

ROOFING  
INSULATION  
ALTERNATIVES FOR  
UNCONDITIONED  
WAREHOUSE  
METAL ROOF  
APPLICATIONS



## Commercial warehouse roofing insulation for metal roofs

Product Solutions Guide: Designed for unconditioned spaces



unconditioned plane hangar.

## 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.

## Insulation selections for metal roof applications in commercial unconditioned warehouses

Selecting the right insulation for commercial warehouses is predominantly driven by the requirements of the National Construction Code of Australia 2019 (NCC) and is dependent on building type and use in relation to energy, fire and acoustic provisions. Unconditioned commercial warehouses do not require a total system R-value but are subject to fire resistance requirements. This guide is specifically designed for roofing insulation in unconditioned commercial warehouses with metal roofs to apply best practice using Fletcher Insulation's recommended solutions as a guide only.

### Designing for energy provisions

A key driver in meeting the energy provisions of the NCC relates to the function and use of the building, the level of human comfort required for the building use and the energy usage/source of the building.

Where unconditioned buildings are without air-conditioning or mechanical temperature control these buildings do not need to meet the higher energy saving provisions required by Section J of the NCC. Nonetheless, it is good practice to provide some form of insulation for thermal resistance. The key design considerations are:

- Human comfort (providing thermal resistance against higher heat loads coming in during summer and going out in winter).
- Unconditioned/non-temperature-controlled space usage such as for bulk storage.

It is important to note that where offices form part of a warehouse, this area may be required to meet Section J of the NCC requiring a different insulation design approach which can directly impact the wellbeing of the occupants.

Where buildings are conditioned, higher levels of insulation are required to meet the performance levels in Section J of the NCC. For this building type and use, please refer to the Fletcher Insulation Commercial Roofing Product Selection Guide, Designing for NCC 2019.

### Designing for fire resistance

The NCC requires commercial buildings to have levels of fire resistance depending on the application, in both conditioned and unconditioned spaces. Fire-rated performance should be the governing factor when selecting roofing insulation products presented in this guide, which all offer a level of fire resistance. Consult the NCC for the specific fire performance requirements for your project. Typically, in these types of buildings where the insulation layer becomes the ceiling lining, the group rating is critical in selection of appropriate insulation.

### Designing for acoustics

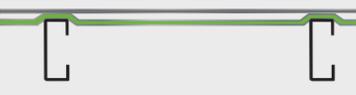
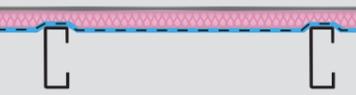
The NCC generally sets out provisions for acoustics in buildings, however for unconditioned warehouses the NCC does not provide any requirements for acoustic performance. Despite there being no NCC requirements for acoustic performance in unconditioned commercial warehouses, some form of roofing insulation for acoustic performance is recommended to help reduce machinery noise and noise from rain falling on the roof.

