



Pliable building membranes and underlays

Part 2: Installation



This Australian Standard® was prepared by Committee BD-058, Thermal Insulation. It was approved on behalf of the Council of Standards Australia on 27 September 2016. This Standard was published on 2 May 2017.

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 - Australian Building Codes Board
 - Australian Cellulose Insulation Manufacturers Association
 - Australian Professional Thermography Association
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 - Plastics and Chemicals Industries Association
 - Pliable Membranes Association of Australia and New Zealand
 - Polyester Insulation Manufacturers Association
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Australian Standard[®]

Pliable building membranes and underlays

Part 2: Installation

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PREFACE

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee BD-058, Thermal Insulation, to supersede AS/NZS 4200.2:1994, *Pliable building membranes and underlays, Part 2: Installation requirements*.

This Standard incorporates Amendment No. 1 (June 2018) and No. 2 (June 2021). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this revision is to specify procedures for the installation of pliable building membranes in buildings that are consistent with good building practice. The requirements for installation have been compiled from a wide range of procedures used in Australia and considered as good practice in the installation of pliable building membranes.

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This Standard is intended to be read in conjunction with AS 4200.1, *Pliable building membranes and underlays, Part 1: Materials*.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

This Standard incorporates a Commentary on some Clauses. The Commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a panel. The Commentary is intended to help readers understand the background to the clause but does not form part of the clause.

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FOREWORD

This edition of AS 4200.2 includes requirements on how to install membranes for the purpose of sarking to provide effective weather proofing. Weather proofing is achieved through the control of air, liquid water and water vapour transfer in roofs and walls. These sarking materials also commonly utilize reflective metallic coatings on one or both sides of the membrane to deliver a level of thermal control. These sarking and thermal control pliable building membranes require certain installation practices to achieve the purpose for which the product is designed and installed.

In recent years, evidence shows that there is a danger of electrocution where electrically conductive membranes are used in certain applications within the building envelope. This edition of AS 4200.2 provides advice on these safety concerns. This Standard does not purport to address all of the safety concerns associated with the use of pliable building membranes. It is the responsibility of the user of this Standard to establish appropriate work, health and safety practices and determine the applicability of regulatory requirements prior to use.

STANDARDS AUSTRALIA
Australian Standard
Pliable building membranes and underlays

Part 2: Installation

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard sets out requirements for the installation of pliable building membranes (also known as ‘sarking’ or ‘underlay’), when used either independently or as a facing to other materials, such as insulation materials, for any one or more of the following control functions:

- (a) Water control.
- (b) Thermal control.
- (c) Vapour control.
- (d) Air control.

This Standard does not cover requirements for materials used in the following applications:

- (i) Air-handling ducts and building services.
- (ii) Under concrete slabs on-ground.
- (iii) Waterproofing above flat concrete roofs.

NOTES:

- 1 The installation of foil-faced building blanket is covered in AS 3999, except for metal sheet roofing and walls, which are covered in Section 3 of this Standard.
- 2 Where regulations require special attention in bushfire prone areas, it may be necessary for a pliable building membrane to comply with AS 3959.
- 3 This Standard includes advice on work health and safety (WHS), and electrical safety (see Appendix A); however, the user of this Standard needs to refer to relevant federal, state and territory regulations and determine legal requirements as applicable.

1.2 APPLICATION

A2 | This Standard is intended to be read in conjunction with AS 4200.1.

This Standard sets out minimum requirements for the installation of pliable building membranes. It does not purport to provide for all of the requirements for any particular installation.

Care shall be taken to ensure that the requirements are applied to the intended functions of the pliable building membranes.

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS	
2050	Installation of roof tiles
4055	Wind loads for housing

A2	4200	Pliable building membranes and underlays
	4200.1	Part 1: Materials
	AS/NZS	
	3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
	4859	Materials for the thermal insulation of buildings
	4859.1	Part 1: General criteria and technical provisions
A2	4859.2	Thermal insulation materials for buildings, Part 2: Design

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Air control membrane

A membrane installed to prevent air transfer between each side of the membrane.

A2 | NOTE: Air control membranes are classified as air barriers by AS 4200.1.

1.4.2 Ceiling

Construction covering the underside of a floor or roof and providing the overhead surface of an enclosed space, often in order to conceal structural members or mechanical or electrical systems.

1.4.3 Competent person

A person, who has acquired, through training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the required task correctly.

1.4.4 Pliable building membrane

A material that can be folded back on itself without causing structural damage to the product that affects its material properties.

1.4.5 Thermal control membrane

A membrane with a surface emissivity and/or material R-value intended to reduce heat transfer.

