New Zealand Standard

Pliable, Permeable Building Underlays

NZS 2295:2006

Single User PDF Terms & Conditions

You have material which is subject to strict conditions of use. Copyright in this material is owned by the New Zealand Standards Executive. Please read these terms and conditions carefully, as in addition to the usual range of civil remedies available to Standards New Zealand on behalf of the New Zealand Standards Executive for infringement of copyright, under New Zealand law every person who infringes copyright may be liable to a fine of up to $10,000 for every infringing copy or imprisonment of up to 5 years, or a fine of up to $150,000 or imprisonment not exceeding 5 years.

You have access to a single-user licence to read this non-revisable Adobe Acrobat PDF file and print out and retain ONE printed copy only.

We retain title and ownership of the copyright in this PDF file and the corresponding permitted printed copy at all times.

Under this license use of both the PDF file and the single permitted printed copy of this PDF file you may make are restricted to you. Under no circumstances are you permitted to save, sell, transfer, or copy this PDF file, the one permitted printed copy of this PDF file, or any part of either of them.

You undertake that you will not modify, adapt, translate, reverse engineer, decompile, disassemble or create derivative works based on any of the downloaded PDF file, nor will you merge it with any other software or document, even for internal use within your organization.

Under no circumstances may this PDF file be placed on a network of any sort without our express permission.

You are solely responsible for the selection of this PDF file and any advice or recommendation given by us about any aspect of this PDF file is intended for guidance only and is followed or acted upon entirely at your own risk.

We are not aware of any inherent risk of viruses in this PDF file at the time that it is accessed. We have exercised due diligence to ensure, so far as practicable, that this file does not contain such viruses.

No warranty of any form is given by us or by any party associated with us with regard to this PDF file, and you accept and acknowledge that we will not be liable in any way to you or any to other person in respect of any loss or damage however caused which may be suffered or incurred or which may arise directly or indirectly through any use of this PDF file.

Regardless of where you were when you received this PDF file you accept and acknowledge that to the fullest extent possible you submit to New Zealand law with regard to this licence and to your use of this PDF file.

COMMITTEE REPRESENTATION

This Standard was prepared by the Technical Committee P 2295 for the Standards Council established under the Standards Act 1988.

The committee consisted of representatives of the following:

Nominating Organisations

Architectural Designers New Zealand (ADNZ)
Building Officials' Institute of New Zealand (BOINZ)
Building Research Association of New Zealand (BRANZ)
Business NZ
Certified Builders' Association of New Zealand
Cladding Institute of New Zealand (CINZ)
Department of Building and Housing
Design Association of New Zealand (DANZ)
New Zealand Building Industry Federation
New Zealand Metal Roofing Manufacturers Inc. (NZMRM)
Registered Master Builders' Federation
Roofing Association of NZ (RANZ)

ACKNOWLEDGEMENT

Standards New Zealand gratefully acknowledges the contribution of time and expertise from all those involved in developing this Standard.

Published by Standards New Zealand, the trading arm of the Standards Council, Private Bag 2439, Wellington 6140.
Telephone: (04) 498 5990, Fax: (04) 498 5994.
Website: www.standards.co.nz

AMENDMENTS

No.	*Date of issue*	*Description*	*Entered by, and date*

NZS 2295:2006

New Zealand Standard

Pliable, permeable building underlays

ISBN 1-86975-054-3

NOTES

CONTENTS

REFERENCED DOCUMENTS

Reference is made in this document to the following:

JOINT/ADOPTED AUSTRALIAN/NEW ZEALAND STANDARDS

AS/NZS 1301:	Methods of test for pulp and paper
Part 421s:1998	Determination of the pH value of aqueous extracts of paper, board and pulp – Cold extraction method
AS/NZS 4200:	Pliable building membranes and underlays
Part 1:1994	Materials
AS/NZS 4201:	Pliable building membranes and underlays – Methods of test
Part 3:1994	Shrinkage
Part 4:1994	Resistance to water penetration
Part 6:1994	Surface water absorbency
NZS/AS 1301:	Methods of test for pulp and paper
Part 448s:1991	Tensile strength of paper and paperboard
NZS/AS 1530:	Methods for fire tests on building materials, components and structures
Part 2:1993	Test for flammability of materials

