

## ENVIRONMENTAL CRITERIA FOR DETERMINATION OF VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS OF INSULATION

### EC117

Effective date: October 1, 2012

#### PREFACE

ICC-ES issues Environmental Criteria (ECs) to provide interested parties with information on the requirements for obtaining an ICC-ES Verification of Attributes Report (VAR). An ICC-ES VAR provides independent verification of a manufacturer's environmental claims and product attributes. ECs address the production stage of the report subject, beginning with raw material acquisition through final manufacturing and packaging, and may also include information on projections for installation, use, reuse, and end-of-life, where specifically stated therein. This EC is effective as of the date referenced above and may be amended from time to time.

All VARs must comply with the EC in effect on the date of issuance or reissuance of the report. Any technical changes to the EC will be marked within the EC. A solid vertical line (|) shall be placed in the margin within the EC to indicate a change, addition, or deletion from the previous edition. A deletion indicator (➔) shall be placed in the margin where wording has been deleted.

ICC-ES may consider alternate approaches to those contained in this EC, provided the applicant submits valid data demonstrating that the alternate approach is at least equivalent to the requirements set forth in this EC, subject to approval by ICC-ES staff. Notwithstanding that a product, material, or type or method of construction meets the requirements set forth in this EC, or that it can be demonstrated that valid alternate ECs are equivalent to the requirements in this document, ICC-ES retains the right to refuse to issue or renew a VAR, 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 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.

The EC is limited to the scope statement in Section 1.2 and is not intended to construe a comprehensive environmental claim where considerations are given to other environmental trade-offs, impacts or full life cycle assessment.

**Note: The Preface of ICC-ES environmental criteria was revised in February 2012 to reflect changes in policy .**

**Environmental Criteria are developed for use solely by ICC-ES for purpose of issuing ICC-ES VARs.**

# ENVIRONMENTAL CRITERIA FOR DETERMINATION OF VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS OF INSULATION (EC117)

## 1.0 INTRODUCTION

**1.1 Purpose:** This document provides a procedure for determination of the type and amount of volatile organic compound (VOC) emissions of insulation, for recognition in an ICC-ES Environmental Programs, Verification of Attributes Report (VAR).

**1.2 Scope:** This document is applicable to insulation. Reports issued under this environmental criteria (EC) address raw material acquisition and production stages. Life cycle assessment considerations are outside the scope of this EC. Report users are responsible for determining compliance with applicable codes, standards and environmental regulations.

**1.3 Applicability:** VOC emissions of insulation shall be based on the criteria in the following:

- 1.3.1 IgCC Section 806.6
- 1.3.2 CALGreen Section A5.504.4.8
- 1.3.3 ICC 700 Section 901.11
- 1.3.4 ASHRAE Standard 189.1 Section 8.5.2
- 1.3.5 ANSI/GBI 01-2010 Section 12.2.1-C
- 1.3.6 LEED for Homes Credit MR2.2

### 1.4 Referenced Documents:

**1.4.1** 2012 *International Green Construction Code*<sup>TM</sup> (IgCC), International Code Council.

**1.4.2** 2010 *California Green Building Standards Code* (CALGreen), California Building Standards Commission.

**1.4.3** 2008 National Green Building Standard<sup>TM</sup> (ICC 700), National Association of Homebuilders.

**1.4.4** ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, Standard for the Design of High-Performance Buildings (Except Low-Rise Residential Buildings), American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

**1.4.5** ANSI/GBI 01-2010, Green Building Assessment Protocol, Green Building Initiative, Inc.

**1.4.6** LEED<sup>®</sup> for Homes Rating System, Version 2008, U.S. Green Building Council, Inc.

**1.4.7** ASTM D5116-10, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products, ASTM International.

**1.4.8** CDPH/EHLB/Standard Method V1.1, Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010, California Department of Health Services<sup>1</sup>.

**1.4.9** GGTM.P066, Standard Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes, and Furnishings Using Dynamic Environmental Chambers, August 2011, GREENGUARD Environmental Institute.

## 1.5 Terms and Definitions:

**1.5.1 Volatile Organic Compound (VOC):** A volatile chemical compound based on carbon chains or rings that typically contain hydrogen and sometimes contain oxygen, nitrogen and other elements and that has a vapor pressure greater than 0.1 mm of mercury at room temperature. (IgCC Section 202).

## 2.0 REQUIRED DATA

**2.1 Product Description:** Information on the product to be evaluated. The information shall include the product name, style, part or model number, physical description, and a production flowchart with respect to amount and type of VOC-emitting components, as well as the overall manufacturing process. Additionally, all relevant specifications must be provided for the product, the components and/or constituents used to manufacture the product, and the components used with the product in the final assembly. Specifications must be consistent with the products as described in the submitted test reports and quality documentation. As an example, for mixed materials (wet and dry), the following must be provided:

- i. Specifications of incoming materials, or the date of the signed, controlled document that describes each constituent and its specification.
- ii. Mix ratios of the constituents, or the date of the signed, controlled document that describes the mix ratio.
- iii. Finished product specifications (for example, for wet products, specific gravity and viscosity; for formed products, weight, compressive strength, etc.).

When agreed to by ICC-ES, in lieu of providing the actual specifications, the applicant may identify the controlled document that describes the product specifications, provided the document is identified by a revision level and/or date.

When the product specifications are not provided to ICC-ES except through reference to a controlled document as described in the preceding paragraph, the controlled document describing the product specifications shall be made available to the inspection agency for their review and their verification, during the qualifying inspection described in Section 3.3, that the product specifications are consistent with the product described in the original qualifying data.

**2.2 Packaging and Identification:** A description of the packaging method and field identification of the product shall be submitted. Identification shall include the ICC-ES VAR number.

