Fletcher Insulation
Building Better, Together

Technical Bulletin

31 October 2021

Sisalation® Vapawrap® Vapour Permeable Metal Roof – Effective Condensation Management 2

Condensation management in NCC 2019

With the new condensation management clause in the current NCC, there has been a shift towards more passive condensation control within Australian design. The *Condensation in Buildings – Tasmanian Designers' Guide – Version 2* (Tasmanian Designers' Guide hereafter) was published after a few years of research conducted by Professor Mark Dewsbury and the team from University of Tasmania. This research was accepted into the NCC 2019 as suitable condensation management construction for Tasmania. To our knowledge, this approach is also suitable for most temperate and cold climates in Australia. Fletcher Insulation fully supports the condensation management for residential buildings such as Class 1 according to NCC 2019 and the Tasmanian Designers' Guide.

In this document, Fletcher Insulation presents an option for effective condensation management under pitched residential (Class 1) metal roofs, that is in addition to the option presented in the recently released Technical Bulletin: Permastop® Building Blanket for effective condensation management.

As communicated in the *Condensation in buildings Handbook* published by ABCB, the clear night sky or radiative cooling can cause the metal roof cladding temperature to drop lower than its surrounding air at night, thus causing condensation to possibly form underneath the roof cladding in many Australian climates.

To manage this type of condensation, Fletcher Insulation recommends Sisalation® Vapawrap® Vapour Permeable Metal Roof for typical metal roof Class 1 building construction as one of the options to manage such situations – in conjunction with using the sarking under battens installation method highly recommended in the Tasmanian Designers' Guide.

Sisalation® Vapawrap® Vapour Permeable Metal Roof

This is a lightweight, flexible water barrier and water vapour permeable membrane (sarking). It is generally used underneath the metal roof, allowing water vapour to escape from the roof structure and simultaneously preventing water generated through condensation from dripping into the roof space.

Sarking under batten and sarking under drainage batten installation methods

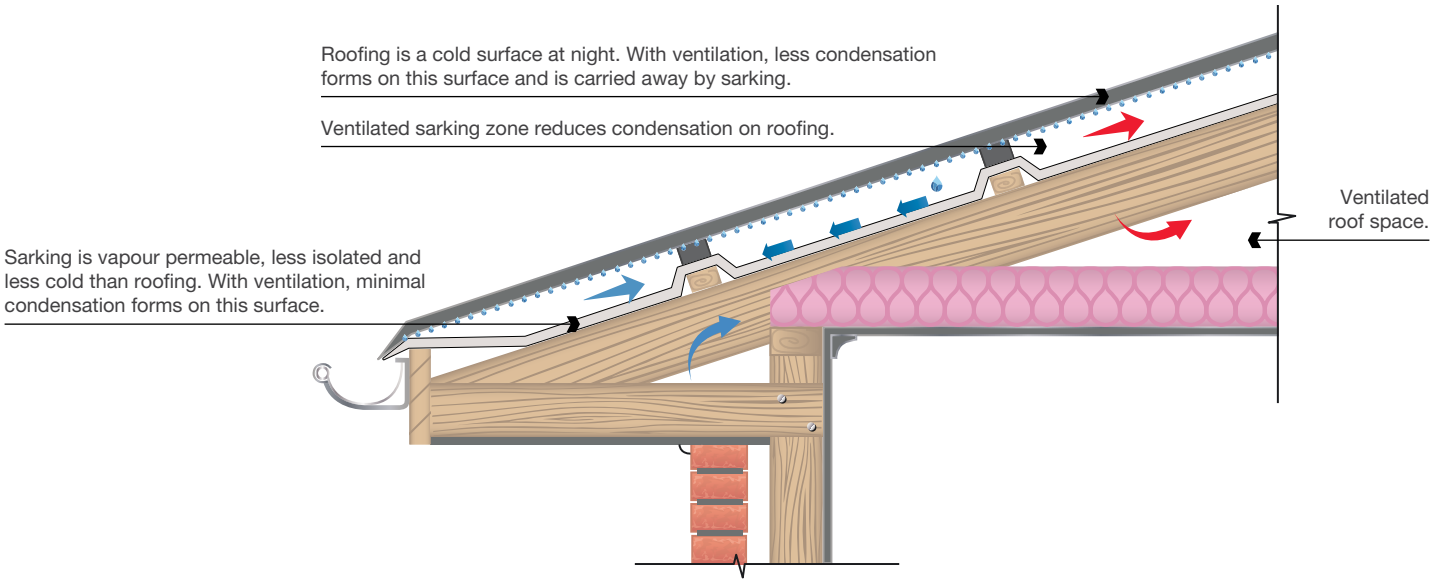
To install Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking correctly, and in line with best practice methods, the Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking material should be either installed parallel to the eaves (horizontal roll-out) and laid taut underneath the roof battens. This install method is suitable with or without the drainage batten.

Alternatively, if laying from ridge to gutter (vertical roll out), the Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking should be installed with the inclusion of the drainage batten. Lay the Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking over the timber batten, with the drainage batten installed on top of the Sisalation® Vapawrap® Vapour Permeable Metal Roof sarking to create a minimum of 10mm air gap. Fletcher Insulation recommends both of these effective methods, 'sarking under batten' installation or 'sarking under the drainage batten' installation to provide an adequate ventilation pathway minimising condensation risks.