AMERICAN STANDARDS

ASTM D882:2002	Standard test method for tensile properties of thin plastic sheeting
ASTM E96:2005	Standard test methods for water vapour transmission of materials
ASTM G154: 2006	Standard practice for operating fluorescent light apparatus for UV exposure of non-metallic materials

BRITISH STANDARD

BS 6538:	Air permeance of paper and board
Part 3:1987	Method for determination of air permeance using the Gurley apparatus

OTHER STANDARD

TAPPI T470:1986	Edge tearing resistance of paper (Edge-tear stirrup method)

NEW ZEALAND LEGISLATION

Department of Building and Housing, New Zealand Building Code (NZBC) and Compliance Documents

LATEST REVISIONS

The users of this Standard should ensure that their copies of the above-mentioned New Zealand Standards and referenced overseas Standards are the latest revisions or include the latest amendments. Amendments to referenced New Zealand and joint Australian/New Zealand Standards can be found on **www.standards.co.nz**

Foreword

This Standard gives the property requirements and test methods for pliable and permeable underlay material to be used for roofs and walls.

This Standard is limited to pliable breather type building underlays. This Standard does not include insulation, foils, rigid barriers, non-breather type pliable building underlays or vapour barriers.

NZS 2295:1988 was originally developed by way of amendment from BS 4016 *Specification for flexible building membranes (breather type).* That Standard was superseded by AS/NZS 4200.1:1994 *Pliable building membranes and underlays* and was subsequently withdrawn in 1999.

This present revision and reinstatement of NZS 2295 *Pliable, permeable building underlays* was driven by a need for a Standard that reflects up to date test methods and products that are currently in use within the New Zealand building industry. It is anticipated that further research into moisture management within roofs will drive a future amendment to this Standard.

The Standard is intended to provide practical guidance for manufacturers and importers of underlay material intended to be used in New Zealand, and for users specifying underlay to select the appropriate products.

This Standard sets out the provisions related to meeting compliance clauses within the New Zealand Building Code and provides practical information relating to industry best practice.

REVIEW OF STANDARDS

Suggestions for improvement of this Standard are welcome. They should be sent to the Chief Executive, Standards New Zealand, Private Bag 2439, Wellington 6140.

NEW ZEALAND STANDARD

PLIABLE, PERMEABLE BUILDING UNDERLAYS

1 GENERAL

1.1 Objective

The objective of this Standard is to provide for proof of compliance with the relevant sections of the following New Zealand Building Code clauses:

B2 DURABILITY

C3 SPREAD OF FIRE

E2 EXTERNAL MOISTURE

C1.1
Other requirements to do with the construction process such as temporary protection or allowing the transmittance of light are outside the scope of this Standard.

1.2 Scope

The scope of this Standard is as follows.

1.2.1 Wall underlays

The scope of this Standard includes wall underlays fitted:

(a) Behind wall claddings directly fixed to timber, steel framing or thermal breaks of the steel framing; and

(b) Behind battens that form a drained and ventilated cavity behind wall claddings fixed to timber or behind the thermal break of steel framing.

1.2.2 Roof underlays

The scope of this Standard includes roof underlays under roof claddings.

1.2.3 Materials outside scope

The scope of this Standard does not include:

(a) Rigid materials used in place of pliable wall or roof underlay;

(b) Pliable membranes used as insulation;

(c) Vapour barriers used under concrete slabs or suspended timber floors;

(d) Vapour barriers behind wall or roof claddings; or

(e) Foil laminates.

NOTE – Foil laminates used as underlay are covered in AS/NZS 4200.1.

1.2.4 Installation

This Standard does not cover installation; however, some guidance on recommended industry practice is provided in Appendix A to assist users to meet the requirements of this Standard.

