Fletcher Insulation

Building Better, Together

Commercial & Roofing Insulation

Product Selection Guide: Designing for NCC 2019

We are in the business of building

As a leading manufacturer to the Australian building industry, Fletcher Insulation has been at the forefront of insulation technology since the 1930's. With a national distribution footprint, we pride ourselves on providing excellent service to our customers. Our two manufacturing plants in Sydney and Melbourne 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.

Commercial Roofing Solutions

Whether you are designing or selecting materials for a commercial or industrial project, you can trust Fletcher Insulation to deliver the best insulation solution for your roofing applications.

The Fletcher Insulation range has been tested to Australian Standards and Australian conditions. Designed to meet the strict requirements of the latest National Construction Code (NCC), our products meet and exceed the NCC's deemed-to-satisfy requirements anywhere in Australia. Our specialist range of commercial roofing solutions ensure your project is covered, with the full backing of our experienced sales and support team.

Certified Product - AS/NZS4859.1
Global-Mark.com.au®
ID Number: 100577

bsi. ISO 9001 Quality Management

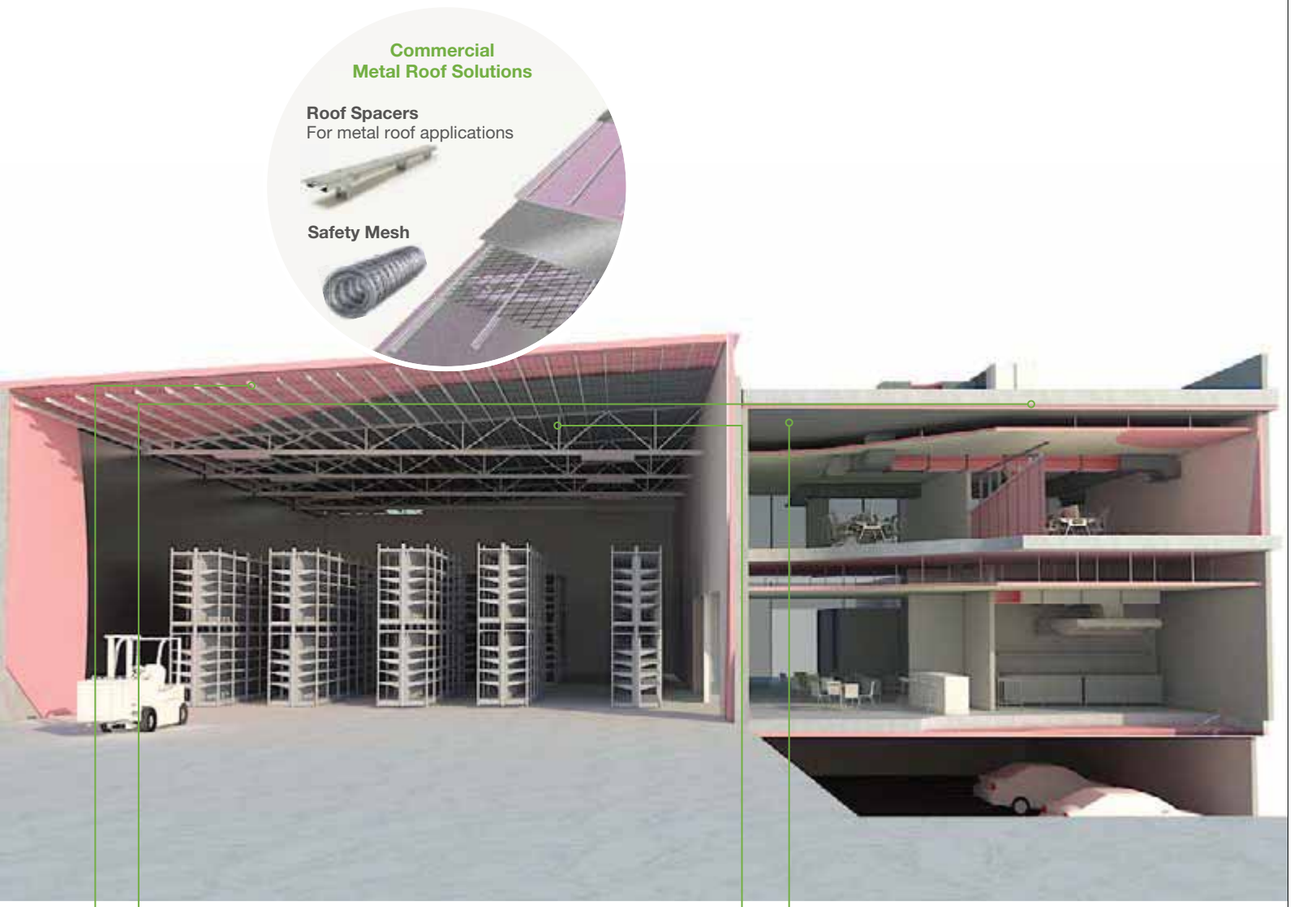
bsi. AS/NZS 4801:2001 Occupational Health and Safety Management

R4.5-1 GLASS WOOL
INSULATION

Fletcher Insulation was selected for the Jet Base, Melbourne. Fletcher Insulation was the ideal choice for thermal comfort and acoustic control. Noise minimisation and enhancing the Club member's experience was a key priority.

Contents

FLETCHER INSULATION BUILDING SOLUTIONS



Building Blanket

Pink® glass wool insulation delivers thermal performance and acoustic control for roof applications. Foil faced building blanket includes a building membrane with an effective water and vapour barrier for condensation control.

Building Membranes

Vapawrap™ vapour permeable membranes and foil faced membranes provide an effective water and vapour barrier for condensation control in roof applications.