NOTE: Thermal control membranes are commonly referred to as 'reflective insulation' or 'reflective foil laminates'.

1.4.6 Vapour control membrane

A2 | A pliable building membrane designed to either allow or restrict the transfer of water vapour across the membrane, as classified in Table 1 of AS 4200.1.

NOTE: Previous editions of this Standard referred to vapour barrier low/medium/high. All membranes are now classified in accordance with their vapour permeance and all are considered vapour control membranes.

1.4.7 Water control membrane

A2 | A membrane classified as a water barrier according to AS 4200.1, intended to collect and discharge any water that may penetrate a building envelope or cladding, excluding damp-proofing and flashing materials.

NOTE: Water control membranes are commonly referred to as 'sarking'.

1.4.8 Unprotected circuit

An electrical circuit that has not been fitted with an approved safety switch.

NOTE: The following are examples of unprotected circuits:

- (a) Air-conditioning.
- (b) Consumer mains.
- (c) Hot water systems.
- (d) Solar systems.
- (e) Stoves.
- (f) Sub-mains in particular circumstances.

A2

1.5 [Text deleted]

SECTION 2 DESIGN SPECIFICATION REQUIREMENTS

2.1 GENERAL

This Section sets out requirements for the design of pliable building membranes, and includes the properties and functions of pliable building membranes that need to be considered in the design specification.

The pliable building membrane shall be installed to satisfy the design specification, intended purpose, performance properties and function of the membrane.

A2 | The design shall specify the purpose and required properties of the membrane, selected in accordance with AS 4200.1, and identify—

- (a) where the membrane shall be installed within the building system, including adjacent air gaps for thermal performance;
- (b) the material properties of the membrane with information to enable the selection of the membrane; and
- (c) fixing and sealing requirements for thermal performance, weatherproofing and water vapour management strategies.

NOTE: Guidance on durability is provided in Appendix B.

2.2 VAPOUR CONTROL MEMBRANES

Where a pliable building membrane is installed as a vapour barrier, Class 1 or Class 2, it shall be continuously sealed at all discontinuities, end laps, joints and penetrations, by one of the following:

- (a) Heat and moisture resistant adhesive tape.
- (b) Mechanical fixing with adhesive sealant.
- (c) Adhesive bond.

NOTE: Bulk insulation or additional ventilation may also assist in reducing the condensation risk when used in conjunction with vapour control membranes.

C2.2 *Vapour control membrane Class 1 is equivalent to a vapour barrier high, and Class 2 is equivalent to vapour barrier medium, as per AS/NZS 4200.1:1994.*

2.3 AIR CONTROL MEMBRANES (AIR BARRIERS)

A2 | Where a pliable building membrane is to be installed as an air barrier, it shall be classified as an air barrier, in accordance with AS 4200.1. Where installed as an air barrier, the membrane shall be taped or sealed at overlaps, end laps, discontinuities and penetrations. This shall be achieved using the sealing requirement specified in Clause 2.2.

2.4 WATER CONTROL MEMBRANES

Where a pliable building membrane is to be installed as a water control membrane (sarking) in a building, it shall be installed at a slope of no less than 2° to facilitate drainage.

A2 | A pliable building membrane installed in a roof as a sarking membrane shall be classified as a water barrier in accordance with AS 4200.1.

2.5 THERMAL CONTROL MEMBRANES

A2

Where a pliable building membrane is to be installed as a thermal control membrane and contributes a material and/or IR (infrared) reflective R-value, the calculation of the total R-value shall be in accordance with AS/NZS 4859.2.

NOTE: Where thermal control membranes are designed for a metal roof, the following should be considered:

- (a) Where thermal control membranes are installed over the battens, condensation may occur at the batten in some localities. This would be reduced if the sarking were installed under the batten. Where installed over the battens, additional condensation measures may be required. For guidance on protection against condensation, see Appendix C.
- (b) Where installed over the battens, elevated daytime temperatures of roofs may lead to product deterioration in some localities. Information on appropriate membrane working temperatures should be sought.
- (c) The total R-value of the thermal control membrane is dependent on the heat flow direction and air gap provided. Refer to the product label and specifications for correct product orientation.

2.6 ALLOWABLE USE BASED ON DUTY CLASSIFICATIONS

A2

The allowable use shall be determined in accordance with the duty classification specified in AS 4200.1, and the spans outlined in Table 2.6. Where the spans exceed those specified in Table 2.6, the membrane shall be supported from below.

NOTE: The support may be safety mesh or rigid sheeting.