1.3 Interpretation

For the purposes of this Standard, the word "shall" identifies a mandatory requirement for compliance with this Standard. The word "should" refers to practices which are advised or recommended.

1.3.1 Commentary clauses

Clauses prefixed by "*C*" and printed in italic type are intended as comments on the corresponding mandatory clauses. They are not to be taken as the only or complete interpretation of the corresponding clause, nor should they be used for determining in any way the mandatory requirements of compliance within this Standard.

1.3.2 Referenced documents

The full titles of reference documents cited in this Standard are given in the list of Referenced Documents immediately preceding the foreword.

1.3.3 Appendices

The terms "Normative" and "Informative" have been used in this Standard to define the application of the Appendix to which they apply. A "Normative" Appendix is an integral part of a Standard whereas an "Informative" Appendix is only for information and guidance.

1.4 Definitions

For the purposes of this Standard the following definitions shall apply:

ABSORBENT UNDERLAY. A roof underlay must absorb more than 150 g/m^2, and to be classified as absorbent, a wall underlay must absorb more than 100 g/m^2.

AIR BARRIER. An underlay that provides air flow resistance greater than 0.1 MN s/m^3.

APPLICATION. The intended use of the building underlay material (see Grade).

CAVITY. A free draining space, immediately behind a wall cladding, that has vents at the base of the wall.

CLADDING:

ABSORBENT. Cladding materials that will absorb water.

NON-ABSORBENT. Cladding materials that will not absorb water such as PVC weatherboards or profiled metal.

ROOF. The exterior weather-resistant roof surface of a building.

WALL. The exterior weather-resistant wall surface of a building.

DIRECT-FIXED. The method of attaching the wall cladding to the wall framing without the use of a cavity.

DIRECTION:

CROSS. The short direction of the pliable building underlay roll.

MACHINE. The lengthwise direction of the pliable building underlay roll.

EDGE TEAR RESISTANCE. The ability of underlay material to resist tearing at the fixing points.

GABLE END. The outside wall between the planes of the roof and the line of the eaves.

GRADE. The classification of underlay material within the type groupings (see Application).

KRAFT-BASED UNDERLAY. An underlay for use in either a wall or roof that is made of one or more layers of kraft paper.

LAPS:

END. An overlap of two rolls of material in the cross (short) direction.

SIDE. An overlap of two rolls of material in the machine (long) direction.

MARKING. Information indelibly scribed directly on to the underlay material.

PERMEABILITY. The ability of a material to allow gases or vapours to pass through. In this Standard, permeability is expressed by the inverse, i.e. as water vapour resistance (see definition of Water Vapour Resistance).

pH. A measure of the acidity or alkalinity of a material. The pH scale extends from 0 (very acid) to 14 (very alkaline) with a neutral material having a value of 7.

PLIABLE. The characteristic of a material that allows it to be formed into a roll without breaking or cracking, enabling a continuous sheet of underlay material to be produced and applied.

ROLL LABELLING. Information about underlay material that is provided on the exterior packaging of the roll.

ROOF. The enclosing part of the building that has its upper surface exposed to the outside and at an angle of 60^{o} or less to the horizontal.

ROOF UNDERLAY. An absorbent permeable building underlay, used as part of the building's water management system in the roof cladding system, that absorbs or collects condensation or water that may penetrate the roof cladding.

SELF-SUPPORTING. Roof underlay material with the ability to support its own weight across a minimum span of 1200 mm under normal working conditions.

SHRINKAGE. The percentage reduction of linear dimensions which occurs when the moisture content of underlays is reduced.

SYNTHETIC UNDERLAY. An underlay for use in a wall that is made from polymeric materials. Synthetic underlays can be classified as absorbent or non-absorbent.

TENSILE STRENGTH. The ability of underlay material to resist a maximum level of pulling, tension or stress force.

VAPOUR BARRIER. A material intended to restrict the transmission of water vapour.

WALL. The enclosing part of the building that has one surface exposed to the outside and at an angle of more than 60^{o} to the horizontal.