### Further information

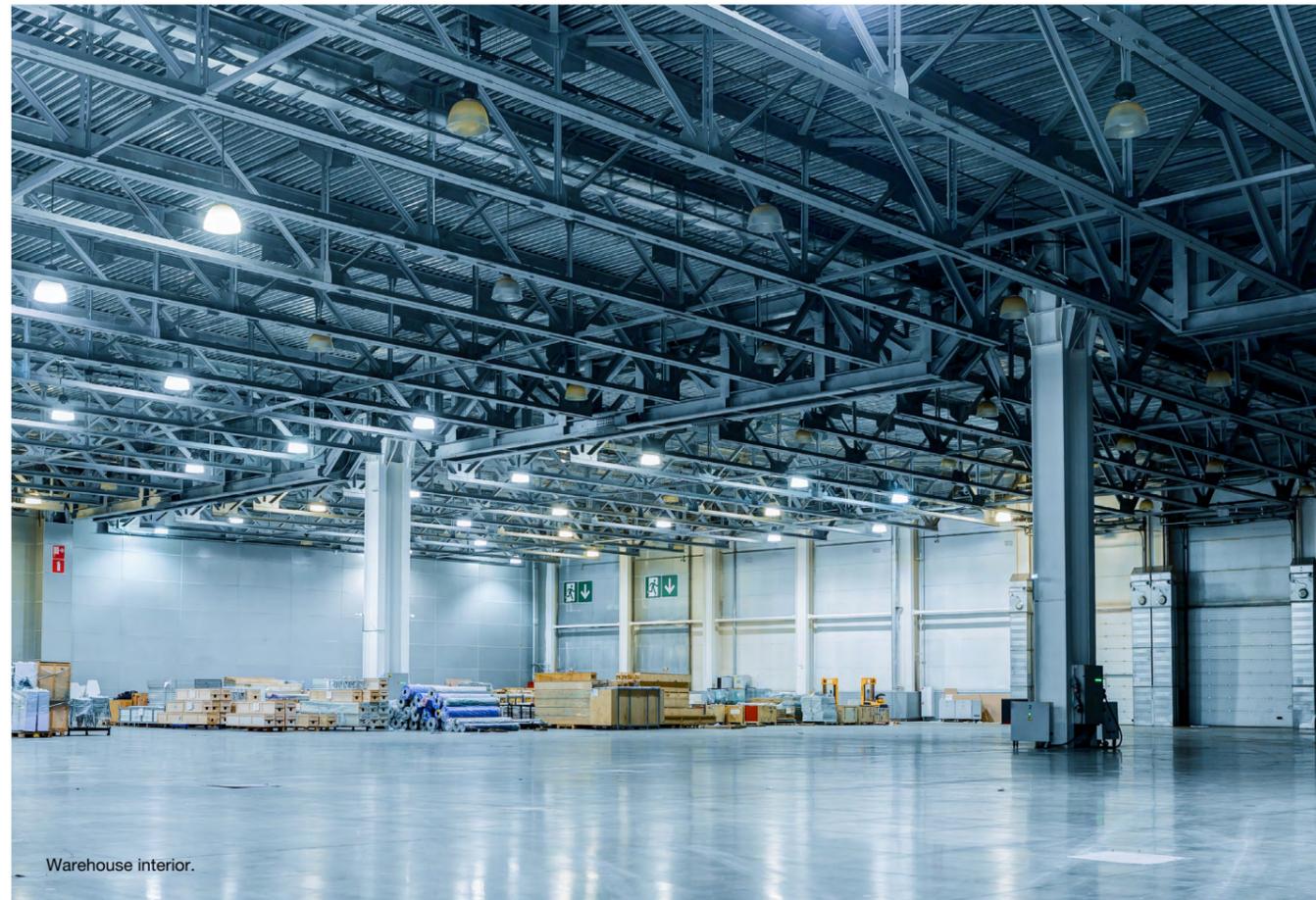
The solutions provided in this guide will need to be confirmed against the design requirements of the intended use of the building. Contact Fletcher Insulation for advice on suitable products and systems for specific design applications. Please check with your building designer to ensure all performance requirements are met in the selection of insulation materials.

## 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 roofs in commercial unconditioned warehouses. 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	System diagram	Solution explained	Total R-value		Acoustic performance	Fire resistance	Vapour barrier	Provides additional R-value	Thermal break	BAL compliant
			Summer R <sub>T</sub> with 40mm air space R <sub>T</sub> = 1.95 R <sub>T</sub> without 40mm air space R <sub>T</sub> = 1.4	Winter R <sub>T</sub> with 40mm air space R <sub>T</sub> = 0.87 R <sub>T</sub> without 40mm air space R <sub>T</sub> = 0.47						
Sisalation® Foam Cell Multipurpose		Sisalation® Foam Cell Multipurpose is an NCC fire rated compliant solution that provides thermal, acoustic and condensation management benefits, significant installation efficiencies and can be used as a thermal break.			Not available	Group 2 AS 1530.2 AS/NZ 1530.3	✓	✓	✓	✓
Permastop® Building Blanket		Permastop® Building 55mm Blanket is an NCC fire rated compliant solution that allows for higher total system R-values as well as acoustic performance and condensation management benefits.	Summer R <sub>T</sub> = 1.49	Winter R <sub>T</sub> = 0.98	RW 24db*	Group 1 Light Duty Group 2 Medium and Heavy Duty AS/NZ 1530.3	✓	✓		✓