COMMERCIAL ROOFING

Building Blankets

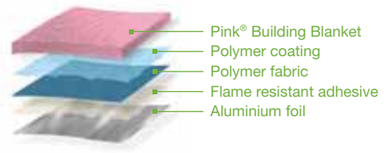
Insulation for roof lining applications

Pink® Building Blanket

Permastop® Building Blanket

Permatuff Building Blanket

Suitable behind internal wall or roof linings only (not for internally exposed applications)



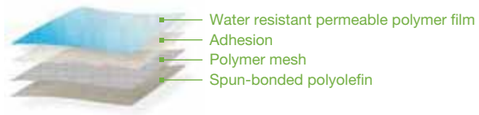
Features

- Thermal control
- Fire resistant
- Acoustic control
- Anti-glare
- Condensation control

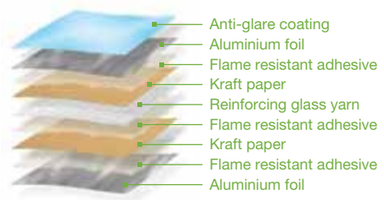
Building Membranes

Protects the building from moisture and vapour

Sisalation® Vapawrap™ Vapour Permeable Metal Roof

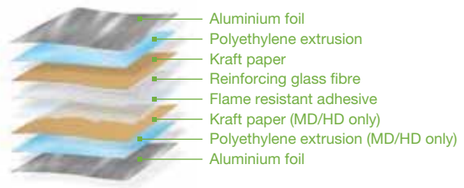


Sisalation® Metal Roof

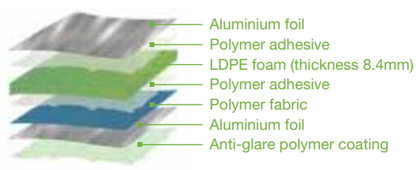


Sisalation® Facing Foil

For use in combination with Building Blanket



Sisalation® Foam Cell Multipurpose



Applications

- Metal roof insulation with facing
- Wall insulation with facing
- Under slab/soffit concrete roof insulation with facing
- Metal roof insulation
- Wall insulation
- Ceiling insulation
- Metal roof membrane
- Wall membrane
- Concrete roof membrane

A GUIDE TO CHOOSING THE RIGHT INSULATION

Good thermal comfort, daylight and acoustics – these factors play an important role in creating a healthy, productive workplace. Selecting the right insulation for the climatic conditions, building design and usage can have a significant impact on the comfort and well-being of occupants.

Fletcher Insulation has an extensive range of commercial roofing insulation solutions to suit your project and application.

1: DESIGNING FOR THERMAL PERFORMANCE

The right level of thermal performance can deliver better comfort levels as well as reducing the reliance on air conditioning and mechanical ventilation, which can significantly increase electricity costs for a property. Selecting the right type of roofing insulation can optimise the performance and energy efficiency of a commercial building, resulting in reduced heating and cooling costs.

R Values can be displayed as either a material value (Rm) or a total R-Value (Rt).

Material R Value (Rm) refers to the thermal resistance value that a product specifically delivers for a specified material such as building blanket. Rm is relative to the insulation thickness.

Total R Value (Rt) refers to all the elements of the overall roof system, taking into account air space, all materials used in the assembly fabrication of the building and the insulation material.

Most roofing insulation products combine a Glasswool blanket with a range of facing foils.

To assist in determining the most suitable product combination for your roofing project's application, it is advised firstly that the blanket thickness be established to satisfy the thermal material R value requirements and secondly to determine the facing foil which will offer the best level of condensation performance for your project application. Fletcher Insulation product complies with thermal performance (AS/NZS 4859.1). The Product Selector (page 8 to 15) will determine the most suitable product to meet National Construction Code 2019 deemed-to-satisfy requirements.

2: DESIGNING FOR ACOUSTIC CONTROL

Minimising noise is an important consideration when designing buildings. For projects located in high noise areas such as overhead traffic, under aircraft flight paths or for projects requiring high levels of acoustic control such as performing arts precincts and concert walls, Fletcher Insulation has a range of insulation and facing options with superior noise reduction properties. These solutions are ideal for noise control behind perforated ceilings by minimising sound transfer from the external roof environment.

3: DESIGNING FOR FIRE RESISTANCE

Fletcher Insulation glasswool products are non-combustible according to Combustibility AS1530.1-1994 (R2016). Sisalation® Building Membranes comply and meet the NCC Flammability Index AS1530.2-1993 (R2016). Compliance with Ignitability, Flame Propagation, Heat Release and Smoke Release AS/NZS1530.3-1999 (R2016). Fletcher Insulation has a range products for fire prone areas and designed to comply with Bushfire Attack Level (BAL) requirements of Low–40 in roof applications and Low–FZ in wall applications (in accordance with AS3959). In applications where the insulation is exposed and acts as the ceiling lining, Fletcher Insulation meets NCC compliance to AS ISO 9705 and AS5637.1-2015 Fire tests – Full-scale room test for surface products for Group 1 with Thermal Slab, NoiseSTOP and Permastop® light duty blanket products.

4: DESIGNING FOR CONDENSATION CONTROL

Sisalation® Building Membrane products have been developed to distinctively address condensation control in buildings and significantly reduce the likelihood of condensation developing underneath metal roofs.

In tropical regions (climate zone 1) Sisalation® products with an antiglare foil are recommended to further reduce condensation in increasingly humid conditions. The antiglare foil can be positioned in an upwards direction to allow installation toward direct sunlight.

Condensation control is an important consideration when designing commercial buildings in high humidity areas. Fletcher Insulation has a range of faced building blankets and building membrane solutions which provide a superior water and vapour barrier for long term durability against condensation.