WALL UNDERLAY. A kraft-based building underlay or synthetic wrap used as part of the building's water management system in the wall cladding system, to assist the control of moisture which occasionally penetrates the cladding. In this Standard, wall underlays may be absorbent or non-absorbent. Rigid sheathings are not part of this Standard.

WATER MANAGEMENT SYSTEM. The weatherproof envelope of a building including building underlay, roof or wall claddings and their fixings, windows, doors and all penetrations, flashings, seals, joints or junctions and a drained cavity where applicable.

WATER RESISTANCE. The ability of underlay material to withstand water penetration.

WATER VAPOUR RESISTANCE. The ability of a material to resist the passage of water vapours (see Permeability).

2 WALL UNDERLAYS

2.1 Introduction

The wall underlay is one element of the water management system designed to control the passage of moisture and air in walls.

2.2 Material properties

To assist in moisture management, wall underlays are required to have the specific properties as described in this section. A summary of wall underlay classifications and properties is provided in Appendix B.

2.2.1 Water vapour resistance

Wall underlays shall have a water vapour resistance of 7 MN s/g or less when tested to ASTM E96 Procedure B.

2.2.2 Absorbency

To be classified under this Standard as absorbent, a wall underlay shall have an absorbency of 100 g/m^2 or greater when tested to AS/NZS 4201:Part 6. All other wall underlays shall be classified as non-absorbent.

2.2.3 Water resistance

Wall underlays shall have a resistance to water penetration of 20 mm or greater when tested to AS/NZS 4201:Part 4.

2.2.4 Shrinkage

Wall underlays shall be tested for shrinkage to AS/NZS 4201:Part 3. The test results will then determine the maximum run lengths as set out in table 2.1.

Table 2.1 – Maximum run lengths for wall underlays

Amount of shrinkage (%)	**Maximum run length** (metres)
0 % – 0.5 %	10
0.5 % – 1.5 %	7

2.2.5 pH extract

Wall underlays shall have a pH extract between 5.5 and 8.0 when tested to AS/NZS 1301.421s.

2.2.6 Mechanical strength

Wall underlays shall have mechanical strength properties to those specified in table 2.2 or greater.

Table 2.2 – Mechanical strength properties for wall underlays

Type	Grade	Edge tear resistance (N)		Tensile strength (KN/m)	
		Machine direction	Cross direction	Machine direction	Cross direction
W1 – Kraft	Standard	28	28	6	4
W2 – Kraft	Heavy	40	35	9	4.5
W3 – Synthetic	Non-absorbent	150	100	3	1
W4 – Synthetic	Absorbent	150	100	3	1

Wall underlays shall be tested using the methods specified in table 2.3.

Table 2.3 – Test methods for mechanical strength of wall underlays

Material type	Edge tear resistance	Tensile strength
Kraft-based underlays	TAPPI T470	NZS/AS 1301:448s
Synthetic-based underlays	TAPPI T470	ASTM D882

NOTE – A 50 mm sample shall be used when testing to the method in NZS/AS 1301:448s.

2.2.7 Flammability

Wall underlays claiming to be fire retardant shall have a Flammability Index (FI) of 5 or less when tested to NZS/AS 1530:Part 2.

2.2.8 Air resistance

When the walls or gable ends of a building are unlined and an air barrier is required, the underlay shall have an air resistance of 0.1 MN s/m^3 or greater when tested to BS 6538:Part 3.

2.2.9 Resistance to UV exposure

Wall underlays shall retain at least 85 % of their mechanical strength as specified in 2.2.6 when ultra-violet (UV) exposure testing has been undertaken as specified in ASTM G154, e.g. using the QUV apparatus fitted with UVA lamps. The test cycle shall consist of UV exposure for 8 hours at 60 °C. This is followed by dark condensation for 4 hours at 50 °C. For wall underlays rated for 2 months exposure prior to cladding, the standard total exposure time (UV and dark condensation periods combined) shall be 500 hours.

