

ENVIRONMENTAL CRITERIA FOR DETERMINATION OF SOURCE OF RECOVERY, EXTRACTION, HARVEST AND MANUFACTURE FOR MATERIALS OR PRODUCTS

EC114

Effective date: March 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.

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1.0 INTRODUCTION

1.1 Purpose: This document provides a procedure for determination of the *source of manufacture* of a finished product and the *source of recovery*, *source of extraction* and *source of harvesting* of materials used in the manufacture of a finished product, and recognition of such in an ICC-ES Environmental Programs, Verification of Attributes Report (VAR).

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

1.3 Applicability: Provisions for the determination of source of manufacturing, recovery, extraction and harvesting of materials are contained in:

- 1.3.1 IgCC Section 505.2.5
- 1.3.2 CALGreen Section A5.405.1
- 1.3.3 ICC 700 Section 608.1
- 1.3.4 ASHRAE 189.1 Section 9.4.1.2
- 1.3.5 LEED Credit MR5 (LEED Homes Credit MR2.2)
- 1.3.6 ANSI/GBI 01 Section 10.1.3, 10.1.4, 10.2.4 and 10.2.5.

Reports issued under this criteria address source location(s) and may assist in evaluation for compliance with IgCC Section 505.2.5 requirements for material/product sourcing as well as similar requirements in the other documents referenced in the criteria. However, it must be noted that the evaluation for compliance as it relates to a specific building or site is outside the scope of this criteria or any reports issued under to this criteria.

1.4 Referenced Documents:

- 1.4.1 ASTM E2114-08, Standard Terminology for Sustainability Relative to the Performance of Buildings, ASTM International.
- 1.4.2 2012 *International Green Construction Code*™ (IgCC), International Code Council.
- 1.4.3 2010 *California Green Building Standards Code* (CALGreen), California Building Standards Commission.
- 1.4.4 2008 National Green Building Standard™ (ICC 700), National Association of Homebuilders.
- 1.4.5 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.
- 1.4.6 ANSI/GBI 01-2010, Green Building Assessment Protocol, Green Building Initiative, Inc.
- 1.4.7 LEED® 2009 for New Construction and Major Renovations, U.S. Green Building Council, Inc.
- 1.4.8 LEED® for Homes Rating System, Version 2008, U. S. Green Building Council, Inc.

1.4.9 LEED® 2009 for Schools New Construction and Major Renovations, U.S. Green Building Council, Inc.

1.4.10 LEED® 2009 for Core and Shell, U.S. Green Building Council, Inc.

1.4.11 LEED® 2009 for Commercial Interiors, U.S. Green Building Council, Inc.

1.5 Terms and Definitions: Unless otherwise provided for in this document, the definitions of terms shall be as set forth in ASTM E 2114.

1.5.1 Bio-Based Material: A commercial or industrial material or product, other than food or feed, that is composed of, or derived from, in whole or in significant part, biological products or renewable domestic agricultural materials, including plant, animal, and marine materials, or forestry materials. (IgCC Section 202).

1.5.2 Reuse: To divert a material, product, component, module, or a building from the waste stream in order to use it again.

1.5.3 Source of Extraction: The location where the materials, other than bio-based materials, that are used in the manufacturing of the finished product are obtained as raw material from the earth's natural resources.

1.5.4 Source of Harvesting: The location where the bio-based materials that are used in the manufacturing of the finished product are obtained as raw material from the earth's natural resources.

1.5.5 Source Location: The location where the manufacture, recovery, extraction of harvesting of materials or products occurs. This includes source of extraction, source of harvesting, source of recovery and source of manufacture.

1.5.6 Source of Recovery: The location where the materials that are used in the manufacturing of the finished product are collected and/or processed for reclamation, recycling or reuse.

1.5.7 Source of Manufacture: The location where the final assembly of materials into the finished product takes place or the location where the components are produced prior to combining onsite. As used in this EC, assembly does not include on-site installation of finished building components.

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 the raw materials used in the manufacture of the finished product. Additionally, all relevant specifications for the product must be provided along with 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 product as described in the submitted 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.

