ICC EVALUATION SERVICE, INC.
Evaluate ■ Inform ■ Protect

June 9, 2008

TO: **PARTIES INTERESTED IN EVALUATION REPORTS ON VAPOR PERMEABLE MEMBRANES**

SUBJECT: Acceptance Criteria for Vapor Permeable Membrane Used with Concealed Attics and Roof Spaces, Subject AC342-0508-R1 (SP/RB)

Dear Madam or Sir:

Enclosed is a copy of the subject new acceptance criteria approved by the ICC-ES Evaluation Committee on May 29, 2008, with an effective date of June 1, 2008.

This new criteria establishes requirements for a vapor permeable membrane (VPM) used to form two air spaces below roof sheathing, for the purpose of reducing air movement in the attic space.

The acceptance criteria applies only to products that have the same characteristics as the product described in the application by E. I. DuPont de Nemours and Company, Inc. We recognize there may be other companies that have similar products but whose characteristics may not be the same as those described in the application. Subsequent applicants may either comply with the subject criteria, request a revision to the criteria to include their product, or be considered under a new acceptance criteria, as determined by the Evaluation Committee.

If you have any questions, please contact Sabrina Pott, E.I., at (800) 423-6587, extension 4321. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

Kurt Stochlia, P.E.
Vice President

KS/raf

Enclosure

cc: Evaluation Committee

ACCEPTANCE CRITERIA FOR VAPOR PERMEABLE MEMBRANE USED WITH CONCEALED ATTICS AND ROOF SPACES

AC342

Approved May 2008

Effective June 1, 2008

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

> The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (**I**) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (➜) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

Acceptance criteria are developed for use solely by ICC-ES for purpose of issuing ICC-ES evaluation reports.

ACCEPTANCE CRITERIA FOR VAPOR PERMEABLE MEMBRANE USED WITH CONCEALED ATTICS AND ROOF SPACES

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for a vapor permeable membrane (VPM) used to form an air space below the roof sheathing for the purpose of reducing air movement in the attic space. The permeability of the membrane is such that moisture vapor can migrate from the enclosed attic space through the membrane into the air space above the membrane and below the roof sheathing. The moisture in the airspace is swept out using ridge and soffit vents by natural air currents. The VPM is to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*® (IBC) and the 2006 *International Residential Code*® (IRC). The reason for this criteria is the absence of reference standards in either the IBC or IRC which could be used to determine the code compliance of this product used in this application. The subject of this criteria is an alternative material to what is prescribed in the codes. Bases of recognition are IBC Section 104.11 and IRC Section R104.11.

1.2 Scope: VPMs that comply with this criteria are used to control moisture vapor in enclosed attic spaces, as an alternate to the attic ventilation requirements prescribed in the codes. The VPM consists of a flexible sheet membrane intended to be moisture vapor permeable while at the same time resisting liquid (bulk) water penetration and air leakage. The VPM is installed over rafters or trusses and secured with the manufacturer's $^{3}/_{64}$-inch-thick (1.2 mm) (maximum) PVC joist caps to create a minimum $1^{1}/_{2}$-inch (38.1 mm) air space between the top of the VPM and the bottom of the code-complying roof deck. The VPM is installed so that the horizontal overlaps are shingled to shed water and taped to prevent airflow from above into the attic space. Attic moisture will diffuse through the VPM into the air space and be removed by continuous natural soffit and ridge venting. The assembly serves to remove moisture vapor by means of diffusion, resulting in passive moisture removal. This system provides equivalent moisture control that is achieved through conventional attic ventilation, prescribed by the IBC Section 1203.2 and IRC Section 806.

Recognition of the membrane under this criteria is limited to residential buildings.

1.3 Codes and Referenced Standards:

1.3.1 ASTM D 1922-06a, Standard Test Method for Propagation of Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method, ASTM International.

1.3.2 ASTM E 84-04, Test Method for Surface Burning Characteristics of Building Materials, ASTM International.

1.3.3 ASTM E 96-00e01, Test Method for Water Vapor Transmission of Materials, ASTM International.

1.3.4 2006 *International Building Code*® (IBC), International Code Council.