2.3 Application

For guidance on the underlay type for particular applications, see Appendix C.

2.3.1 Durability

All underlays shall comply with Clause B2, Durability, of the New Zealand Building Code.

2.3.2 Absorbency

All lined buildings shall have a wall underlay between the framing and the cladding.

There are various types of material that can be used for framing, battens, thermal breaks for steel framing, and for cladding. In addition there are two types of underlay, kraft-based and synthetic. Kraft-based underlays are absorbent and synthetic underlays can be non-absorbent or absorbent.

If a drained and vented cavity is present the underlay shall always be in direct contact with the framing. Where metal cladding or steel framing is used, the metal surface shall be separated by a kraft-based absorbent separator material from timber treated with copper-based chemicals.

Absorbent underlays shall be used in applications involving non-absorbent cladding or framing as follows:

(a) Where a metal cladding is directly fixed to framing, the underlay shall be absorbent and kraft-based;

(b) Where a plastic cladding is directly fixed to framing, the underlay shall be absorbent and either synthetic or kraft-based; and

(c) Where a steel-framed structure has direct-fixed cladding, the underlay shall be absorbent and kraft-based.

Table 2.4 shows common configurations of building materials when applying this requirement. Any other configurations can be determined by using the absorbency rules set out in 2.3.2 (a) to (c).

Table 2.4 – Underlay type based on absorbency configurations

Configuration	Cladding type	Required type of wall underlay
Direct-fixed		
Timber framing	Abs	Any (W1, W2, W3, W4)
Timber framing	Non-Abs	Abs (W1, W2 or W4)
Timber framing	Metal	AK (W1 or W2)
Steel framing	Abs or Non-Abs	AK (W1 or W2)
Cavity (1,2)		
Timber framing	Abs, Non-Abs or Metal (3)	Any (W1, W2, W3, W4)
Steel framing (3)	Abs, Non-Abs or Metal (3)	Any (W1, W2, W3, W4)

KEY –
Abs = Absorbent cladding or wall underlay
Non-Abs = Non-absorbent cladding
AK = Absorbent kraft-based wall underlay (Type W1 or W2)

NOTE –
(1) Cavity battens are typically H3.1 treated timber for timber framing and 20 mm styrene for steel framing, which also acts as a thermal break.
(2) A drained and vented cavity shall be as per E2/AS1.
(3) Metal cladding or steel framing must be separated from timber treated with copper-based chemicals.

2.3.3 Mechanical strength

The categories for strength of wall underlays are:

(a) W1 when the underlay will be clad within 1 month, and the wind zone is low or medium;

(b) W2 when the underlay will be clad within 1 month, and the wind zone is high or greater; or

(c) W3 and W4 when the underlay will be clad within 2 months for all wind zones.

See table B1 for the properties of building underlay types.

2.3.4 UV resistance

W1 and W2 wall underlays shall be covered by cladding within 1 month from being installed. W3 and W4 wall underlays shall be covered by cladding within 2 months from being installed.

3 ROOF UNDERLAYS

3.1 Introduction

The roof underlay is one element of the water management system designed to control the passage of moisture and air in roofs.

3.2 Material properties

To assist in moisture management, roof underlays are required to have the specific properties as described in this section. In this Standard, only kraft-based products are considered to be suitable for use as roof underlays. A summary of roof underlay classifications and properties is provided in Appendix B.

3.2.1 Absorbency

Roof underlay shall have an absorbency of 150 g/m^2 or greater when tested to AS/NZS 4201:Part 6.

3.2.2 Water resistance

All roof underlays shall have a water resistance of 100 mm or greater when tested to AS/NZS 4201:Part 4.

3.2.3 Shrinkage

Roof underlays shall be tested for shrinkage to AS/NZS 4201:Part 3. The test results will then determine the maximum run lengths as set out in table 3.1.

Table 3.1 – Maximum run lengths for roof underlays

Amount of shrinkage (%)	**Maximum run length** (metres)
0 % – 0.5 %	10
0.5 % – 1.5 %	7

3.2.4 pH extract

All roof underlays shall have a pH extract between 5.5 and 8.0 when tested to AS/NZS 1301.421s.