Product	Description	Thermal (1)	Acoustic (2)	Fire Resistant (3)	Condensation Control (4) Vapour Classification
Unfaced Insulation Blanket					
Pink® Building Blanket	Pink® Building Blanket glasswool insulation is designed for metal clad roof and wall applications requiring superior thermal and acoustic properties.	Refer to page 8 to 15 for NCC 2019 requirements in your climate zone	n/a	Meets AS1530.1-1994 for non-combustibility	To be used in conjuction with building membrane to achieve condensation control
Foil faced Insulation Blanket					
Permastop® Building Blanket	Designed for commercial applications and suitable for large spans* Available as: • Sisalation® Light Duty (LD) 436 Facing Foil • Sisalation® Medium Duty (MD) 430 Facing Foil • Sisalation® Heavy Duty (HD) 450 Facing Foil	Refer to page 8 to 15 for NCC 2019 requirements in your climate zone	Refer to page 17 for test results	Tested and compliant with AS/NZS1530.3-1999 (R2016) Early Fire Hazard Index	Heavy Duty Class 1 Vapour Barrier Medium Duty and Light Duty Class 2 Vapour Barrier
Permatuff Building Blanket	Permatuff Extra Heavy Duty Building Blanket glasswool insulation is faced with Sisalation Multipurpose polyweave EHD (456) to achieve a vapour barrier with anti-glare coating. It is puncture-resistant and provides excellent thermal and acoustic control for metal clad roof and wall applications. Suitable behind internal walls or roof linings only (not for internally exposed applications)	Refer to page 8 to 15 for NCC 2019 requirements in your climate zone	n/a	Tested and compliant with AS/NZS1530.3-1999 (R2016) Early Fire Hazard Index	Vapour Barrier Class 2

*Refer to Metal Roof Duty Selection table on page 16

Features

Thermal control · Acoustic control · Condensation control · Fire resistant

Applications

Metal roof insulation with facing · Wall insulation with facing · Under slab/soffit concrete roof insulation with facing

Metal roof insulation · Wall insulation · Ceiling insulation

Metal roof membrane · Wall membrane · Concrete roof membrane

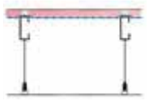
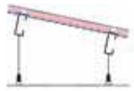
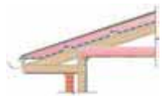
DESIGNING FOR THERMAL PERFORMANCE

Product Selector – National Construction Code 2019

Use the following tables to select the right Fletcher Insulation product for your project. The recommended insulation will provide a Deemed-to-Satisfy solution to meet the requirements of Section J of the National Construction Code 2019 for Class 2 to 9 buildings.

Step 1: Identify your climate zone in accordance with the NCC.
Step 2: Identify your roof structure and heatflow direction.
Step 3: Identify the minimum required material R-value for Deemed-to-Satisfy compliance.
Step 4: Select the appropriate Fletcher Insulation product based on the minimum required material R-value.
Step 5: Select the appropriate duty using the table on page 16.

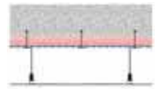
Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5

Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: DOWN 3.7
 **Flat Metal Roof with No Ceiling Unventilated[1].** $R_{T(roof + ceiling structure)}$ = R0.84 (Downwards) = R0.27 (Upwards)	**Minimum material R Value R_m**	**2.86**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Flat Metal Roof with Suspended Ceiling Unventilated[2].** $R_{T(roof + ceiling structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.36**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100m
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100m
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100m
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Suspended Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.36**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100m
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100m
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100m
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Flat Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling structure)}$ = R1.20 (Downwards) = R0.78 (Upwards)	**Minimum material R Value R_m**	**2.50**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100mm
	Permatuff Building Blanket	R2.5 100mm

Assumptions:

- No adjustment for loss of insulation due to exhaust fans, flues or recessed downlights etc.
- No thermal break in the system assuming silver foil faced Permastop® will be used on all metal roofs.
- For metal roof structures, only unventilated value was listed except the pitched roof with flat ceiling structure.
- AS/NZS4859.1 and NCC values may slightly differ, NCC value was listed wherever possible.

Fletcher Insulation has provided this information as a guide only. Product selections should be based on actual construction R-Value calculations, and discussions with your Fletcher Insulation Representative to ensure the product meets the required application.

Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: DOWN 3.7
 **Pitched Metal Roof with Flat Ceiling Ventilated (22.5° slope)** $R_{T(roof + ceiling structure)}$ = R1.29 (Downwards) = R0.63 (Upwards)	**Minimum material R Value R_m**	**2.41**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100m
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100m
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100m
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Raked Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling structure)}$ = R0.99 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.71**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Skillion Metal Roof Unventilated[3].** $R_{T(roof + ceiling structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**2.38**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100m
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100m
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100m
	Permatuff Building Blanket	R2.5 100m
 **Concrete Roof with Suspended Ceiling Unventilated[4].** $R_{T(roof + ceiling structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**2.26**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m

1. Assumes outdoor wind speed of 3m/s, indoor air film with low emittance surface.
2. Flat Metal Roof: Thermal resistance of attic spaces low emittance surface with air space ≥300mm (reflective surface).
3. Skillion Metal Roof: Low emittance surface unventilated air space with air space ≥300mm (reflective surface).
4. Concrete Roof: Thermal resistance of attic spaces low emittance surface from AS/NZS4859.1 2018 table K2, 13mm plasterboard with 150mm concrete and air space ≥300mm.
5. Calculation assumes Sisalation® Light Duty 436 Facing Foil is used in conjunction with Pink® Building Blanket.

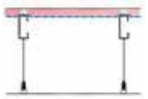
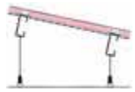
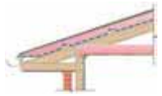
DESIGNING FOR THERMAL PERFORMANCE

Product Selector – National Construction Code 2019

Use the following tables to select the right Fletcher Insulation product for your project. The recommended insulation will provide a Deemed-to-Satisfy solution to meet the requirements of Section J of the National Construction Code 2019 for Class 2 to 9 buildings.

Step 1: Identify your climate zone in accordance with the NCC.
Step 2: Identify your roof structure and heatflow direction.
Step 3: Identify the minimum required material R-value for Deemed-to-Satisfy compliance.
Step 4: Select the appropriate Fletcher Insulation product based on the minimum required material R-value.
Step 5: Select the appropriate duty using the table on page 16.