1.3.5 2006 *International Residential Code*® (IRC), International Code Council.

1.3.6 2006 *International Energy Conservation Code*® (IECC), International Code Council.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, thickness, size and the manufacturing process.

2.1.2 Installation Instructions: Installation details and limitations, fastening methods, joint treatments, and face treatments.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the membrane. Identification provisions shall include the evaluation report number.

2.1.4 Field Preparation: A description of the methods of field-cutting, application and finishing.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Sampling of the membrane for tests under this criteria shall comply with Section 3.2 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Water-vapor Transmission: Reports shall be submitted of water-vapor transmission testing, performed in accordance with Procedure A of ASTM E 96 demonstrating a minimum water-vapor transmission rate of 20 U.S. perms (114 kg/(Pa·s·m^2), along with installation instructions demonstrating methods of installation designed to maintain active air channels above the membrane to ventilate any moisture accumulation.

3.2 Tear Resistance: Reports of tear resistance testing performed in accordance with ASTM D 1922. The condition of acceptance is a minimum of 6.34 pounds (2880 grams) in the cross direction and machine direction.

3.3 Surface Burning Characteristics: Reports of fire testing performed in accordance with ASTM E 84. The flame-spread index shall not exceed 25, and the smoke-developed index must not exceed 450.

3.4 Pliability: Reports of pliability testing performed in accordance with Table 1 of AC188.

3.5 Accelerated Aging: Reports of accelerated aging testing performed in accordance with Table 1 of AC188 and Section 4.7 of AC48.

3.6 UV Exposure: Reports of UV exposure testing performed in accordance with Table 1 of AC188 and Section 4.8 of AC48.

3.7 Air Permeability: Reports of air permeability testing performed in accordance with ASTM E 2178. The maximum test result shall be 0.02L/s/m^2 @ 75 Pa.

3.8 Tensile Strength: Reports of tensile strength testing performed in accordance with Table 1 of AC188 and Section 4.1 of AC48.

3.9 Long-term Sag: This is conducted only on 18- or 21-inch-by-48-inch (457 or 533 by 1219 mm) samples conditioned as per Section 3.6. The fixture used for the ultraviolet exposure test can be used, except the ultraviolet lamps are replaced by regular 100-watt lamps. A 12-inch-by-48-inch (305 by 1219 mm) sample is cut from the middle of the conditioned specimen.

Test Procedure:

a. Temperature shall be maintained at 100°F (38°C).

b. Specimen is placed over three 2-inch (50.8 mm) nominal width rafters spaced at 24 inches (610 mm) on center with ends nailed to the outermost rafters.

c. A 1-pound (0.454 kg) sand bag is placed at the center of each span.

d. Initial sag at the span centerline is to be recorded.

e. After 48 hours, sag at the same location is again recorded.

Condition of acceptance is that the final sag shall not exceed the initial sag by more than 5 percent.

3.10 Fire Testing of PVC Joist Caps: Joist caps shall be tested in accordance with ASTM E 84 and achieve a maximum flame-spread index of 25 and a maximum smoke-developed index of 450.

4.0 QUALITY CONTROL

4.1 Quality control documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

4.2 The product shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service (IAS) or otherwise acceptable to ICC-ES.

5.0 EVALUATION REPORT RECOGNITION

5.1 The minimum air space required to be maintained between the membrane and roof deck shall be indicated.

5.2 The minimum clearance required to be maintained to vents from heat-producing appliances and equipment must be provided in accordance with the 2006 *International Mechanical Code*®.

5.3 The report shall be limited to residential construction.

5.4 Perm rating of the vapor permeable membrane shall indicated.

5.5 Surface burning characteristics shall be indicated.

5.6 A statement shall be included in the report indicating that the installation of the system shall be approved by the code official and that roof diaphragm nailing requirements shall be addressed.

5.7 A vapor barrier at ceiling level shall be installed in accordance with the *International Energy Conservation Code*®. ■