**Note:** Total R-value provided as a guide only, based on INSUL v9 and custom orb roof sheet and not for design or compliance with NCC. Total R-value is based on full recovery of the blanket between underside of roof sheeting and safety mesh.  
\*Acoustic values based on Permastop R1.3 55mm with custom orb roof sheet.



## Recommended roofing insulation solutions for commercial unconditioned warehouse metal roofs

### Sisalation® Foam Cell Multipurpose metal roofing solution



The Sisalation® Foam Cell Multipurpose metal roofing solution meets the fire performance requirements of the NCC and is designed to also provide thermal and acoustic benefits and help stop vapour, water and wind entering the building. Complying with AS 1530.2, AS/NZS 1530.3 and AS 5637.1 with a Group 2 fire rating, it is suitable for use as an exposed wall or ceiling lining.

Sisalation® Foam Cell Multipurpose is a 3-in-1 reflective sarking insulation incorporating a closed cell foam core encapsulated between an upper and lower layer of reflective foil laminate. An anti-glare coating is applied to one side of the composite to reduce the level of glare experienced during installation.

Reflecting up to 97% radiant heat, Sisalation® Foam Cell Multipurpose allows for cooler internal conditions in hot and humid climates and minimises the risk of condensation. During winter, heat generated in the building is reflected back inside so the building feels warmer. With a material R-value of R0.25, it is deemed suitable for use as a thermal break for steel framed constructions in accordance with NCC requirements.

Sisalation® Foam Cell Multipurpose incorporates a 150mm reflective foil overlap along one side edge providing significant installation efficiencies. The overlap minimises the need to tape joints and allows for sealed edge protection, improving aesthetics in exposed applications. Overall, it maximises coverage, saves on installation time, reduces wastage and provides cost savings.

#### 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 commercial applications as per F1.6 of the NCC 2019.

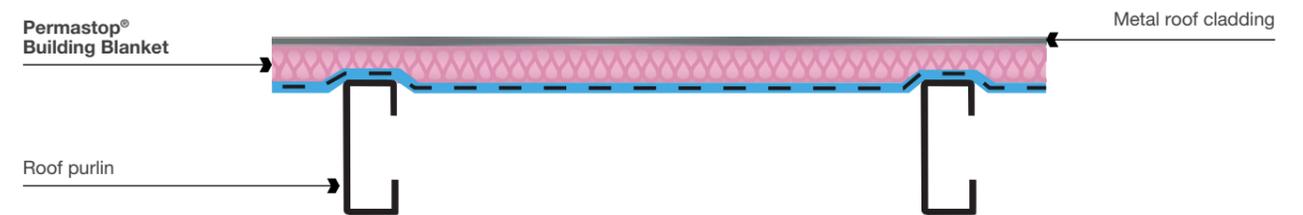
**Thermal R-value performance:** Suitable as a thermal break in steel-framed construction in accordance with NCC requirements.

**Closed cell foam core product composition:** Fibre free and non-allergenic insulation.

**Meets fire performance requirements:** Achieves a low Flammability Index of <5 in accordance with AS 1530.2 and achieves a low Early Fire Hazard Smoked Developed Index of 1 in accordance with AS/NZS 1530.3.