**2.3 VOC Emissions:** The results of testing to determine the specific VOC emission rate in accordance with ASTM D 5116, utilizing the requirements set forth in Sections 2.1, 3.1, and 3.5 through 3.10 of CDPH/EHLB/Standard Method V1.1, shall be submitted. The emission levels of all individual VOCs present, as well as formaldehyde emission present shall be reported. Where recognition under Table 806.6(2) of the IgCC is sought for insulation manufactured

<sup>1</sup> Available from the California Indoor Air Quality Program web site at <http://www.cal-iaq.org/vocs/standard-method-for-voc-emissions-testing-and-evaluation>

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without formaldehyde, only the individual VOCs present are required to be reported.

Where recognition is sought under CALGreen (Sections 4.504.4, 5.504.4.6, A4.504.2, A4.504.3, A5.504.4.7, A5.504.4.7.1, A5.504.4.9.1); ICC 700 (Sections 901.6, 901.7, 901.8, 901.9, 901.10, 901.11); ASHRAE Standard 189.1 (Informative Appendix G); or ANSI/GBI 01-2010 (Section 12.2.1), the results of testing in accordance with GGTM.066 may be submitted.

### 3.0 QUALITY CONTROL

#### 3.1 Required Elements of the Quality System

**Documentation:** Quality system documentation shall be submitted that meets the following requirements:

**3.1.1** The documentation shall be signed and dated by an authorized representative of the manufacturer.

**3.1.2** The documentation shall clearly state the facility name of the manufacturing location, the street address and telephone number, and the name of the contact person at the facility.

**3.1.3** There shall be provisions for the quality system documentation to be reviewed at least annually. A record of revisions shall be maintained.

**3.1.4** The documentation shall indicate how the recognized product is to be identified in the field. This information shall be consistent with the information in the "Identification" section of the VAR, and should include a copy of the product label or a description of what is included on the label. Product labeling shall include, at a minimum, the report holder's name, the VAR number (ICC-ES VAR-XXXX), and information required by the applicable environmental criteria.

**3.1.5** Based on the product identification, the quality system shall provide a means to trace finished product back to the production and quality control records at the location where the subject of the VAR was produced.

**3.1.6** The documentation shall describe the manufacturing process.

**3.1.7** The documentation shall include provisions for the documenting of product changes, evaluation of product changes and notification to the appropriate parties.

**3.1.8 Incoming Materials:** The documentation shall include procedures regarding inspections or tests that are conducted on incoming materials, or other means used to determine that the materials meet specifications (for example: mill test reports, certificates of analysis, certificates of compliance, etc.). If incoming material requiring a certificate at the time of receipt does not carry a certificate, then the documentation shall contain provisions for the material to be segregated until it has been appropriately tested or inspected, or the certificate is received.

**3.1.9 In-process Quality Control:** The documentation shall describe in-process quality control procedures, including how manufacturing processes are monitored to ensure that the product is consistently manufactured within the allowable tolerances.

**3.1.10 Final Inspection:** The documentation shall detail any final inspections and/or tests that are conducted before the product is labeled and shipped, to ensure that

the finished product complies with specifications and applicable design values.

**3.1.11 Nonconforming Materials:** The documentation shall specify how nonconforming materials—incoming materials, materials in production, and finished materials—are segregated from production until a decision is made as to their disposition.

**3.1.12** When products are manufactured at multiple locations, the report applicant shall submit quality system documentation for each of the manufacturing sites.

**3.1.13** When the product is manufactured by a party other than the report holder, a form provided by ICC-ES to the applicant to cover this circumstance shall be submitted.

**3.2** The following declarations shall be provided to ICC-ES in a signed and dated affidavit from the report holder:

**3.2.1** The ICC-ES name, mark, or report number will only be used on products that are in compliance with the VAR and the quality system documentation.

**3.2.2** The report holder will promptly investigate and respond to ICC-ES when apprised by ICC-ES of complaints concerning product performance.

**3.2.3** The report holder agrees to permit ICC-ES representatives to examine, at distribution points and the manufacturing plant, any product labeled as being in conformance with the VAR.

**3.2.4** ICC-ES will be notified in writing if there is a significant change in the product, manufacturing procedures or quality system documentation from what was recognized upon issuance of the VAR.

**3.3** Prior to issuance of a VAR, an initial on-site inspection of the manufacturing facility shall be conducted by an ICC-ES representative or a representative of an accredited inspection agency with the proper technical disciplines.

**3.4** At the time of renewal of a VAR, a third-party inspection of the manufacturing facility shall be conducted as a condition of renewal of the report. This inspection shall verify that no changes have occurred to the manufacturing process, raw materials or quality program as they relate to the VOC emissions of the finished product. Where the insulation is manufactured with formaldehyde the inspection shall verify that no changes have occurred related to the formaldehyde emissions.

### 4.0 VAR RECOGNITION

**4.1** The VAR shall identify the specific product, style or model and colors for which data was submitted.

**4.2** The VAR shall state the determined VOC emissions (and formaldehyde emissions, as applicable) and the test method used.

**4.3** Where the VAR subject is regulated by the *International Building Code*<sup>®</sup> (IBC) and/or *International Residential Code*<sup>®</sup> (IRC), and is the subject of a current ICC-ES evaluation report or listing, the following statement shall be included:

"See ICC-ES evaluation report ESR-XXX [or listing PMG-XXXX] for compliance with IBC and/or IRC code requirements."

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4.4 Where the VAR subject is regulated by the IBC and/or IRC but is not the subject of a current ICC-ES evaluation report or listing, the following statement shall be included:

“Evaluation of the VAR subject for compliance with the requirements of the IBC and/or IRC is outside the scope of this report and evidence of compliance must be submitted to the Authority Having Jurisdiction (AHJ) for approval.” ■