TABLE 2.6
DUTY CLASSIFICATION AND ALLOWABLE USAGE
IN AUSTRALIA

Application	Supported	Unsupported
Walls and gables	Light wall	Light wall
Tiled roofing:		
≤600 mm spans (wind class ≤ N2)	Medium duty	Medium duty
≤600 mm spans (wind class > N2)	Medium duty	Heavy duty
>600 mm ≤900 mm spans	Medium duty	Extra heavy duty
>900 mm spans	Medium duty	*
Metal sheet roofing, ceilings and floors:		
≤900 mm spans	Light duty	Light duty
>900 to ≤1200 mm spans	Light duty	Medium duty
>1200 mm spans	Medium duty	*

* Outside the scope of this Standard.

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.

C2.6 Allowable use duty classifications are based on the wind conditions experienced by the membrane in its fully constructed configuration.

SECTION 3 INSTALLATION OF PLIABLE BUILDING MEMBRANES

3.1 SCOPE OF SECTION

This Section sets out requirements for the installation of pliable building membranes within the structure depending on the location and functions specified.

3.2 GENERAL REQUIREMENTS

When installing pliable building membranes, the following requirements apply:

- (a) Damage or tears to the membrane shall be repaired to restore the integrity and maintain the purpose of the membrane.
- (b) The membrane shall be cut to provide a neat fit around obstacles and penetrations (see Section 4).
- (c) Exposure of pliable building membranes to intense heat, sparks, flames or abrasive tools shall be avoided.
- (d) Where a pliable building membrane is installed as a vapour control membrane, Class 1 or Class 2, or as an air barrier, it shall be continuously sealed at all discontinuities, end laps, joints and penetrations by—
 - (i) a pressure sensitive, heat and moisture resistant tape;
 - (ii) adhesive of equal or greater vapour resistance than the vapour control membrane;
 - (iii) heat and moisture resistant adhesive tape;
 - (iv) mechanical fixing with adhesive sealant; or
 - (v) adhesive bond.

NOTES:

- 1 Installation of electrically conductive membranes increases the risk of electrocution, in particular for installations in roofs, ceilings, walls and floors where electrical wiring or equipment is present.
- 2 Working in ceiling spaces presents a potential safety hazard.
- 3 Guidance on installation safety considerations is provided in Appendix A.

3.3 COMMON REQUIREMENTS FOR ROOFS

3.3.1 General

This Clause (3.3) specifies requirements for the installation of pliable building membranes in roofs.

NOTE: Additional requirements are given in Clauses 3.4 and 3.5 for metal sheet roofs and tiled roofs respectively.

The following requirements apply to the installation of pliable building membranes in roofs:

- (a) The pliable building membrane shall be selected and installed to fulfil the function specified in the design.
- (b) All joints shall be—
 - (i) overlapped not less than 150 mm; or
 - (ii) overlapped not less than 50 mm and taped on the exterior face (see Note 1).

- (c) All end joints shall be positioned over supporting members.
- (d) The pliable building membrane shall be supported by either—
 - (i) draping over the roof battens, trusses or rafters, with a sag at a slope of not less than 2° to facilitate drainage; or
 - (ii) supporting on safety mesh or other continuous support where available.
- (e) Installation across the roof trusses or rafters shall be by unrolling parallel to the fascia, where positioned below the roof battens (see Note 2).
- (f) The pliable building membrane shall continue over the ridge with an overlap of not less than 150 mm. Where specifically designed ridge ventilation is installed, the membrane shall be terminated at the ventilation.
- (g) The pliable building membrane shall be cut around obstacles, and all openings shall be sealed (see Section 4). Special care shall be taken to avoid tearing or puncturing the pliable building membrane during its installation, such as by contact with back edges of gutters.
- (h) At valleys, the pliable building membrane shall be carried beyond the inside vertical face of the valley batten, turned down into the edge of the valley tray and held in place between the metal roof sheet and valley batten by fixing the valley batten parallel to the valley gutter (as shown in Figure 3.3.1). The membrane shall overlap the valley edge by not less than 25 mm.
- (i) At fascias and barges, the pliable building membrane shall extend beyond the front edge of the fascia or barge and protrude not more than 25 mm beyond the fascia or barge [as shown in Figure 3.5.1(C)] (see Note 3).
- (j) Where acting as a water control membrane, the pliable building membrane shall be installed at a slope of no less than 2 degrees to facilitate drainage (see Note 4).