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- 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 for 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 Sourcing Documentation: The following shall be provided:

2.3.1 Detailed specifications of the finished product, including the identification of each material or component that comprises 1 percent by weight or greater of the finished product for which evaluation is requested.

2.3.2 The location where each of the constituent materials in the finished product is recovered, extracted or harvested, by GPS coordinates or by street address and ZIP or postal code. Where materials may be sourced from multiple locations, all locations must be identified and the average annual percentage sourced from each location must be provided. Where *bio-based material* may be sourced from a geographic area such as a field or forest, the perimeter of the area and the geometric center must be identified; the geometric center shall be considered the *source of harvest*. Where *non-bio-based material* may be sourced from a geographic area, the perimeter of the area and the geometric center must be identified; the geometric center shall be considered the *source of extraction*. When material is sourced non-uniformly across the geographic area, the calculation of the geometric center is permitted to be adjusted to account for this effect. When the documentation submitted consists of an average annualized percentage, the data shall be for the three most recent years from the date on which application is made.

2.3.3 The manufacturing location where the finished product is produced, by street address and ZIP or postal code. When the product may be manufactured at multiple locations, there must be a correlation of the *source of recovery*, *source of extraction* and/or *source of harvest* and percentage of constituent materials with each manufacturing location.

2.3.4 The weight of each material used in the manufacture of the finished product.

2.3.5 The percent (by total weight) that each material is in relation to the total weight of the finished product. Any material added as an accelerator, retarder and/or catalyst in the production process and contributing less than 1 percent of the total product weight may be excluded.

2.3.6 Optional: Information to document the mode of transportation used to transport the finished product from the source of manufacturing shall be provided, when the applicant desires to have this information included in the VAR.

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 quality system 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 labeling, the quality system shall provide a means to trace finished product back to the production and quality control records at the manufacturing facility.

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

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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 to the manufacturing process, raw materials or quality program as they relate to the sourcing of materials or manufacture, have occurred.

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 identify the constituent material(s) (by weight) in the finished product. For each constituent material comprising 1 percent by weight or greater of the finished product, the VAR shall state:

4.2.1 the percentage in the finished product, and

4.2.2 the *source of extraction, source of harvesting, or source of recovery*. Where the material may be sourced from multiple locations, the percentage by weight for each source shall be reported.

4.3 The VAR shall state the source of manufacture of the finished product. Where the product may be manufactured at multiple locations, the VAR shall correlate the source of recovery, source of extraction and/or source of harvest and percentage of constituent materials with each manufacturing location.

4.4 When the applicant has submitted documentation on the mode of transportation for the finished product as set forth in Section 2.3.6, this information shall be reported.

4.5 Where the VAR subject is regulated by the *International Building Code*[®] and/or the *International Residential Code*[®] but is the subject of a current ICC-ES evaluation report, the following statement shall be included:

“See ICC-ES evaluation report ESR-XXXX for compliance with IBC and/or IRC code requirements.”

4.6 Where the VAR subject is regulated by the IBC or the IRC but is not the subject of a current ICC-ES evaluation report, 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 evaluation report and evidence of compliance must be submitted by the permit applicant to the Authority Having Jurisdiction for approval.” ■

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APPENDIX A

The following examples are provided for illustrative purposes and are intended to provide an aid in determining relative source locations for constituent materials. They do not represent any actual manufacturer's product or material.

EXAMPLE 1 – Product with multiple sources for a constituent material (architectural glass)

As noted in Section 2.3.2, where materials may be sourced from multiple locations, identify all locations and describe annual percentage sourced from each location.

In this example a glass plant has raw materials sourced from some virgin feedstock, and some from recovered materials such as pre-consumer cullet. The sources of extraction include sand and soda ash quarries and the sources of recovery includes cullet waste from other factories.

The following table identifies the constituent materials in the finished product, the percentage (by weight) that each constituent material represents in the finished product, and the source(s). Sources are identified by type (recovery, extraction, or harvest), location, and annual percentage supplied relative to each constituent material. The table includes data for cullet to illustrate sourcing of a single constituent material from multiple sources.

