in the home and decreasing heat loads on ceiling ducts and equipment, allowing systems to work more efficiently.
Acoustic advantage: The installation of Permastop® Tropic directly under the metal roof sheet can significantly reduce unwanted external noise inside a building caused by urban landscape and weather conditions, improving the comfort of a home's living environment as well as providing thermal and condensation benefits.
Suitable for use in BAL zones: Achieves a low Early Fire Hazard Smoked Developed Index of 2 in accordance with AS/NZS 1530.3, making it suitable for use in bushfires areas, BAL Low–40 in accordance with AS 3959.

Permastop® Building Blanket metal roofing solution

Permastop® Building Blanket metal roofing solution (foil faced building blanket) with ceiling insulation.

Climate zones 2 3 4 5 6 7 8



The Permastop® Building Blanket metal roofing solution offers effective direct under roof insulation for controlling temperature, reducing external noise and managing condensation. It works in conjunction with ceiling insulation to provide the overall required thermal and acoustic performance. In relation to condensation, the solution minimises the risk of the system reaching dew point. It is recommended the appropriate ventilation strategy is adopted to remove excessive water vapour from the system.

Permastop® Building Blanket is a combination of bulk glasswool and a layer of reflective foil facing insulation (sarking) that provides thermal, acoustic and condensation protection benefits in a single product.

The reflective foil sarking on Permastop® Building Blanket (installed facing downward into the ceiling space) helps lower the rising heat exiting from the inside of the home when warm internal air attempts to relocate to a cool place. This foil facing layer is insulated from the cold metal cladding by the bulk glasswool insulation (Pink® Building Blanket), which absorbs unwanted external sounds and reduces heat transmission in and out of a home considerably.

It is important to note that Permastop® Building Blanket does not offer ventilation between the metal roof cladding and the bulk glasswool insulation layer.

Permastop® Building Blanket features and benefits

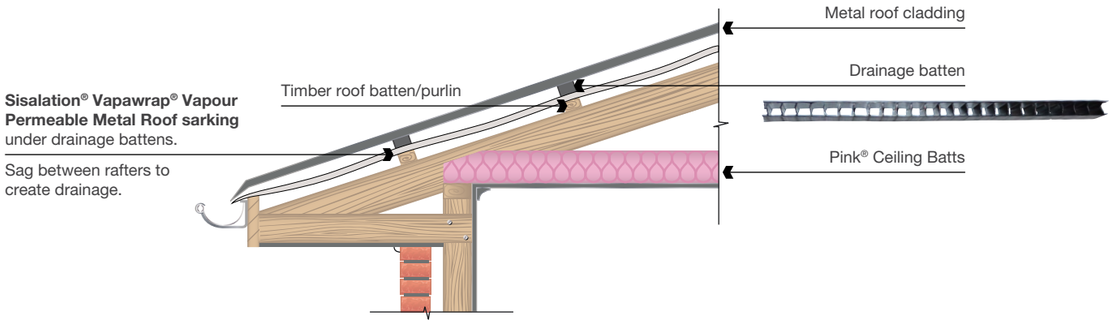
Thermal R-value performance: Improves thermal performance by reflecting radiant heat away from the roof and provides additional R-value from this reflective surface. Helps reduce energy costs and provides increased comfort to the home, consequently lowering energy consumption in the home and decreasing heat loads on ceiling ducts and equipment, allowing systems to work more efficiently.
Acoustic advantage: The installation of Permastop® directly under the metal roof sheet can significantly reduce unwanted external noise inside a building caused by urban landscape and weather conditions, improving the comfort of a home's living environment as well as providing the thermal and condensation benefits.
Suitable for use in BAL zones: Achieves a low Early Fire Hazard Smoked Developed Index of 2 in accordance with AS/NZS 1530.3, making it suitable for use in bushfires areas, BAL Low–40 in accordance with AS 3959.

Recommended roofing and ceiling insulation solutions for metal roofs

Sisalation® Vapawrap® Vapour Permeable Metal Roof solution

Sisalation® Vapawrap® Vapour Permeable Metal Roof solution and higher R-value ceiling insulation to manage internal moisture.

Climate zones 5 6 7 8



Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking combined with the drainage batten solution provides an effective approach to managing condensation in the roof space by permitting moisture to pass through the fabric as vapour and escape through the ventilated roof cavity. This solution works effectively with higher R-value (>R4.1) ceiling insulation to achieve the overall thermal and acoustic ceiling performance solution.

The installation of a drainage batten over the Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking provides an independent separated space between the metal cladding and the Sisalation® Vapawrap® sarking, effectively reducing the risk of condensation by allowing an unobstructed drying path for the condensate to drain away into the gutter.

The vapour permeability property of Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking performs two functions: it allows moisture to escape from within a building; and limits the ingress of liquid water and dust from the external environment.