Zone 6

Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: DOWN 3.2
 **Flat Metal Roof with No Ceiling Unventilated[1].** $R_{T(roof + ceiling\ structure)}$ = R0.84 (Downwards) = R0.27 (Upwards)	**Minimum material R Value R_m**	**2.36**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100m
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100m
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100m
	Permatuff Building Blanket	R2.5 100m
 **Flat Metal Roof with Suspended Ceiling Unventilated[2].** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**1.86**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Suspended Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**1.86**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Flat Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.20 (Downwards) = R0.78 (Upwards)	**Minimum material R Value R_m**	**2.00**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m

Assumptions:

- No adjustment for loss of insulation due to exhaust fans, flues or recessed downlights etc.
- No thermal break in the system assuming silver foil faced Permastop® will be used on all metal roofs.
- For metal roof structures, only unventilated value was listed except the pitched roof with flat ceiling structure.
- AS/NZS4859.1 and NCC values may slightly differ, NCC value was listed wherever possible.

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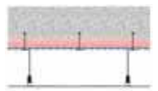
Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: DOWN 3.2
 **Pitched Metal Roof with Flat Ceiling Ventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.29 (Downwards) = R0.63 (Upwards)	**Minimum material R Value R_m**	**1.91**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m
 **Pitched Metal Roof with Raked Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R0.99 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.21**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m
 **Skillion Metal Roof Unventilated[3].** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**1.88**
	Pink® Building Blanket[5]	R2.3 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.3 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.3 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.3 100mm
	Permatuff Building Blanket	R2.5 100m
 **Concrete Roof with Suspended Ceiling Unventilated[4].** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**1.76**
	Pink® Building Blanket[5]	R1.8 75mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R1.8 75mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R1.8 75mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R1.8 75mm
	Permatuff Building Blanket	R1.8 75mm

1. Assumes outdoor wind speed of 3m/s, indoor air film with low emittance surface.
2. Flat Metal Roof: Thermal resistance of attic spaces low emittance surface with air space ≥300mm (reflective surface).
3. Skillion Metal Roof: Low emittance surface unventilated air space with air space ≥300mm (reflective surface).
4. Concrete Roof: Thermal resistance of attic spaces low emittance surface from AS/NZS4859.1 2018 table K2, 13mm plasterboard with 150mm concrete and air space ≥300mm.
5. Calculation assumes Sisalation® Light Duty 436 Facing Foil is used in conjunction with Pink® Building Blanket.

DESIGNING FOR THERMAL PERFORMANCE

Product Selector – National Construction Code 2019

Use the following tables to select the right Fletcher Insulation product for your project. The recommended insulation will provide a Deemed-to-Satisfy solution to meet the requirements of Section J of the National Construction Code 2019 for Class 2 to 9 buildings.

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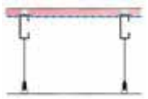
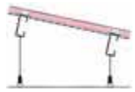
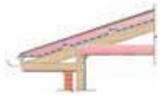
Step 2: Identify your roof structure and heatflow direction.
Step 3: Identify the minimum required material R-value for Deemed-to-Satisfy compliance.
Step 4: Select the appropriate Fletcher Insulation product based on the minimum required material R-value.
Step 5: Select the appropriate duty using the table on page 16.

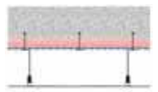
Zone 7

Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: UP 3.7
 **Flat Metal Roof with No Ceiling Unventilated[1.]** $R_{T(roof + ceiling\ structure)}$ = R0.84 (Downwards) = R0.27 (Upwards)	**Minimum material R Value R_m**	**3.43**
	Pink® Building Blanket[5]	R3.6 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.6 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.6 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.6 130mm
	Permatuff Building Blanket	R3.6 130mm
 **Flat Metal Roof with Suspended Ceiling Unventilated[2.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.98**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Pitched Metal Roof with Suspended Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.98**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Pitched Metal Roof with Flat Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.20 (Downwards) = R0.78 (Upwards)	**Minimum material R Value R_m**	**2.92**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm

Assumptions:

- No adjustment for loss of insulation due to exhaust fans, flues or recessed downlights etc.
- No thermal break in the system assuming silver foil faced Permastop® will be used on all metal roofs.
- For metal roof structures, only unventilated value was listed except the pitched roof with flat ceiling structure.
- AS/NZS4859.1 and NCC values may slightly differ, NCC value was listed wherever possible.

Fletcher Insulation has provided this information as a guide only. Product selections should be based on actual construction R-Value calculations, and discussions with your Fletcher Insulation Representative to ensure the product meets the required application.

Roof Structure	Deemed-To-Satisfy Total R-value R_T	Roof colour Solar absorptance ≤ 0.45 Direction of heatflow: UP 3.7
 **Pitched Metal Roof with Flat Ceiling Ventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.29 (Downwards) = R0.63 (Upwards)	**Minimum material R Value R_m**	**2.41**
	Pink® Building Blanket[5]	R2.5 100mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R2.5 100mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R2.5 100mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R2.5 100mm
	Permatuff Building Blanket	R2.5 100mm
 **Pitched Metal Roof with Raked Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R0.99 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**2.98**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Skillion Metal Roof Unventilated[3.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**3.00**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm
 **Concrete Roof with Suspended Ceiling Unventilated[4.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**2.88**
	Pink® Building Blanket[5]	R3.0 130mm
	Permastop® Building Blanket	
	Sisalation® Light Duty (LD) 436 Facing Foil	R3.0 130mm
	Sisalation® Medium Duty (MD) 430 Facing Foil	R3.0 130mm
	Sisalation® Heavy Duty (HD) 450 Facing Foil	R3.0 130mm
	Permatuff Building Blanket	R3.0 130mm

1. Assumes outdoor wind speed of 3m/s, indoor air film with low emittance surface.
2. Flat Metal Roof: Thermal resistance of attic spaces low emittance surface with air space ≥300mm (reflective surface).
3. Skillion Metal Roof: Low emittance surface unventilated air space with air space ≥300mm (reflective surface).
4. Concrete Roof: Thermal resistance of attic spaces low emittance surface from AS/NZS4859.1 2018 table K2, 13mm plasterboard with 150mm concrete and air space ≥300mm.
5. Calculation assumes Sisalation® Light Duty 436 Facing Foil is used in conjunction with Pink® Building Blanket.

