



2011-2012 ANSI Consensus Body Review of
CRRC-1 Standard

Comments and Responses from the First Public Review Period (June 10 – August 9, 2011)

Cool Roof Rating Council

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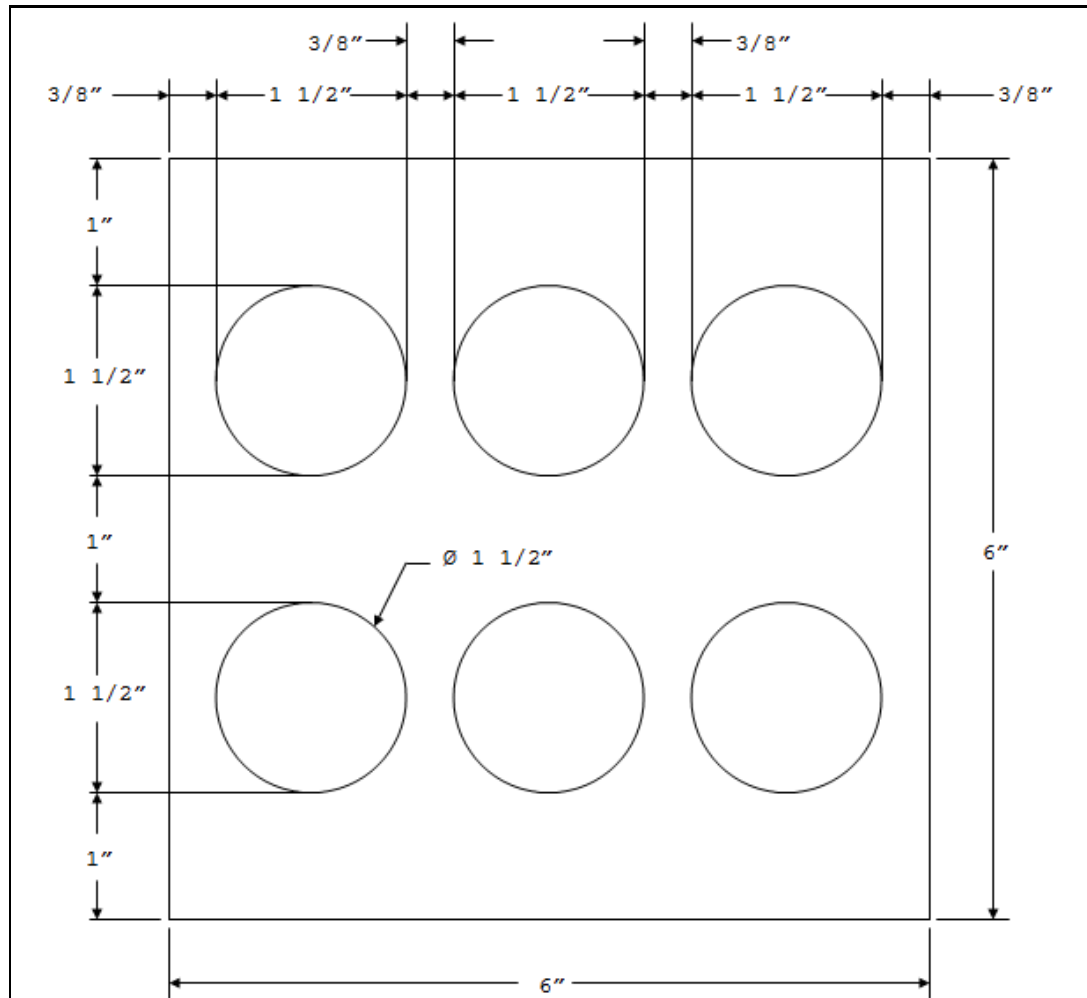
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C1-11-A

Section	S.1.5 and S.1.6
Proposed Text	<p>PART 1: <i>(Modify the following definition as shown below)</i></p> <p>Accredited Independent Testing Laboratory (AITL) - A testing laboratory that is accredited for compliance with ANSI ISO/IEC Standard 17025 to test Roofing Products and is completely independent from any roofing product manufacturer or roofing product seller. Accredited shall be defined as achieving third-party evaluation accreditation by an organization accredited to ISO 17011.</p> <p>PART 2: <i>(Add the following reference standards)</i></p> <p><u>ISO</u> <u>The International Organization for Standardization</u> <u>1, ch. de la Voie-Creuse, Case Postale 56</u> <u>CH-1211 Geneva 20, Switzerland</u></p> <p><u>ISO/IEC Standard 17025-2005, General requirements for the competence of testing and calibration laboratories</u></p> <p><u>ISO/IEC Standard 17011-2004, Conformity assessment -- General requirements for accreditation bodies accrediting conformity assessment bodies</u></p>
Substantiating Statements	<p>This proposal requests that a new reference standard category be created with two standards listed under that category. Basis for need can be found in Section S.1.5 (Glossary of Terms) where under the definition of "Accredited Independent Testing Laboratory" these standards are referenced, but in Section S.1.6 they are not. This proposal attempts to rectify that discrepancy.</p> <p>The proposal also requests that the letters "ANSI/" be deleted without substitution from the definition of "Accredited Independent Testing Laboratory". While the document is sold through ANSI, the document is an ISO publication.</p>
Attachments	None
Cost Impact	None known
Consensus Committee Response	Accept