**Reflective foil overlap (along one side edge):** Provides significant installation efficiencies and minimises wastage.

### Permastop® Building Blanket metal roofing solution (foil faced building blanket)



The Permastop® Building Blanket metal roofing solution meets the fire performance requirements of the NCC and is an effective direct under roof insulation that provides thermal and acoustic performance and helps manage condensation.

It is suitable for use as an exposed wall or ceiling lining in an unconditioned warehouse application as it complies with AS 5637.1: the Light Duty Permastop® Building Blanket has a Group 1 fire rating; the Medium and Heavy Duty Permastop® Building Blankets have a Group 2 rating. In addition, Permastop® Building Blanket also complies with AS/NZS 1530.3 achieving a low Early Fire Hazard Smoked Developed Index of 2.

Permastop® Building Blanket is a combination of bulk glasswool and a layer of reflective foil facing insulation (sarking) in a single product. The reflective foil installed facing downward helps lower the rising heat exiting from the inside of the building. The bulk glasswool insulation (Pink® Building Blanket) absorbs unwanted external sounds in and out of a commercial warehouse considerably.

#### 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 the reflective surface. Helps provide increased comfort to the warehouse occupants.

**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 working environment.

**Meets fire performance requirements:** Achieves a low Early Fire Hazard Smoked Developed Index of 2 in accordance with AS/NZS 1530.3 and achieves a Group 1 fire rating (Light Duty blanket) in accordance with AS 5637.1.

## Which solution is suitable for my commercial unconditioned warehouse?

For new build construction, the NCC sets out the performance requirements of the roofing system. For unconditioned buildings the primary selection driver is fire performance, however, a building designer should be consulted to ensure any product selected will be suitable for the application.

Where buildings or part of buildings are to be conditioned or temperature controlled the NCC has thermal provisions that need to be met. Refer to the Fletcher Insulation Commercial Roofing Product Selection Guide, Designing for NCC 2019 for further information and consult your building designer for further information.

Where systems are being selected for refurbishment projects, it is recommended to follow the NCC as a guide, but selection will be driven by the builder or building occupant.

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

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

For a new build project, the builder may need to check with the building designer that the proposed products comply with the design intent and the NCC.

## Install considerations

### Sisalation® Foam Cell Multipurpose

When choosing the Foam Cell Multipurpose solution please refer to the Sisalation® Foam Cell Installation Guide. It is deemed best practice to install Sisalation® Foam Cell as a continuous membrane, anti-glare side facing out and laid with a maximum sag allowable by the safety mesh between purlins. Joins must be overlapped to facilitate drainage by using the 150mm flap. The roof sheet may be fixed by screwing through Sisalation® Foam Cell into the purlin. Installation should always be in accordance with AS 4200.2.

### Permastop® Building Blanket

Where Permastop® Building Blanket solutions are used, please refer to the Permastop® Building Blanket Installation Guide. Permastop® Building Blanket should be laid over the purlins (reflective surface to face inwards into the air-space below) in the same manner as the wire mesh. The foil lap on Permastop® Building Blanket allows joins to be concealed. For ease of installation, each consecutive roll shall be laid over the lap ensuring the glasswool is butted firmly against the adjacent roll. Fix metal decking to purlins with fasteners using a suitable insulation spacer to allow the blanket to recover to its nominal thickness when thermal performance is required for the building.

For comprehensive installation advice refer to the Fletcher Insulation product installation guidelines for recommendations suitable for commercial metal roofs, available at [insulation.com.au](http://insulation.com.au). Always check the suitability of the roofing solution with your metal roof cladding manufacturer.

## Limitations

Product recommendations suitable for commercial unconditioned warehouse applications only.

## 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/fletcher-specpro/](http://insulation.com.au/tools/fletcher-specpro/). For more information, please contact Fletcher Insulation on 1300 654 444 or [technical@insulation.com.au](mailto:technical@insulation.com.au)



Warehouse interior.



Plane hangar with flat metal roof.



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