Fletcher Insulation recommends suitably designed natural or mechanical ventilation for the roofing system and an increase in ceiling insulation to compensate for the loss of thermal and acoustic insulation.

Sarking under batten installation/sarking under the drainage batten installation benefits

Sarking under batten installation/sarking under the drainage batten installation minimises thermal bridging. With ventilation in the sarking zone and the roof space, these conditions combined will minimise condensation in the roof space. The Sisalation® Vapawrap® Vapour Permeable Metal roof sarking can be installed prior to the battens being installed and an extra counter batten can also be installed on top of the batten for better ventilation/wider air gap if desired. Alternatively, add one or two layer drainage battens before the roof cladding is installed.



In the unlikelihood of condensation occurring beneath the metal roof cladding, this solution:

- Provides a venting pathway above and below the membrane to allow moisture to escape from the roof system and protect the roof structure.
- Allows condensates to drain into the gutter.
- Functions as a water barrier, preventing water from dripping through the membrane.

Acoustic and thermal performance considerations

Fletcher Insulation recommends higher R-value ceiling insulation to meet the NCC 2019 energy efficiency requirements as well as provide appropriate acoustic performance for the comfort of occupants.

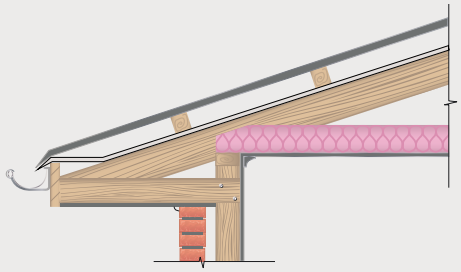
The following page has a table of example thermal calculations comparing Sisalation® Vapawrap® Metal Roof with Permastop® Building Blanket.

Thermal calculations: Comparative tables

Climate zone: 5 **Building Class:** 1A **Heat Flow:** Winter

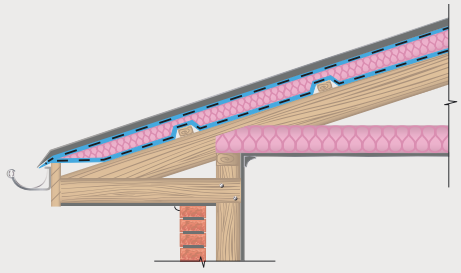
Sisalation® Vapawrap® Vapour Permeable Metal Roof solution:

Fletcher Insulation Sisalation® Vapawrap® Metal Roof, 195mm Pink® Batts R4.1 installed at ceiling level with 10mm Plasterboard. Values are calculated for a roof without thermal bridging consideration as per NCC 2019 Class 1 building.

System diagram	Name	Winter	Summer
	Outdoor air-film	0.040	0.040
	Metal roof	0.000	0.000
	Roof pitch 6°–22.5°	0.000	0.000
	40mm air-space	0.168	0.194
	Sisalation® Vapawrap® Metal Roof	0.000	0.000
	Unventilated air-space	0.180	0.280
	195mm Pink® Batts R4.1	4.310	3.924
	10mm plasterboard	0.059	0.059
	Indoor air-film	0.110	0.160
	Total system R-value	**4.867**	**4.656**
	DTS requirement	**4.100**	

Permastop® Building Blanket Roofing Solution:

Fletcher Insulation 55mm Permastop® Building Blanket R1.3, with foil side facing down, roof battens to allow for blanket to recover to nominal thickness. 130mm Pink® Batts R2.5 installed at ceiling level with 10mm plasterboard. Values are calculated for a roof without thermal bridging consideration as per NCC2 019 Class 1 building.

System diagram	Name	Winter	Summer
	Outdoor air-film	0.040	0.040
	Metal roof	0.000	0.000
	Roof pitch 6°–22.5°	0.000	0.000
	55mm Permastop® Building Blanket R1.3	1.385	1.203
	25mm roof battens	0.000	0.000
	Unventilated air-space	0.560	1.090
	130mm Pink® Batts R2.5	2.611	2.428
	10mm plasterboard	0.059	0.059
	Indoor air-film	0.110	0.160
	Total system R-value	**4.766**	**4.980**
	DTS requirement	**4.100**	

For the above two system examples, it is expected to have the same or similar noise reduction benefit for occupants as splitting the insulation across the roof and the ceiling will have a similar acoustic performance to the single layer on the ceiling.

This information is a guide for one type of condensation management option only. For all other NCC compliant options, please consult the NCC 2019 or the Tasmanian Designers' Guide where appropriate.

References

NCC 2019, Volume 1 and 2, published by the Australian Building Codes Board (ABCB).

Condensation in Buildings – Tasmanian Designers' Guide – Version 2, 2019, published by Tasmanian Government, Consumer, Building and Occupational Services Department of Justice.

Condensation in buildings Handbook, Commonwealth of Australia and States and Territories 2019, published by the Australian Building Codes Board (ABCB).

Important note

Correct installation is as important as the properties of the product in managing condensation. Please refer to the Sisalation® Vapawrap® Membrane and Permastop® Building Blanket Installation Guide and AS 4200.2 for details.

For more information please email the Fletcher Insulation technical team at technical@insulation.com.au

Fletcher Insulation
Building Better, Together