

PLIABLE BUILDING MEMBRANES – VAPOUR / WATER CONTROL

1 SCOPE

- This specification applies to pliable building membranes, also known as sarking or underlay, used either independently or as a facing to other materials within a building structure as a means of water control.
- This document has been prepared in a manner compliant with the requirements of AS/NZS ISO/IEC 17065.
- APAS® is a trademark registered with IP Australia, owned by CSIRO, the Scheme Owner, and protected under applicable laws. Use of the trademark or the Certification Scheme is prohibited unless prior approval in writing is obtained from CSIRO via the APAS Secretariat.

2 BACKGROUND

- To obtain a broad overview of the Australian Paint Approval Scheme (APAS), refer to APAS document AP-D001.
- To obtain an overview of restricted ingredients in APAS certified products, refer to APAS document AP-D123.
- To obtain the current list of APAS participating manufacturers and resellers, refer to APAS document AP-D152.
- To obtain an overview of how to participate in the APAS, refer to APAS document AP-D177.

3 DEFINITIONS AND ACRONYMS

3.1 Definitions

The definition of terms used in this document and in the Certification Scheme can be found in APAS Document AP-D001. In addition, the following definitions shall apply:

- Lateral Direction:** For materials with reinforcement running at an angle not less than 45° from machine direction, the direction parallel to the most dominant of such reinforcement.
- Machine Direction:** The lengthwise direction of the pliable building membrane roll.
- Pliable Building Membrane:** A material that is able to be folded back on itself without causing structural damage to the material itself that affects its properties.
- Sarking:** A pliable membrane, such as boarding, felt or laminated aluminium foil, that is fixed over rafters of a roof before tiles, slate or other types of roofing material is added; can assist in insulation working more efficiently and protection from storm driven rain and dust.
- Shrinkage:** The percentage reduction, in linear dimension, that occurs under specific test conditions.
- Underlay:** A material that is laid underneath another material to aid in protection and/or support of the material laid on top.
- Vapour Control Membrane:** A pliable building membrane, also known as a Vapour Control Layer, designed to either retain or restrict the transfer of water vapour across the membrane.
- Water Control Membrane:** A layer of water-tight material used to aid in the prevention of water ingress

or damage by collection and discharge of any water that may penetrate a building envelope or cladding classified as a water barrier (membrane passes the test specified in AS/NZS 4201.4).

3.2 Acronyms

The following acronyms appear in this document:

AIW	Australian Institute of Waterproofing
APAS	Australian Paint Approval Scheme
AS	Australian Standard
AS/NZS	Australian Standard / New Zealand Standard
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HIA	Housing Industry Association
MBA	Master Builders Australia
MPDA	Master Painters & Decorators Australia
PDS	Product Data Sheet
SDS	Safety Data Sheet
TDS	Technical Data Sheet
WHS	Workplace Health and Safety

4 DESCRIPTION AND GUIDE FOR USERS

4.1 General Information

- This specification applies to pliable building membranes, also known as sarking or underlay, used either independently or as a facing to other materials i.e., insulation materials, within a building structure as a means of water control.
- The most commonly reported complaints in the building industry have root causes based on water ingress issues. These issues can stem from a number of sources, including, but not limited to:
 - Preparation and/or installation inadequate or not to specification i.e., surface was not clean, free from dust, was not appropriately dry / had moisture content.
 - Lack of experience, training, and education.
 - Variability in commonwealth, state and territory licensing and regulatory requirements for waterproofing contractors.
 - Selection and use of inferior or non-compatible materials and products.
 - Job Supervision, and
 - Inadequate or no maintenance.
- The manufacturer's Technical Data Sheet (TDS) or Product Data Sheet (PDS) should be consulted to confirm that the exposure conditions to which the pliable building membrane is to be exposed is within the capabilities of that membrane.
- Industry consultation with the AIW, HIA, MBA, MPDA and Industry experts was sought in the preparation of this specification.

NOTE: The application of pliable building membranes can be performed by waterproofing contractors, cladding contractors and/or building contractors or a combination of the above.

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4.2 Sub-Classes

- a) This specification does not incorporate any sub-classes.

4.3 Basis of this Specification

- a) This specification is based on AS/NZS 4200.1 and relevant areas of the National Construction Code.