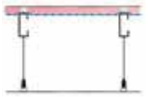
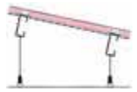
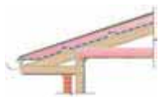
DESIGNING FOR THERMAL PERFORMANCE

Product Selector – National Construction Code 2019

Use the following tables to select the right Fletcher Insulation product for your project. The recommended insulation will provide a Deemed-to-Satisfy solution to meet the requirements of Section J of the National Construction Code 2019 for Class 2 to 9 buildings.

Step 1: Identify your climate zone in accordance with the NCC.
Step 2: Identify your roof structure and heatflow direction.
Step 3: Identify the minimum required material R-value for Deemed-to-Satisfy compliance.
Step 4: Select the appropriate Fletcher Insulation product based on the minimum required material R-value.
Step 5: Select the appropriate duty using the table on page 16.

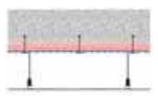
Zone 8

Roof Structure	Deemed-To-Satisfy Total R-value R_T	All Roof Colours Direction of heatflow: UP 4.8
 **Flat Metal Roof with No Ceiling Unventilated[1.]** $R_{T(roof + ceiling\ structure)}$ = R0.84 (Downwards) = R0.27 (Upwards)	**Minimum material R Value R_m**	**4.53**
	Pink® Building Blanket[5]	R2.3 100mm + R2.3 100mm
	Permastop® Building Blanket	R2.3mm 100mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R2.5 100mm Permatuff + R2.3 100mm Pink® Building Blanket
 **Flat Metal Roof with Suspended Ceiling Unventilated[2.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**4.08**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket
 **Pitched Metal Roof with Suspended Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**4.08**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket
 **Pitched Metal Roof with Flat Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.20 (Downwards) = R0.78 (Upwards)	**Minimum material R Value R_m**	**4.02**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket

Assumptions:

- No adjustment for loss of insulation due to exhaust fans, flues or recessed downlights etc.
- No thermal break in the system assuming silver foil faced Permastop® will be used on all metal roofs.
- For metal roof structures, only unventilated value was listed except the pitched roof with flat ceiling structure.
- AS/NZS4859.1 and NCC values may slightly differ, NCC value was listed wherever possible.

Fletcher Insulation has provided this information as a guide only. Product selections should be based on actual construction R-Value calculations, and discussions with your Fletcher Insulation Representative to ensure the product meets the required application.

Roof Structure	Deemed-To-Satisfy Total R-value R_T	All Roof Colours Direction of heatflow: UP 4.8
 **Pitched Metal Roof with Flat Ceiling Ventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R1.29 (Downwards) = R0.63 (Upwards)	**Minimum material R Value R_m**	**4.17**
	Pink® Building Blanket[5]	R1.8 75mm + R2.5 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.5 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.5 100mm Pink® Building Blanket
 **Pitched Metal Roof with Raked Ceiling Unventilated (22.5° slope)** $R_{T(roof + ceiling\ structure)}$ = R0.99 (Downwards) = R0.72 (Upwards)	**Minimum material R Value R_m**	**4.08**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket
 **Skillion Metal Roof Unventilated[3.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**4.1**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket
 **Concrete Roof with Suspended Ceiling Unventilated[4.]** $R_{T(roof + ceiling\ structure)}$ = R1.34 (Downwards) = R0.70 (Upwards)	**Minimum material R Value R_m**	**3.98**
	Pink® Building Blanket[5]	R1.8 75mm + R2.3 100mm
	Permastop® Building Blanket	R1.8 75mm Permastop® + R2.3 100mm Pink® Building Blanket
	Sisalation® Light Duty (LD) 436 Facing Foil	
	Sisalation® Medium Duty (MD) 430 Facing Foil	
	Sisalation® Heavy Duty (HD) 450 Facing Foil	
	Permatuff Building Blanket	R1.8 75mm Permatuff + R2.3 100mm Pink® Building Blanket

1. Assumes outdoor wind speed of 3m/s, indoor air film with low emittance surface.
2. Flat Metal Roof: Thermal resistance of attic spaces low emittance surface with air space ≥300mm (reflective surface).
3. Skillion Metal Roof: Low emittance surface unventilated air space with air space ≥300mm (reflective surface).
4. Concrete Roof: Thermal resistance of attic spaces low emittance surface from AS/NZS4859.1 2018 table K2, 13mm plasterboard with 150mm concrete and air space ≥300mm.
5. Calculation assumes Sisalation® Light Duty 436 Facing Foil is used in conjunction with Pink® Building Blanket.

DESIGNING FOR THERMAL PERFORMANCE
Material R-Value by insulation type

Fletcher Insulation have a range of high thermal performance insulation products which meet or exceed the minimum R-value recommended by the National Construction Code (NCC). Once an insulation type is selected (page 8 to 15), higher thermal performance (R-value) can be achieved by increasing the insulation thickness or combining multiple sheet thicknesses.

	Insulation Thickness (mm)				
	55	60	75	100	130
Pink® Building Blanket	R1.3		1.8	R2.3 R2.5	R3.0 R3.2 R3.6
Permastop® Building Blanket					
Sisalation® 436 Facing Foil Light Duty (LD)	R1.3	R1.4	R1.8	R2.3 R2.5	R3.0 R3.2 R3.6
Sisalation® 430 Facing Foil Medium Duty (MD)	R1.3	R1.4	R1.8	R2.3 R2.5	R3.0 R3.2 R3.6
Sisalation® 450 Facing Foil Heavy Duty (HD)	R1.3	R1.4	R1.8	R2.3 R2.5	R3.0 R3.2 R3.6
Permatuff® Building Blanket (EHD)	R1.3		R1.8	R2.5	R3.0 R3.2 R3.6

METAL ROOF DUTY SELECTION
(4200.2 Allowable Usage in Australia)

Climate	Span (mm)	Duty		Product
		Supported	Unsupported	
Standard	≤ 900	Light Duty	Light Duty	Permastop® Building Blanket LD
	> 900 to ≤ 1200	Light Duty		
			Medium Duty	Permastop® Building Blanket MD
	> 1200	Medium Duty		
		Heavy Duty	*	Permastop® Building Blanket HD
		Extra Heavy Duty	*	Permatuff Building Blanket EHD
Tropical/Hot/High Humidity	≤ 900	Light Duty	Light Duty	Permastop® Tropic Building Blanket LD
	> 900 to ≤ 1200	Light Duty		
			Medium Duty	Permastop® Building Blanket MD
	> 1200	Medium Duty		
			*	

*Outside the scope of AS4200.2

Note: Higher duty classified products and/or reduced fastener spacings should be considered where membranes are likely to be exposed to adverse weather conditions during construction, prior to cladding or in applications requiring higher differential air pressures.