MANUFACTURING FACILITY LOCATION	CONSTITUENT MATERIALS	% OF PRODUCT (BY WEIGHT)	SOURCE #1 LOCATION	SOURCE #1 TYPE	SOURCE #1 ANNUAL %	SOURCE #2 LOCATION	SOURCE #2 TYPE	SOURCE #2 ANNUAL %
XXX Glass Manufacturing, 1234 W. State St City, State. Zip	Silica sand	60.6%						
	Soda ash	13%						
	Limestone	8.4%						
	Dolomite	4%						
	Cullet from consumer industry	5%	123 1 st St; City, State. Zip	Recovery	60%	456 Main; City, State. Zip	Recovery	40%
	Cullet from in-process waste	8%						
	Alumina	1%						

EXAMPLE 2 – Product with multiple manufacturing locations (ready-mix concrete)

When the product may be manufactured at multiple locations, it is necessary to correlate the source(s) of recovery, extraction and/or harvest and percentage of constituent materials with each manufacturing location. In this example a concrete plant ("Batch plants") is the manufacturing facility that uses significant amounts of materials where the source of extraction is located in relatively close proximity to the plant. Although one of the main ingredients, Portland cement may be produced at some distance from the concrete plant, much of the constituent materials of concrete can be sourced locally.

The following tables identifies the constituent materials in the finished product produced at each individual manufacturing facility, the percentage (by weight) that each constituent material represents in the finished product, and the source(s). Sources are identified by type (recovery, extraction, or harvest), location, and annual percentage supplied relative to each constituent material. The tables include data for coarse aggregate at each manufacturing facility to demonstrate sourcing of a finished product from multiple manufacturing locations.

Note that the reporting of sourcing information for each manufacturing facility can be of assistance in project-specific evaluation for compliance with Section 505.2.5 of the IgCC. For project-specific evaluation with IgCC, products produced from each manufacturing location will be reviewed and calculated as distinct products. Thus, it may be that concrete supplied from one batch plant complies but another does not based upon the relative location of the batch plants and the building site.

MANUFACTURING FACILITY #1 LOCATION	CONSTITUENT MATERIALS	% OF PRODUCT (BY WEIGHT)	SOURCE #1 LOCATION	SOURCE #1 TYPE	SOURCE #1 ANNUAL %	SOURCE #2 LOCATION	SOURCE #2 TYPE	SOURCE #2 ANNUAL %
XXX Concrete Co, 1234 White St City, State. Zip	Water ¹							
	Cement	14.9						
	Fly ash	3.5						
	Coarse aggregates	49.8	123 1 st St; City, State. Zip	Extraction	75%	456 Main; City, State. Zip	Recovery	25%
	Fine aggregates	31.8						

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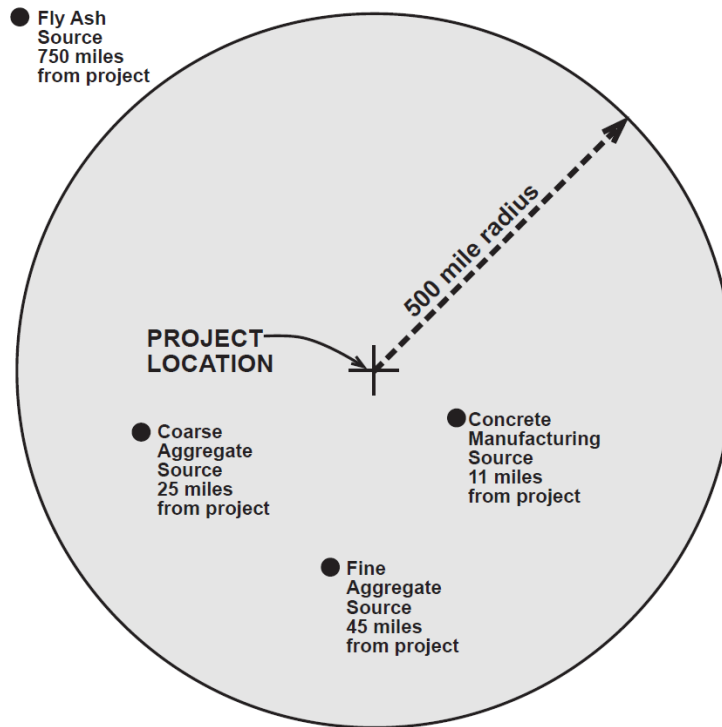
APPENDIX B