5 REFERENCED DOCUMENTS

- a) The following standards are referenced in this document:
- AS 1530.2[^]**: Methods for fire test on building materials, components, and structures – Part 2: Test for flammability of materials
 - AS 2001.2.19[^]**: Methods of test for textiles – Determination of bursting force of textile fabrics – Ball Burst method
 - AS/NZS 1301.423[^]**: Methods of test for pulp and paper – Method 423: Folding strength of paper – Kohler-Molin method
 - AS/NZS 1301.448[^]**: Methods of test for pulp and paper – Method 448: Tensile strength of paper and paperboard (constant rate of elongation method, 20 mm/min; ISO 1924-2:2008, MOD)
 - AS 3706.4[^]**: Geotextiles – Methods of test – Method 4: Determination of burst strength – California bearing ratio (CBR) – Plunger method
 - AS/NZS 4200.1[^]**: Pliable building membranes and underlays – Part 1: Materials
 - AS/NZS 4201.1[^]**: Pliable building membranes and underlays – Methods of test – Method 1: Resistance to dry delamination
 - AS/NZS 4201.2[^]**: Pliable building membranes and underlays – Methods of test – Method 2: Resistance to wet delamination
 - AS/NZS 4201.3[^]**: Pliable building membranes and underlays – Methods of test – Method 3: Shrinkage
 - AS/NZS 4201.4[^]**: Pliable building membranes and underlays – Methods of test – Method 4: Resistance to water penetration
 - AS/NZS 4201.5[^]**: Pliable building membranes and underlays – Methods of test – Method 5: Emittance
 - AS/NZS 4201.6[^]**: Pliable building membranes and underlays – Methods of test – Method 6: Surface water absorbency
 - ASTM E96 / E96M-16[^]**: Standard Test Methods for Water Vapor Transmission of Materials
 - AS/NZS ISO/IEC 17065[^]**: Conformity assessment: Requirements for bodies certifying products, processes, and services

These documents may be purchased through the Reference Standards Australia website:
<https://www.standards.org.au/>

- xv. **TAPPI T 470[^]**: Technical Association of the Pulp and Paper Industry (TAPPI) – Edge Tearing Resistance of Paper (Edge-Tear Stirrup Method)

This document may be purchased through the TAPPI website: <https://www.tappi.org/>

- xvi. **The Therapeutic Goods (Poisons Standard - February 2023) Instrument 2023[^]**: Part 2: Controls on Substances, Division 9 - Paint or Tinters

This document is available from the Australian Government Federal Register of Legislation website at: [The Therapeutic Goods \(Poisons Standard—February 2023\) Instrument 2023 \(legislation.gov.au\)](https://www.legislation.gov.au/instrum2023)

- xvii. **National Construction Code (NCC) 2022[^]**: Volume 1, Volume 2, and Volume 3 (and any relevant amendments to these Volumes)

These documents can be downloaded from the Australian Building Codes Board website at: [National Construction Code 2022 | NCC \(abcb.gov.au\)](https://www.abcb.gov.au)

NOTE[^]: Australian and international standards, industry standards, the NCC and the Poisons Standard can be subject to changes and variations, therefore it is important to check the regulatory requirements in the state or territory in which a product is to be used.

- b) The following APAS documents are referenced in this document:
- AP-D001 Rules Governing How APAS[®] Operates
 - AP-D123 Restrictions on Ingredients in Product Formulations
 - AP-D152 APAS[®] Participating Manufacturers and Resellers
 - AP-D177 Rules Governing How Product Manufacturers participate in APAS[®]
 - AP-D181 Volatile Organic Compounds (VOC) Limits
 - AP-D192 Rules Governing APAS[®] Product Certification Scheme

All APAS documents are available for download from the APAS website: [APAS Documents & Forms](#)

6 PRODUCT APPROVAL REQUIREMENTS

6.1 General Requirements

- a) The pliable building membrane / underlay shall comply with this specification and the relevant requirements of APAS document AP-D192 during the life of the approval.