DESIGNING FOR ACOUSTIC CONTROL
Noise reduction coefficients

Minimising noise is an important consideration when designing buildings. For projects requiring high levels of acoustic control such as concert halls, studios and auditoriums, Fletcher Insulation has a range of specialty facings to provide higher levels of acoustic control.

The performance of sound absorption for insulation is described by the Noise Reduction Coefficient (NRC). In sound absorption applications, the NRC is used as an acoustic performance measure. The higher the NRC, the greater the sound absorption at the representative frequencies.

Sound Absorption

Permastop® Building Blanket with Light Duty (LD) foil facing achieves the following sound absorption coefficients when determined in accordance with AS ISO 11654-1997. Permastop® Building Blanket with Heavy Duty Perforated was determined according to AS ISO 11654-2007.

The Noise Reduction Coefficient (NRC) is calculated according to ASTM C423-90A and the average result of four frequencies: 250Hz, 500Hz, 1000Hz and 2000Hz.

	Nominal Thickness	Practical Sound Absorption Coefficients α_p at Frequencies (Hz) of:						NRC
	mm	125	250	500	1000	2000	4000	
Permastop® Building Blanket (HDP) R1.8	75mm	0.35	0.80	1.00	1.00	0.95	0.95	0.95
Permastop® Building Blanket (HDP) R2.5	100mm	0.49	0.85	1.00	1.00	0.99	0.92	1.00
Permastop® Building Blanket (LD) R1.3	55mm	0.25	0.80	1.00	0.55	0.25	0.15	0.7
Permastop® Building Blanket (LD) R1.8	75mm	0.35	1.00	0.95	0.45	0.25	0.10	0.7
Permastop® Building Blanket (LD) R3.0	130mm	0.50	1.00	0.85	0.45	0.30	0.15	0.75
Permastop® Building Blanket (LD) R3.2	130mm	0.60	1.00	0.75	0.45	0.25	0.10	0.65
Permastop® Building Blanket (LD) R3.6	130mm	0.70	1.00	0.95	0.65	0.35	0.15	0.8

DESIGNING FOR FIRE MANAGEMENT

Fletcher Insulation Permastop® bulk insulation blanket products are deemed non-combustible in accordance with AS1530.1-1994, allowing you to take comfort in designing roof spaces that are more safe and secure by removing any additional fuel load in roof spaces.

Additionally, Permastop® offers further safeguard from embers in accordance with the BAL guidelines when building in bush fire prone areas.

In applications where the insulation becomes the ceiling lining and is exposed, Fletcher Insulation offer a range of insulation solutions that are in accordance with BCA to AS ISO 9705-2003 Full room scale test to Group 1, flammability test of materials AS1530.2-1993 (R2016) for facing foils and compliance with AS/NZS 1530.3-1999 (R2016) for combined bulk Glasswool insulation with a building membrane product ranges.

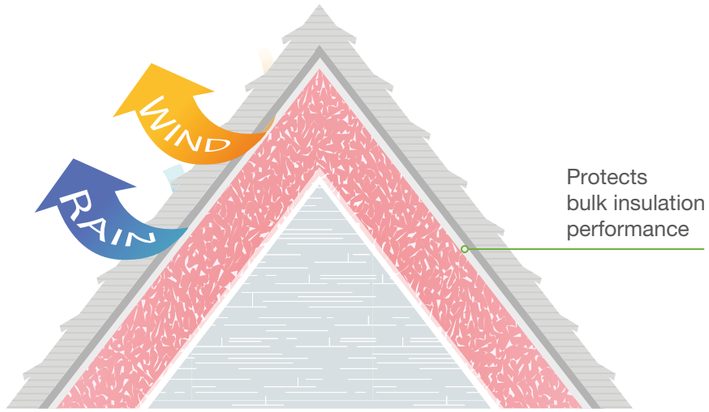
Please seek a review from a fire engineer for any recommendations prior to installation to ensure suitability to your individual project.

DESIGNING FOR CONDENSATION MANAGEMENT

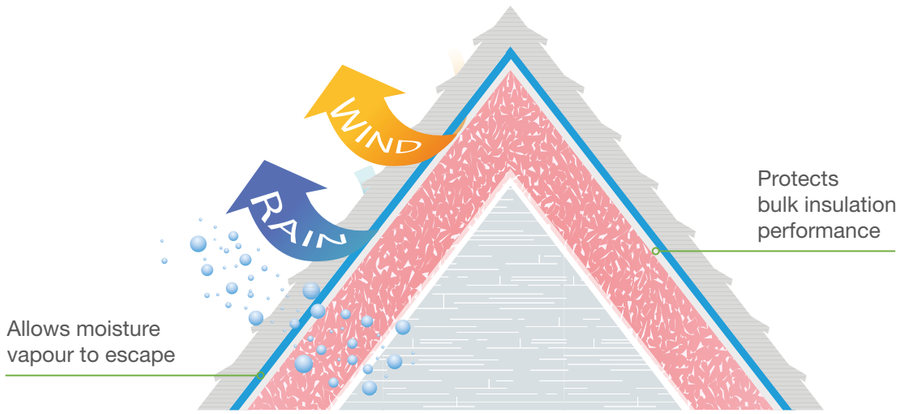
Fletcher Insulation Sisalation® Building Membranes comply with the requirements of AS/NZS4200.1 and are designed to protect the insulation by acting as a

- Waterproof barrier to repel rain, and a
- Vapour barrier to prevent wind washing and airborne contaminants such as dust.