3.2.5 Mechanical strength

Roof underlays shall have mechanical strength properties to those specified in table 3.2 or greater.

Table 3.2 – Mechanical strength properties for roof underlays

Type	Grade	Edge tear (N)		Tensile strength (KN/m)	
		Machine direction	Cross direction	Machine direction	Cross direction
R1 – Kraft	Heavy	40	35	9	4.5
R2 – Kraft	Self-supporting	70	55	11	6

Roof underlays shall be tested to the methods specified in table 3.3.

Table 3.3 – Test methods for mechanical strength of roof underlays

Material type	Edge tear	Tensile strength
Kraft-based underlays	TAPPI T470	NZS/AS 1301:448s

NOTE – A 50 mm sample shall be used when testing to the method in NZS/AS 1301:448s.

3.2.6 Flammability

Roof underlays claiming to be fire retardant shall have a Flammability Index (FI) of no more than 5 as tested to NZS/AS 1530:Part 2.

3.3 Application

For guidance on the underlay type for particular applications, see Appendix C.

3.3.1 Durability

All underlays shall comply with Clause B2, Durability, of the New Zealand Building Code.

3.3.2 Mechanical strength

The categories for strength of roof underlays are as follows:

(a) R1 – all situations when fully supported; except

(b) R2 – when the underlay is self-supporting to a maximum span of 1200 mm.

3.3.3 UV resistance

Roof underlays shall be covered within 1 week of being installed.

Roof underlay in-service shall not be exposed to external elements to prevent the absorption of potentially corrosive contaminants.

4 IDENTIFICATION

4.1 Synthetic underlays

4.1.1 Marking

Synthetic underlays shall be marked with the product identifier in a manner which facilitates identification after installation. This marking shall:

(a) Be on at least one face of the underlay;

(b) Be repeated at distances of less than 2 m in any direction;

(c) Be located at least 150 mm from the material edge;

(d) Enable identification of the manufacturer; and

(e) If critical to the performance of the underlay, specify the orientation and external face.

Additional roll labelling shall be allowed. Such additional roll labelling shall not interfere with the roll labelling required by this Standard.

4.1.2 Roll labelling

Rolls of underlay shall bear an indelibly marked label in a manner which facilitates identification prior to installation. This roll label shall:

(a) Be located on the outer curved surface of the roll, either outside any roll packaging or underneath any transparent roll packaging;

(b) Bear information enabling users to identify the following:

(i) Manufacturer

(ii) Roll size

(iii) Material type, grade and application, and

(iv) Material batch;

(c) Bear a statement of compliance with this Standard;

(d) Bear a statement that the underlay is fire retardant (if applicable); and

(e) Bear a statement that advises users on appropriate installation.

Additional roll labelling shall be allowed. Such additional roll labelling shall not interfere with the roll labelling required by this Standard.

4.2 Kraft-based underlays

4.2.1 Marking

Kraft-based underlays require no marking on the underlay itself.

4.2.2 Roll labelling

Rolls of underlay shall bear an indelibly marked label in a manner which facilitates identification prior to installation. This roll label shall:

(a) Be located on the outer curved surface of the roll, either outside any roll packaging or underneath any transparent roll packaging;

(b) Bear information enabling users to identify the following:

  (i) Manufacturer

  (ii) Roll size

  (iii) Material type, grade and application, and

  (iv) Material batch;

(c) Bear a statement of compliance with this Standard;

(d) Bear a statement that the underlay is fire retardant (if applicable);

(e) Bear a statement that advises users on appropriate installation; and

(f) Bear a statement that describes the maximum run length allowed.

Additional roll labelling shall be allowed. Such additional roll labelling shall not interfere with the roll labelling required by this Standard.

APPENDIX A
UNDERLAY INSTALLATION

(Informative)

A1 This appendix provides guidance for users reflecting current installation practices to assist with meeting the normative sections of this Standard.