This is particularly important in colder climates where water vapour management is critical in the building envelope.

Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking features and benefits

High vapour permeance: Classified as a Class 4 Vapour Permeable Roof Sarking in accordance with AS 4200.1, this reduces the likelihood of condensation build up that may result in mould growth potentially damaging roof or ceiling space inside homes.

Water barrier: Aids to keep out water ingress caused by wind driven rain into the roof cavity. Classified as a Water Barrier in accordance with AS/NZS 4201.4, infers it can assist in lowering the likelihood of damage to the home associated with unwelcomed weather conditions and events.

Suitable for use in BAL zones: Achieves a low Flammability Index of <5 in accordance with AS 1530.2, making it suitable for use in bushfires areas, BAL Low–40 in accordance with AS 3959.

Residential metal roof.

Which roof solution is suitable for my residential project?

For new build construction, the NCC stipulates the performance requirements relative to the climate zone where the building is located. The systems presented in this solution guide meet the requirements of the NCC for the respective climate zones. Any of the systems can be used in the respective climate zone and it is up to the builder, installer or end user as to which system is selected.

Where roof construction is outside of a traditional pitched roof these systems are more complex in design and thermal, acoustic and condensation management considerations. Fletcher Insulation can assist with selection of components to meet NCC requirements.

Where systems are being selected for renovation projects, it is recommended to follow the NCC as a guide. However, selection will be driven by the builder or homeowner.

Roof sarking is categorised either according to its reflective properties or its vapour permeability. The reflective properties determine the thermal benefits of the product and vapour permeability establishes the capability of the sarking to manage the movement of water vapour and effect on condensation management in buildings.

Choosing the most suitable roof sarking is determined by construction type, the climate zone region and the quantity of roofing blanket (for metal roofs) and ceiling insulation being used on the project.

Whilst thermal insulation properties can be well managed with the inclusion of bulk insulation, the major variable that roof sarking manages in a home is condensation. This includes the handling of water vapour from either outside (in humid regions) or inside (in cooler regions where the interior is heated most of the time).

The selection of the most suitable roof sarking is essential to safeguarding the energy efficiency of any building and the long-term wellbeing of its occupants.

The information provided here can be used as a guide in selecting the right roof sarking. For further information or specific detail related to your project contact the Fletcher Insulation Technical team.

What happens if my project has a specified system and I need to change it for another roof configuration?

For retrofit or renovation projects, check with the homeowner if there are thermal requirements. Fletcher Insulation can quickly assist in delivering a configuration that will provide the same thermal benefits as the system selected.

For a new building project, the builder may need to update the proposed products in their energy rating model to confirm suitability of products to meet requriements of building codes.

Residential roofing project with Sisalation® Vapawrap® Vapour Permeable Metal Roof solution installed.

Install considerations

Permastop® Building Blanket and Permastop® Tropic Building Blanket

When Permastop® Building Blanket or Permastop® Tropic Building Blanket solutions are being installed, they should be installed over the battens, ensuring the bulk insulation is continuously in contact with the underside of the roof sheeting. Permastop® Building Blanket may be laid ridge to gutter or parallel to gutter. Where Permastop® Building Blanket and Permastop® Tropic Building Blanket solutions are used, please refer to the Permastop® Building Blanket and Permastop® Tropic Building Blanket Installation Guide.

Sisalation® Metal Roof sarking, Sisalation® Foam Cell Multipurpose and Sisalation® Vapawrap® Vapour Permeable Metal Roof

Where roof sarking or foam cell type solutions are used please refer to the Sisalation® Pliable Building Membranes and the Sisalation® Foam Cell Installation Guide. Unless the Fletcher Insulation drainage batten is used, it is deemed best practice to install roof sarking parallel to the eaves (horizontal roll-out) and lay under the battens to allow water to flow down the lap joints and provide a drainage channel between the roof sheet and the sarking. Installation should always be in accordance with AS 4200.2. Fletcher Insulation provides a drainage batten that can be used in these applications. The drainage batten product information sheet is available at insulation.com.au

For comprehensive installation advice, refer to the Fletcher Insulation product installation guidelines for ecommendations suitable for residential metal roofs, available at insulation.com.au. Always check the suitability of the roofing solution with your metal roof cladding manufacturer.

Limitations

- Product recommendations suitable for residential building projects only.
- Not all products in this solutions guide are recommended for commercial roofing applications. Please refer to the commercial roofing product selection guide available at insulation.com.au.
- Subject to assessment of the relevant energy modelling.

Require additional information?

Fletcher Insulation offers a range of technical services including thermal system predictions and condensation modelling for specific and climate applications, together with product and project technical support. For all your online specification tool needs, Fletcher SpecPro is also available at insulation.com.au/tools/fletcherspecpro/. For more information, please contact Fletcher Insulation on 1300 654 444 or technical@insulation.com.au

Residential metal roof.

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