Roof Sarking
Water and Vapour Barrier



Vapour Permeable Membrane



In certain climates and applications, condensation from inside the building may cause a build up of mould and mildew. For these applications, Vapour Permeable Building Membranes act as a water barrier with the additional benefit of allowing moisture vapour to escape from the building.

A GUIDE TO CHOOSING A ROOFING BUILDING MEMBRANE

Building Membranes are categorised either according to their reflective properties or their vapour permeability. The reflective properties ascertain the thermal benefits of the product and vapour permeability establishes the capability of the sarking to manage the movement of water vapour which provides control with 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 building 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 Building membrane is essential to safeguard the energy efficiency of any building and long-term wellbeing of its occupants. The following table can be used as a guide in selecting the right building membrane, for further information the Fletcher Insulation technical team can be contacted for specific detail pertaining to your project.

Typical Application	Product	Product Description	Benefits	Recommended Zone
Warehouse, sheds, retail bulky goods	**Sisalation® Metal Roof 433 MD**	Medium Duty, anti-glare pliable double-sided building membrane and sarking, with effective water and vapour barrier for installation above battens in metal roof applications.	Suitable where an air-gap-R-Value contribution is needed from the outward facing surfaces.	1 – 8
	Sisalation® Metal Roof 453 HD	Heavy Duty, anti-glare pliable double-sided building membrane and sarking, with effective water and vapour barrier for installation above battens in metal roof applications.	Premium quality foil for projects requiring a superior aesthetic finish. Highly recommended for use with supported and unsupported roof spans*	1 – 8
Stadiums, sporting facilities, retail bulky goods	**Sisalation® Metal Roof 433WF MD White face**	Medium duty, white face, antiglare sarking best laid separately with Pink® Building Blanket.	Provides an aesthetic white finish for exposed applications that require a non-sheen silver finish.	1 – 8
Warehouse, sheds	**Sisalation® Foam Cell Multipurpose**	An 8mm, Extra Heavy Duty (EHD), 3-in-1 solution combining insulation, thermal break, with and effective water and vapour barrier.	Ideal for metal clad roof applications or for use as a thermal break for steel framed constructions. Achieves a Group 2 rating. Reflects up to 95% radiant heat.	1 – 8
Office, multi-residential	**Sisalation® Vapawrap™ Vapour Permeable Metal Roof**	For use in Australia's colder regions where increasing moisture forms inside buildings. Made from synthetic roof sarking specifically designed for use under a range of roof cladding materials, allowing moisture in the air to pass through the membrane prior to condensing to water (condensation) on the building's exterior frame where it is less likely to spoil the building's interior.	Reduces the risk of condensation inside the building frame in cold climates** Improves energy efficiency by reducing draughts and protects the building frame from deterioration by reducing wind, rain and dust into the building.	2 – 8 In tropical regions (Zone 1) Vapawrap™ can replace the internal lining of Permastop® tropic blanket
Warehouse, office buildings, retail, concrete roof/ under slab	**Sisalation® Facing Foils:** **Light Duty (LD)** **Medium Duty (MD)** **Heavy Duty (HD)**	Facing Foils are always used in conjunction with Pink® Building Blanket to form Permastop® Building Blanket	**Heavy Duty:** Class 1 Vapour Barrier **Light Duty:** Class 2 Vapour Barrier **Medium Duty:** Class 2 Vapour Barrier All facing foils are strong, tear resistant facings with effective water and vapour barrier management. Designed for commercial applications and suitable for large spans***	1 – 8

* Must be signed-off by an engineer.
** If the membrane is to provide a continuous air tight layer, all joins and penetrations need to be sealed.
*** Refer to Metal Roof Duty Selection table on page 16

Applications Metal roof membrane Wall membrane

TECHNICAL INFORMATION: BUILDING BLANKETS

Product	Permastop® Building Blanket		
Facing	**Sisalation® 436 Facing Foil Light Duty Standard (LD)**	**Sisalation® 430 Facing Foil Medium Duty Standard (MD)**	**Sisalation® 450 Facing Foil Heavy Duty Standard (HD)**
			
Applications			
MATERIAL PROPERTIES			
Foil overlap length (mm)	150	150	150
Alkalinity of glasswool (pH)	9	9	9
Green Star compliant			
No Ozone Depleting Potential (ODP) substances in the manufacture or composition	Complies	Complies	Complies
No harmful levels of Volatile Organic Compounds (VOCs)	Complies	Complies	Complies
THERMAL PROPERTIES			
Max. Operating Temp. (°C)	70°C	70°C	70°C
Thermal performance (AS/NZS 4859.1-2018)	Complies	Complies	Complies

	Thickness (mm)	Permastop® Building Blanket		
		Sisalation® 436 Facing Foil Light Duty (LD)	**Sisalation® 430 Facing Foil Medium Duty (MD)**	**Sisalation® 450 Facing Foil Heavy Duty (HD)**
Material R-Value (m^2K/W)	55	R1.3	R1.3	R1.3
	60	R1.4	R1.4	R1.4
	75	R1.8	R1.8	R1.8
	100	R2.3 R2.5	R2.3 R2.5	R2.3 R2.5
	130	R3.0 R3.2 R3.6	R3.0 R3.2 R3.6	R3.0 R3.2 R3.6

ACOUSTIC PERFORMANCE – Refer to page 17			
CONDENSATION CONTROL			
Building membrane type	Water and Class 2 Vapour Barrier	Water and Class 2 Vapour Barrier	Water and Class 1 Vapour Barrier
FIRE HAZARD PROPERTIES			
Combustibility (AS1530.1-1994) of **glasswool** component	Non-combustible	Non-combustible	Non-combustible
NCC 2019 C1.9 Non-combustible building elements (e) (vi) for **foil facing** component	Complies to NCC ≤ 5	Complies to NCC ≤ 5	Complies to NCC ≤ 5
Ignitability, Flame Propagation, Heat Release and Smoke Release (AS/NZS 1530.3-1999)			
Ignitabiity Index	0		
Spread of Flame Index	0		
Heat Evolved Index	0		
Smoke Developed Index	0–1		
Full Scale Room Test AS ISO 9705-2003 (R2016)	Group 1	Group 2	Group 2
Bushfire Attack Level (BAL) in accordance with AS3959-2018			
0–40 in roof applications	Complies	Complies	Complies
0–FZ in wall applications	Complies	Complies	Complies