A2 Laps Laps of wall and roof underlays should be as shown in table A1. All endlaps should be over framing members or other solid backing.

Table A1 – Requirements for laps in building underlay

Application		Minimum overlap	
		Sidelaps (mm)	**Endlaps** (mm)
Wall underlay	Kraft-based	75	100
	Synthetic	100	100
Roof underlay	Horizontal	150	150
	Vertical	150	150

A3 Direction

A3.1 Roll size of all underlays should be such as to minimise the laps in the installation.

A3.2 Wall underlays should be run horizontally. Wall underlays should be run so as to minimise all laps. Endlaps should be kept to a minimum and should only occur over solid backing.

A3.3 Roof underlay should be run horizontally or vertically depending on how it is to be fixed.

A3.4 If the roof underlay runs over, and is fixed to the top of, purlins then it should be run vertically (i.e. perpendicular to the purlins).

A3.5 If the roof underlay runs over and is fixed to rafters or trusses, and under purlins or battens, then it should be run horizontally (i.e. perpendicular to the rafters or trusses).

A3.6 For wall underlays and where roof underlays are run horizontally, the upper sheets should lap over the lower sheets to ensure water is shed to the outside face of the underlay.

A3.7 Where roof underlay is run vertically, the upper layer at a sidelap should be laid so that the prevailing wind at the time of installation blows over, not into, the lap.

A4 Fixings

A4.1 Fixing for wall underlays

A4.1.1

For masonry veneer the fixings should be suitable for the permanent installation of the wall underlay without any assistance from the cladding.

A4.1.2

For other cases where the fixings are temporary and the permanent installation relies on the cladding to hold the wall underlay on, the type and frequency of the temporary fixings should be determined by:

(a) Type and method of attachment of the cladding;

(b) The probable maximum time before the cladding is installed; and

(c) The expected weather conditions during this period.

A4.1.3

For direct-fix cladding to timber frames, install the building underlay with PVC tape run horizontally over the building underlay at a maximum of 800 mm centres to coincide with the nogs and dwang lines. Fix underlay with tape and staples (minimum 8 mm leg and galvanised) at 300 mm centres both ways to studs, nogs and dwangs. Fix the tape ends securely, particularly at any openings for doors or windows.

For drained and vented cavity systems to timber wall frames, install the building underlay in conjunction with and under the cavity battens.

A4.2 Fixings for roof underlays

For roof underlay laid during roof or batten installation, the fixings used will normally be permanent. This can be either through the roof, the battens or purlins, although staples can be used as temporary fixings if required.

A5 Steel framing

When steel framing is used under a direct-fixed cladding the underlay should be placed between the outside of the thermal break and the cladding and be of a type determined by 2.3.2.

Where there is a cavity the underlay should be placed between the framing and the inside of the thermal break/cavity batten and be of a type determined by 2.3.2. If additional underlay is placed between the cavity battens and the cladding, then it should have absorbency suitable for the cladding (see 2.3.2).

A6 Repairs before cladding installation

A6.1 Repairs to walls

A6.1.1

Holes less than 25 mm or rips less than 75 mm should be repaired using a compatible flexible flashing tape such as is used for window flashings. This needs to be supported from behind while being applied to ensure firm and permanent adhesion to the underlay.

A6.1.2

Holes or rips larger than these sizes are classed as damage, which should be repaired by covering with a new sheet of the same material running horizontally from stud to stud and fixed to the studs, and extending from 150 mm below the damage to lap under the sheet above or the nearest flashing above, or the top of the wall, whichever is closest. Laps above the damage do not need to be taped.

A6.2 Repairs to roofs

A6.2.1

Roof underlay damage should not be repaired by patching but only by new lengths of underlay material. Roof underlay run horizontally should be repaired in the same way as walls, i.e. running from rafter to rafter and fixed to them, and from 150 mm below the damage up to and under the next sidelap.

