

EVALUATION METHOD

No. 5 (2005)

TEST PROCEDURE FOR ADHESIVE, PRIMERS AND SEAM TAPES FOR BUTYL AND EPDM RUBBER WATERPROOFING MEMBRANES



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1. Scope

This test method and reporting covers testing of adhesives, primers and seam tapes for Butyl and EPDM Rubber waterproofing membrane systems. The Butyl and EPDM Rubber membranes shall comply with the New Zealand Building Code Clause E2 External Moisture Acceptable Solution E2/AS1 [Amendment 2, July 2005] paragraph 8.5.4(a) and (b). This test method does not cover the durability or application of membranes to specific substrates other than plywood substrates that comply with the Acceptable Solution E2/AS1 [Amendment 2, July 2005].

Conformance with the requirements of this evaluation method satisfies the requirements of the New Zealand Building Code Acceptable Solution E2/AS1 [Amendment 2, July 2005] paragraph 8.5.4(c).

2. Apparatus and materials

Universal testing machine complying with ISO 7500-1:1999 [test procedures 5.1.3, 5.1.4, 5.3.3 and 5.3.4]

Conditioning chambers capable of maintaining $23^{\circ}\text{C} \pm 2^{\circ}\text{C} / 75\% \text{ RH}$

3. Test Specimens

The manufacturer or their approved applicator shall prepare test specimens in accordance with the technical instructions for the Butyl and EPDM rubber membranes. Samples of the butyl and EPDM, including the plywood substrate shall be representative of the membrane system as made available in the market. In cases where a manufacturer has identical products with two or more thicknesses, the EM5 testing must be performed on the thinnest product. The results from these tests will be transferable to the thicker products.

3.1 Lap Joint Adhesion

All joints shall be prepared in accordance with the manufacturer's recommendations (including all recommended materials and procedures). Straight specimens shall be 25 mm wide strips cut at right angles across the joint, and tested under general conditions of ASTM D412 (Standard Test Method for Rubber Properties in Tension), using a grip separation rate of 500 ± 50 mm per minute.

Samples (5) shall be conditioned at room temperature ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) for a minimum of seven days before testing. A second set of samples (5) from the same assembly shall be aged in an oven operating at 115°C for 7 days, and allowed to rest for a minimum of 24 hours before testing. A third set of samples (5) shall be immersed in water at ambient temperature for a

period of seven days, and allowed to rest for a minimum of 24 hours and a maximum of 36 hours before testing.

Acceptance for Lap Joint Adhesion:

The five specimens from each set shall be tested, and the minimum average force required to cause joint separation or membrane breakage shall be:

- Joints with seam tape: 100 Newtons (unaged)
- Joints with seam tape: 90 Newtons (oven-aged or after water immersion)
- Joints with adhesive only: 80 Newtons (unaged)
- Joints with adhesive only: 60 Newtons (oven aged or after water immersion)

Note: Please refer New Zealand Building Code Clause E2 External Moisture Acceptable Solution E2/AS1 [Amendment 2, July 2005] Paragraph 8.5.5.2 for an explanation of when it is acceptable to use an adhesive only joint.

3.2 Bonding to Plywood

Plywood substrate used for the samples shall comply with the Acceptable Solution E2/AS1, as per paragraphs 8.5.3 and 8.5.5.1 and as made available in the market. Membrane bonded to plywood, using materials and procedures in accordance with the manufacturer's recommendations, shall be tested after conditioning at room temperature ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) for a minimum of seven days after manufacture.

Test specimens shall be 25 mm wide strips prepared according to the general conditions of ASTM D903 (Standard Test Method for Peel or Stripping Strength of Adhesive Bonds), using a grip separation rate of 500 ± 50 mm per minute.

Acceptance for Membrane Bonding:

Five strips shall be cut and tested, the minimum average force required to peel the membrane from the plywood shall be:

- Membrane bond to plywood: 5 Newtons.

4. Reporting

The report shall contain the following:

- Test date and report number
- Testing Agency and contact details
- Detailed specimen description and identification. All materials, including the plywood substrate and its treatment must be uniquely identified and not described generically. The information shall include specific details of the membrane being tested, including thickness, colour, primer, seaming tape, adhesive etc.
- The results of each test and all relevant observations on the behaviour or performance of the test samples with a summary of each test result as 'acceptable' or 'unacceptable'.
- A summary statement of overall conformance or non-conformance.

5. Referenced Documents

ISO 7500-1:1999: Metallic Materials - Verification of Static Uniaxial Testing Machines - Part 1: Tension/Compression Testing Machines - Verification and Calibration of the Force-Measuring System

New Zealand Building Code [NZBC] Acceptable Solution E2/AS1 [July 2005]

ASTM D412-Standard Test methods for Rubber Properties in Tension

ASTM D903-Standard Test Method for Peel or Stripping Strength of Adhesive Bonds