The following examples are provided for illustrative purposes and are intended to provide information to aid in the use of the information provided in a VAR for the purpose of the evaluation of material sourcing requirements to determine compliance with Section 505.2.5 of the IgCC for a given building and site. They do not represent any actual manufacturer's product or material.

The first step is to locate the project site and define the allowable distance from the site. In this example, the allowable distance is 500 miles. The manufacture of the product must be within the 500 mile radius. If it is, then the portion (as a percent by weight) of the product that is recovered, harvested, or extracted within the same 500 mile radius is considered compliant.

Diagram 1 shows compliance.

Diagram 2 shows non-compliance because the project site is further than 500 miles from the source of manufacture.



manufacturing	n/a	11 miles	complies
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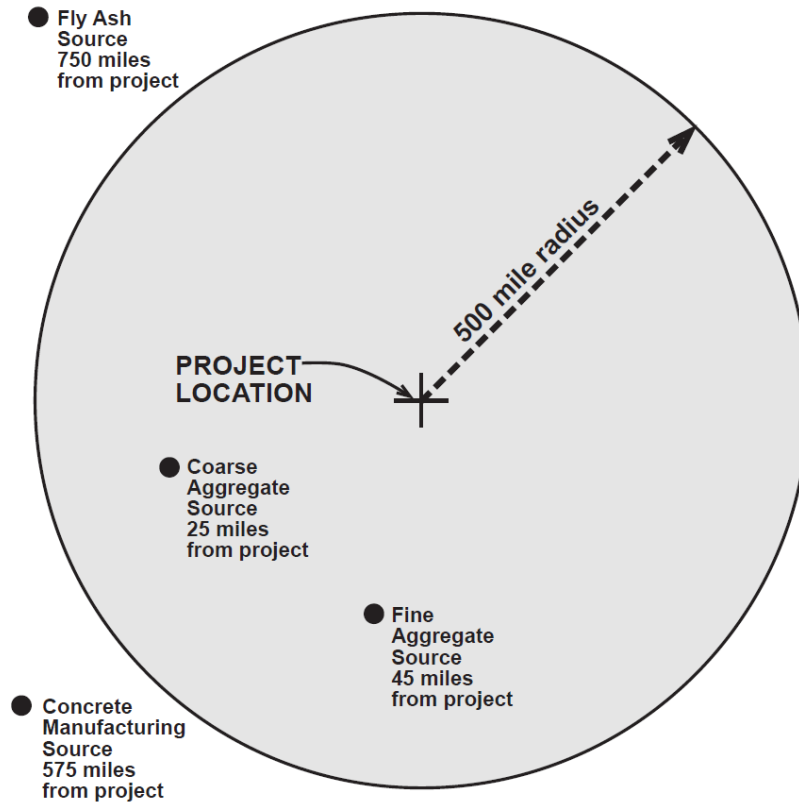
● Portland Cement Source
950 miles from project

water	n/a	n/a	0%
cement	14.9%	950 miles	0%
fly ash	3.5%	750	0%
coarse aggregate	49.8%	25	49.8%
fine aggregate	31.8%	45	31.8%

Total % product complying with 500 mile radius 81.6%

DIAGRAM 1

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manufacturing	n/a	575	does not comply
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● Portland Cement Source
950 miles
from project

water	n/a	n/a	0%
cement	14.9%	950 miles	0%
fly ash	3.5%	750	0%
coarse aggregate	49.8%	25	49.8%
fine aggregate	31.8%	45	31.8%

Total % product complying with 500 mile radius **0.0%**

DIAGRAM 2