Product	Permatuff Building Blanket	Pink® Building Blanket
Facing	**Sisalation® Multipurpose Polyweave (EHD)**	
		
Applications		
MATERIAL PROPERTIES		
Foil overlap length (mm)	150	Not applicable
Alkalinity of glasswool (pH)	9	9
Green Star compliant		
No Ozone Depleting Potential (ODP) substances in the manufacture or composition	Complies	Complies
No harmful levels of Volatile Organic Compounds (VOCs)	Complies	Complies
THERMAL PROPERTIES		
Max. Operating Temp. (°C)	70°C	340°C (unfaced)
Thermal performance (AS/NZS 4859.1-2018)	Complies	Complies

	Thickness (mm)	Permatuff Building Blanket	Pink® Building Blanket
Material R-Value (m^2K/W)	55	R1.3	R1.3
	60	–	–
	75	R1.8	R1.8
	100	R2.5	R2.3 R2.5
	130	R3.0 R3.2 R3.6	R3.0 R3.2 R3.6

ACOUSTIC PERFORMANCE – Refer to page 17		
CONDENSATION CONTROL		
Building membrane type	Water and Class 2 Vapour Barrier	n/a
FIRE HAZARD PROPERTIES		
Combustibility (AS1530.1-1994) of **glasswool** component	Non-combustible	Non-combustible
NCC 2019 C1.9 Non-combustible building elements (e) (vi) for **foil facing** component	Complies to NCC ≤ 5	Not applicable
Ignitability, Flame Propagation, Heat Release and Smoke Release (AS/NZS 1530.3-1999)		
Ignitabiity Index	0	Not applicable
Spread of Flame Index	0	
Heat Evolved Index	0	
Smoke Developed Index	5	
Full Scale Room Test ISO AS ISO 9705-2003 (R2016)	Not Applicable	Not Applicable
Bushfire Attack Level (BAL) in accordance with AS3959-2018		
0–40 in roof applications	Complies	Complies
0–FZ in wall applications	Complies	Complies

TECHNICAL INFORMATION: BUILDING MEMBRANES

Product	Sisalation® Foam Cell	Sisalation® Vapawrap™ Vapour Permeable Membranes	Sisalation® Metal Roof Sarkings		Sisalation® Facing Foils		
	Sisalation® Foam Cell Multipurpose	Sisalation® Vapawrap™ Vapour Permeable Metal Roof	Metal Roof MD (433)	Metal Roof HD (453)	Sisalation® 436 Facing Foil Light Duty Standard (LD)	Sisalation® 450 Facing Foil Heavy Duty Standard (HD)	Sisalation® 450P Facing Foil Heavy Duty Perforated (HDP)
							
Applications							
MATERIAL PROPERTIES			**MATERIAL PROPERTIES**				
Membrane Type	Building Membrane	Building Membrane	Building Membrane	Building Membrane	Building Membrane	Building Membrane	Building Membrane
Emittance (reflective face) ASTM E408	0.03	0.9	0.03	0.03	0.03	0.03	0.03
Emittance (anti-glare face) ASTM E408	0.06	0.9	0.9	0.9	n/a	n/a	n/a
Duty rating AS/NZS 4200.1 Table 1	Extra heavy	Light	Medium	Heavy	Light	Heavy	Heavy Duty Perforated
Water barrier AS/NZS 4201.4	Water Barrier	Water Barrier	Water Barrier	Water Barrier	Water Barrier	Water Barrier	Non-Water Barrier
Vapour barrier (WVTR) ASTM E96	Vapour Barrier Class 2	Class 4 Vapour Permeable	Vapour Barrier Class 2	Vapour Barrier Class 2	Vapour Barrier Class 2	Vapour Barrier Class 1	No
Shrinkage AS/NZS 4201.3	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Resistance to dry delamination AS/NZS 4201.1	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Resistance to wet delamination AS/NZS 4201.2	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Tensile strength – machine direction (kN/m) AS1301.448S	≥ 13	≥ 7.5	≥ 9.5	≥ 12.5	≥ 7.5	≥ 12.5	≥ 12.5
Tensile strength – Lateral direction (kN/m) AS1301.448S	≥ 10.5	≥ 4.5	≥ 6.0	≥ 7.5	≥ 4.5	≥ 7.5	≥ 7.5
Edge tear resistance – machine direction (N) AS4200.1	≥ 90	≥ 90	≥ 65	≥ 80	≥ 45	≥ 80	≥ 80
Edge tear resistance – lateral direction (N) AS4200.1	≥ 90	≥ 90	≥ 65	≥ 80	≥ 45	≥ 80	≥ 80
Anti-glare coating	Yes	Yes	Yes	Yes	No	No	No
Foil overlap length (mm)	150	No overlap	150	150	150	150	150
Green Star compliant							
No Ozone Depleting Potential (ODP) substances in the manufacture or composition	Complies	Complies	Complies	Complies	Complies	Complies	Complies
No harmful levels of Volatile Organic Compounds (VOCs)	Complies	Complies	Complies	Complies	Complies	Complies	Complies
THERMAL PROPERTIES			**THERMAL PROPERTIES**				
Thermal performance (AS/NZS 4859.1-2018)	Complies	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Material R-Value (m^2K/W) ASTM C518	R0.2	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
FIRE HAZARD PROPERTIES			**FIRE HAZARD PROPERTIES**				
NCC 2019 C1.9 Non-combustible building elements (e) (vi) for **foil facing** component	Complies to NCC ≤ 5	Complies to NCC ≤ 5	Complies to NCC ≤ 5	Complies to NCC ≤ 5	Complies to NCC ≤ 5		Not Applicable
Full scale room test AS ISO 9705-2003 (R2016)	Group 2	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Bushfire Attack Level (BAL) in accordance with AS3959-2018							
0–40 in roof applications	Complies	Complies	Complies	Complies	Complies	Complies	Not Applicable

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