A6.2.2

For roof underlay run vertically over purlins, the new full width sheet should be run from (and fixed to) the purlin below the damage to two purlins above the damage, where it is fitted under the old sheet and fixed to the purlin.

A7 Compatibility

A7.1 Different types of claddings

Where different claddings are used on the same building, care should be taken that the appropriate underlay is used under each type of cladding.

A7.2 Accessories

Where accessories such as tapes for jointing, or tapes for sealing around windows and other openings are required, the compatibility of tapes and underlay should be checked with the manufacturers of both products.

A7.3 Structure

Ensure that the building underlay is compatible with the structure to which it is being fixed.

APPENDIX B
UNDERLAY CLASSIFICATION

(Normative)

B1 This appendix specifies properties for underlay material. For a summary of the material properties required by the underlay types, see table B1.

Table B1 – Classification of building underlay types

Type	Grade	Property							
		WVR	Abs	WR	Edge tear resistance		Tensile		UV resistance time uncovered
					MD	CD	MD	CD	
	Units	MN s/g	g/m^2	mm	N	N	KN/m	KN/m	
	Clause(s)/tables	2.2.1	2.2.2 & 3.2.1	2.2.3 & 3.2.2	Tables 2.2 and 3.2				2.3.4 & 3.3.3
W1	Kraft – Standard weight	≤ 7	≥ 100	≥ 20	≥28	≥ 28	≥ 6	≥ 4	≤ 1 month
W2	Kraft – Heavy weight	≤ 7	≥ 100	≥ 20	≥40	≥ 35	≥ 9	≥ 4.5	≤ 1 month
W3	Synthetic – Non-absorbent	≤ 7	N/A	≥ 20	≥150	≥ 100	≥ 3	≥ 1	≤ 2 months
W4	Synthetic – Absorbent	≤ 7	≥ 100	≥ 20	≥150	≥ 100	≥ 3	≥ 1	≤ 2 months
R1	Kraft – Heavy weight	N/A	≥ 150	≥ 100	≥40	≥35	≥ 9	≥ 4.5	≤ 1 week
R2	Kraft – Self-supporting	N/A	≥ 150	≥ 100	≥70	≥55	≥ 11	≥ 6	≤ 1 week

KEY –

WVR = Water vapour resistance

Abs = Absorbency

WR = Water resistance

MD = Machine direction (long)

CD = Cross direction (short)

NOTE – When walls or gable ends of a building are unlined and an air barrier is required, the underlay shall have an air resistance of 0.1 MNs/m^3 or greater when tested to BS 6538:Part 3.

B2 Underlays can be damaged by inclement weather prior to cladding being installed. Unlike precipitation or wind, UV exposure has a cumulative effect on the durability of the material. For this reason limits are set on the time underlays shall be left uncovered.

APPENDIX C
UNDERLAY APPLICATIONS

(Informative)

C1 Users should consult table C1 for guidance on the appropriate wall underlay type for different applications.

Table C1 – Wall underlay applications

Cladding type	Fixing method	Wind load zone	
		Low & medium	High & very high
Absorbent	Direct	W1/W2/W3/W4	W2/W3/W4
Non-absorbent metal based	Direct	W1/W2	W2
Non-absorbent PVC based	Direct	W1/W2/W4	W2/W4
Absorbent or non-absorbent	Cavity	W1/W2/W3/W4	W2/W3/W4

C2 Users should consult table C2 for guidance on the appropriate roof underlay type for different applications.

Table C2 – Roof underlay applications

Rafter spacing	Support	Wind load zone	
		Low & medium	High & very high
<1200 mm	Supported	R1	R1
<1200 mm	Unsupported	R2	R2
>1200 mm	Supported	R2	R2

C3 See Appendix B for the material property specifications for underlay types.

NOTES

Approved by the Standards Council on 27 September 2006 to be a New Zealand Standard pursuant to the provisions of section 10 of the Standards Act 1988.

First published: 28 September 2006

The following SNZ references relate to this Standard:

Project No. P 2295
Draft for comment No. DZ 2295
Typeset and printed by: Standards New Zealand