NOTES:

- 1 The tape used should be membrane compatible and appropriate for the application environment.
- 2 Fasteners may be needed to maintain uniform overlaps between successive runs prior to fixing the roof battens.
- 3 Where gutter overflow measures require a controlled gap between gutter and fascia, care should be taken to ensure the membrane or insulation blanket does not impede normal gutter flow or overflow paths.
- 4 Where the product data sheets indicate pliable building membranes are susceptible to shrinkage under elevated temperatures, they should be installed under the battens to separate the membrane from the cladding.

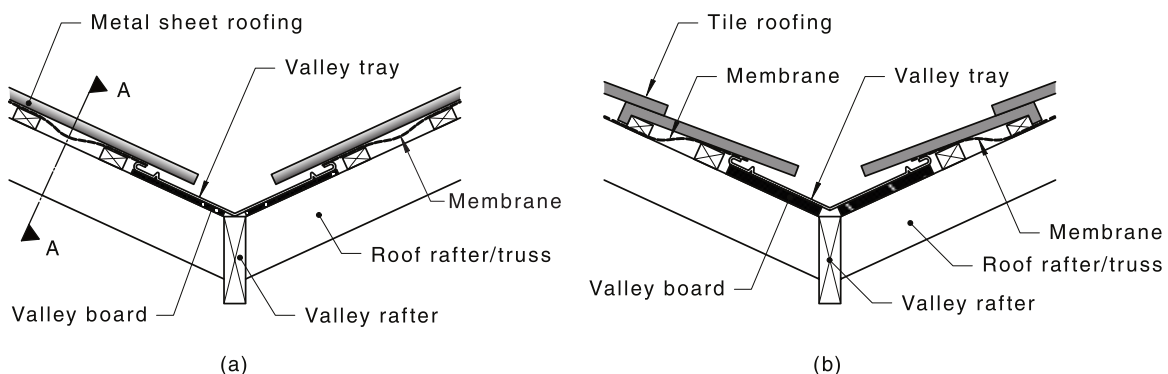


FIGURE 3.3.1 TREATMENT OF ROOFS AT VALLEYS WITH SARKING OVER AND UNDER BATTENS

3.3.2 Thermal control membranes

Where a pliable membrane is to function as a thermal control membrane, the membrane shall be installed in accordance with Clause 2.5.

3.3.3 Water control membranes (sarking)

Where a pliable building membrane is intended to function as a water control membrane, the upper sheets shall overlap the lower sheets by not less than 150 mm, or 50 mm taped on the exterior face to ensure water is shed to the outside face of the membrane. All penetrations shall be sealed as outlined in Section 4 and the membrane shall be installed to facilitate drainage to the building flashing.

NOTES:

- 1 For treatment of the fascia for high pitched roofs, see Figure 3.5.1(C).
- 2 For treatment of the fascia for low pitched roofs, see Figure 3.5.1(D).

3.3.4 Membrane support systems

Where the pliable building membrane is required by Clause 2.6 to be supported from below, the support system shall be for the intended use.

3.4 METAL SHEET ROOFING

3.4.1 General

The installation of a pliable building membrane beneath metal sheet roofing shall be as follows:

- A1
- (a) Where positioned above the roof purlins/battens, the following applies:
 - (i) The pliable building membrane shall be—
 - (A) installed by unrolling from ridge to eave [see Figure 3.4.1(a)]; or
 - (B) installed by unrolling parallel to the fascia, provided all side joints occur over a roof batten or purlin, [see Figure 3.4.1(b)] where the membrane is unsupported.
 - (ii) All joints shall be installed in accordance with Clause 3.3.1(b).
 - (b) Where intended to be positioned below the roof purlins/battens, the pliable building membrane shall be installed across the roof trusses or rafters by unrolling parallel to the fascia [see Figures 3.4.1(c)] (see Note 3).
 - (c) Where faced to a bulk insulation blanket, the pliable building membrane shall be terminated at the external edge of the fascia or, in the absence of a fascia, at the last batten.
 - (d) For rafter construction with horizontal lay, jointing of lengths of pliable building membranes shall be achieved by overlapping the ends of the pliable building membrane and fastening the pliable building membrane to the rafters.

NOTES:

- 1 Placing a reflective membrane under a metal roof and over rather than under the battens may increase the risk of condensation forming on the underside of the membrane. For guidance on protection against condensation, see Appendix C.
- 2 On low pitch metal roofs, draping of the membrane between purlins can result in ponding which should be avoided. In such cases it is preferable for the membrane to be fully supported to give a clear drainage path. If not practical on low pitch roofs then the overlap should be sealed to prevent water ingress to the ceiling space below.
- 3 Fasteners may be needed to maintain uniform overlaps between successive runs prior to fixing the roof battens.