6.2 Technical Requirements

- a) The system shall comply with **all** the requirements of clause 7, Table 1 below.
- b) In line with the NCC, all laboratory testing requirements stated in clause 7, Table 1 must be undertaken by an AS ISO/IEC 17025 accredited laboratory with all applicable test methods included in their Scope of Accreditation. A grace period will exist in order for all testing facilities to achieve AS ISO/IEC 17025 accreditation. **This Grace period will end on 31st July 2025.**



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- c) AS ISO/IEC 17025 accreditation shall be provided by an organisation accredited by an ILAC Mutual Recognition Arrangement signatory and having a Scope of Accreditation covering AS ISO/IEC 17025 requirements. In Australia, NATA provides AS ISO/IEC 17025 accreditation. A list of international ILAC accreditation bodies can be found on the ISO website.
- d) At the time of publication of this document, the following testing authorities were recognised by APAS for ability to test products to the requirements of AP-S4001, and have either currently or are working towards all testing under their AS ISO/IEC 170205 (NATA) Scope of Accreditation:
- i. **CSIRO Materials Durability & Coatings Lab**
71 Normanby Road
Clayton VIC 3169
(sample deliveries to Gate 3)
Contact: Money Arora
T: +61 3 9545 8774
E: money.arora@csiro.au
 - ii. **XTec Gen Laboratory**
30-32 Park Avenue
Woodville North SA 5012
Contact: Eric Scardigno
T: 1300 152 298
E: eric.s@xtecgen.com

6.3 Health and Safety Requirements

- a) The manufacturer's Safety Data Sheet (SDS) and/or product data sheet (PDS) and/or technical data sheet (TDS) must be studied closely prior to using the product and must be complied with during use of the product.
- b) Products intended for sale in Australia shall comply with all the requirements of the Therapeutic Goods (Poisons Standard - February 2023). Products intended for sale in other countries shall comply with all local WHS and environmental requirements.
- c) The product shall comply with all requirements of clause 6.3 and 6.4 of APAS document AP-D192.



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7 TABLE 1: PERFORMANCE PROPERTIES

PROPERTY REQUIREMENT	TEST METHOD	RESULTS REQUIREMENTS
MATERIAL PROPERTIES		
Resistance to Dry Delamination	AS/NZS 4200.1 clause 5.2.1.1; AS/NZS 4201.1	State results.
Resistance to Wet Delamination	AS/NZS 4200.1 clause 5.2.1.2; AS/NZS 4201.2	State results.
Moisture Shrinkage	AS/NZS 4200.1 clause 5.2.2; AS/NZS 4201.3	Both wet and dry shrinkage results are to be recorded and shall not be > 0.5% in both machine and lateral directions.
Folding Endurance	AS/NZS 4200.1 clause 5.2.3; AS/NZS 1301.423	Machine Direction: ≥ 2.00 Cross Direction: ≥ 1.70
MATERIAL CLASSIFICATIONS		
Tensile Strength	AS/NZS 4200.1 clause 5.3.2.2; AS/NZS 1301.448	State results noting the orientation of specimens with regard to machine and lateral directions.
Edge Tear Resistance	AS/NZS 4200.1 clause 5.3.2.3; TAPPI T 470	State results noting the orientation of specimens with regard to machine and lateral directions.
Burst Strength	AS/NZS 4200.1 clause 5.3.2.4; AS 2001.2.19 or AS 3706.4	NOTE: This test is only required if the Duty Classification of the material under test is Light Wall and the tensile strength is not being tested. State results.
Overall Duty Classification	AS/NZS 4200.1 clause 5.3.2.1, Table 1	Based on the results obtained from Tensile Strength, Edge Tear Resistance and Burst Strength (where applicable), state the material Duty Classification.
Emittance Classification	AS/NZS 4200.1 clause 5.3.3 and Table 2; AS/NZS 4201.5	State classification and results. If applicable, state the Membrane Emittance Category.
Vapour Control Classification	AS/NZS 4200.1 clause 5.3.4 and Table 4; ASTM E96 / E96M-16	State classification and results.
Water Control Classification	AS/NZS 4200.1 clause 5.3.5; AS/NZS 4201.4	State classification.
Flammability Classification	AS/NZS 4200.1 clause 5.3.6; AS 1530.2	State the classification and index number results.
Surface Water Absorbency Classification	AS/NZS 4200.1 Appendix A clause A5; AS/NZS 4201.6	State classification.



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APPENDIX A

Document History

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0	22-05-2023	<ul style="list-style-type: none">Initial specification version