BUILD RIGHT

Selecting a flexible wall underlay

THE RANGE OF FLEXIBLE WALL UNDERLAYS AVAILABLE CAN MAKE CHOOSING AN APPROPRIATE ONE DIFFICULT. SO WHAT ARE THE OPTIONS AND HOW DO YOU SELECT THE CORRECT WALL UNDERLAY?

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FLEXIBLE WALL UNDERLAYS – often referred to as building wraps, wall wraps or building paper – are an integral part of wall cladding systems for timber and steel-framed buildings. Fixed directly to the studs, they act as a second line of defence against water entry into framing and in some instances may function as an air barrier.

The specific wall underlay to be used on a project should be identified in the consent documents – it should not be left to the builder on site to decide what to use.

What E2/AS1 says

E2/AS1 requires a wall underlay to be installed behind all external wall claddings and the underlay to meet the Table 23 absorbency performance requirements where direct-fixed non-absorbent claddings are used. Table 23 references NZS 2295:2006, which sets the requirements for water vapour resistance (breathability), shrinkage, absorbency (a minimum absorbency requirement in Table 23 of 100 g/m² only applies for direct-fixed non-absorbent claddings), water resistance, pH extract, mechanical strength and UV resistance.

Permeable or breather-type underlays allow air/vapour to flow through the membrane, enabling vapour pressure equalisation while resisting water movement. Note that water vapour resistance (the inverse of permeability) is the ability of a material to resist the passage of water vapour.

Where a flexible wall underlay is used as an air barrier, that is, where there is no internal wall lining (such as in an unlined gable end wall) or the internal lining is not airtight, the underlay must also meet specific performance requirements given in Table 23 for an air barrier. This also includes additional requirements for edge tear strength and air resistance.

To be called fire retardant, a flexible underlay must have a flammability index (FI) of 5 or less when tested to AS/NZS 1530 Part 2.

Options for wall underlay

Options for flexible wall underlay materials include:

- kraft paper – bitumen impregnated or fire retardant
- synthetic – fire retardant or non-fire retardant and/or absorbent or non-absorbent

Absorbent or non-absorbent

Kraft papers are classified as absorbent. Synthetic underlays can be either absorbent or non-absorbent.

Claddings are also defined as being absorbent or non-absorbent. Absorbent claddings include timber, plywood, fibre-cement sheet and stucco. Profiled metal and plastic are non-absorbent cladding materials.

Selecting an underlay

Absorbent wall underlays may be used with all claddings in both direct-fix and drained and vented cavity situations.

Non-absorbent wall underlays may be used with:

- absorbent claddings that are direct fixed
- non-absorbent and absorbent claddings for drained cavity construction – the battens provide separation between the cladding and the underlay.

E2/AS1 requires kraft paper underlay to be used with direct-fixed vertical profiled metal claddings.

For horizontal profiled metal cladding, which must always be installed over a drained and vented cavity under E2/AS1, a kraft paper underlay must be installed between timber cavity battens treated with a copper-based timber preservative and the metal cladding. Alternatively, instead of full underlay over the battens, strips of kraft paper roof or wall underlay may be fixed to the face of the timber cavity battens.

Kraft vs synthetic

Differences between kraft paper and synthetic underlays include that synthetic underlays are:

- available in wider rolls – up to 2.7 m wide
- translucent – useful during construction when the building has been enclosed in underlay and before window and door cut-outs have been made
- more resistant to tears and puncturing
- more tolerant of dampness.

Easy to spot different underlays

Wall underlays are easily identifiable:

- Bitumen-impregnated kraft paper is black.
- Fire-retardant non-bituminous kraft paper is orange/brown.
- Non-absorbent synthetic wall underlay is thin and may be noisier in the wind once fixed and before claddings are installed.
- Absorbent synthetic wall underlay is generally thicker and softer than non-absorbent synthetic wall underlay and is less likely to be noisy in windy conditions.

Fixings and flashings

Flexible flashing tape installed around openings and penetrations must be compatible with the wall underlay and installed as shown in E2/AS1.

Flexible wall underlay fixings (in accordance with NZS 2295:2006) may be temporary or permanent:

- For masonry veneer cladding, fixings must be permanent without any reliance on the cladding to hold the wall underlay in place. For veneer claddings, the wall underlay requires not less than 50-year durability.
- For other claddings, initial fixing may be temporary – permanent fixing occurs when the cavity batten or wall cladding is fixed. The fixing for the temporary attachment depends on the cladding type, time until cladding installation and expected weather conditions over this time. Secure wall underlay by stapling or screwing to framing members at 300 mm centres.
- For drained and vented cavity construction, where the cavity batten spacing exceeds 450 mm, the wall underlay must be restrained to prevent it bridging the cavity when the insulation is installed. Options include installing an additional vertical batten, taut polypropylene tape or galvanised wire horizontally over the underlay at 300 mm centres maximum or covering the wall underlay with 75 mm galvanised mesh or wire. The ends of the tape, wire or mesh must be fixed securely at door and window openings.
- For drained and vented cavity systems, flexible wall underlay is installed before the cavity battens.

Beware of weather and UV exposure

All current wall underlays have a maximum weather or UV exposure specified (typically 1 or 2 months) to ensure the underlay is sound and will remain durable when the cladding covers it. NZS 2295:2006 also specifies a maximum weather exposure for the different classifications of flexible underlay.

The exposure limits may influence the underlay selection, particularly on larger complex projects where there may be a time lapse between the wall underlay installation and the cladding installation.

The installation instructions for kraft paper-based wall underlays specify that they should not get wet before the cladding is installed.

While flexible wall underlays are water resistant, they are not waterproof and should **never** be used as a weatherskin to allow insulation and linings to be completed before the cladding is installed.