C1-11-B

Section	S.1.5, S.2.2, and S.3.2
Proposed Text	<p>S.2.2 Solar Reflectance Tests <i>(Items (A) through (C), no changes proposed)</i></p> <p><u>(D) Tile Products. Tile products shall be tested using CRRC-1 Test Method 1 or the Template Method.</u></p> <ol style="list-style-type: none">1.) <u>For CRRC-1 Test Method 1, six measurements shall be taken randomly on each of nine tiles selected.</u>2.) <u>For the Template Method, the measurements shall be taken in the locations indicated by the template, in accordance with Figure S.2.2(D). Position the template to include the maximum color variegation on the sample.</u> <p><u>For either method, additional measurements shall be taken until the standard error of all the measurements is equal to or less than 0.02. To take additional measurements, randomly take a 7th measurement per tile and re-check the standard error. Continue taking measurements in this manner as necessary in order to achieve the standard error limitation, or until the AITL determines that the standard error limitation can not be achieved in which case the test sample will have been deemed to have not passed. The AITL performing the measurements shall mark the arrangement of the tiles and record the locations of the measurements in the report developed in accordance with Section S.2.7.</u></p> <p><u>When samples are tested for both initial and aged results, the measurement locations shall be the same for both tests.</u></p> <p style="text-align: center;">Figure S.2.2 (D) Template Design</p>



PART 2:

S.3.2 Standard Roofing Product Specimen





(Add new language to S.3.2(B), No change to S.3.2 (A))

2. Tile Products: Tile products, both mono-color and variegated, shall be rated using nine individual tiles. Tiles shall be flat, unless only profiled products are available. Flat and S-shape tiles may be cut down by the tile manufacturer to a smaller size of 6 inches by 6 inches, allowing any unreadable areas to be removed, as long as a representative sample remains to be tested. All other curved tiles must be sent as full, uncut tiles. For tile blend assemblies that are made up of two or more colors, each color must be tested and rated as an individual product. Each color will appear in the CRRC database as a unique product. Tile blend ratings will be determined by calculating a weighted average of the colors in each particular blend.

PART 3:

S.1.5 Glossary of Terms

(Add the following definition)

<p>Substantiating Statements</p>	<p><u>Standard Error – Standard deviation divided by the square root of the sample size.</u></p> <p>This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.</p> <p>Since the development of the CRRC-1 Standard the Cool Roof Rating Council, and the CRRC Technical Committee, had the opportunity to execute further research and development to address more roofing products. The tests methods cited in this proposal were some of the successes of that R&D. In this case the focus by CRRC Technical Committee was how to accurately and reliably test roof tile samples which had both multiple colors and surfaces which were not considered flat. Two methods were found to achieve the goals, that of the CRRC-1 Method and the Template Method.</p> <p>Attached are four (4) files containing information to support the proposal. This information represents the technical information used to assess and recommend to the CRRC that the additions and modifications to the CRRC Product Rating Program.</p>
<p>Attachments</p>	<p>Power point file entitled: “Exhibit 3-CRRC Technical Draft Template Method Final”</p> <p></p> <p>Exhibit 3 - CRRC Technical Draft Temp</p> <p>Excel Spreadsheet file entitled: “Exhibit 3 - Standard Error Data for Template Method”</p> <p></p> <p>Exhibit 3 - Standard Error Data for Temple</p> <p>Power point file entitled: “Exhibit 5 – CRRC Standard Error”</p> <p></p> <p>Exhibit 5 - CRRC Standard Error.pdf</p> <p>Word file entitled: “Exhibit 6 – Interim Tile TM, E1918 Language Changes”</p> <p></p> <p>Exhibit 6 - Interim Tile TM E1918 Language</p>
<p>Cost Impact</p>	<p>The proposal will open up opportunities for the roof tile industry as a result of the CRRC-1 Standard having test methods which can be considered reasonably reliable and verifiable.</p>
<p>Consensus Committee Response</p>	<p>Disapprove. The Consensus Body is concerned about the instructions being unclear, including the procedure for taking initial measurements and seventh measurement, and the procedure for products that do not pass the 0.02 standard error threshold. The Consensus Body asks to the proposer to resubmit clearer language during the Second Public Comment Period.</p>

C1-11-C

Section	S.2.5, S.3.2, and S.1.6
Proposed Text	<p>PART 1 <i>(Modify as shown below)</i></p> <p>S.2.5 Fluid Applied Roofing Products Coating Roof Product Thickness Tests (A) Fluid Applied Roofing Products Coating Thickness Tests Fluid applied roofing products Coating Thickness tests shall be conducted based upon ASTM D1669. (B) A thickness measurement shall be taken at five evenly spaced points on each of the nine product specimens. The average of the five measurements shall be used to determine the thickness of the coating on each specimen. The average thickness of the measured coating for a given specimen shall be within 20% of the manufacturer’s recommended minimum thickness. A specimen which is not within this range shall not be used for ratings.</p> <p><u>(B) Single-Ply Thickness Tests</u> <u>All single-ply roofing products shall be tested for overall thickness using ASTM D751. A thickness measurement shall be taken at five evenly spaced points on each of the nine product samples. The average of the five measurements shall be used to determine the overall thickness of each sample. The average thickness for a given sample shall be within 20% of the manufacturer’s stated thickness. A sample which is not within this range shall not be used for CRRC ratings.</u></p> <p>PART 2 <i>(Add the following new section. Re-number as necessary.)</i></p> <p>S.3.2 Standard Roofing Product Specimen <i>(No changes proposed to S.3.2(A))</i> (B) Specimen Preparation: Each specimen shall be at least 155 square centimeters (24 square inches) in size and shall be identified with the manufacturer’s name, address, product name and/or model number, batch number and individual specimen number within each batch. Labels shall be designed to be durable for a period of four (4) years, during which specimens will be exposed to the environment.</p> <p><u>(2) Single-Ply Products: Products: Each single-ply product submitted for testing shall have a declaration for the overall thickness of the product by the manufacturer. The thickness of single-ply products shall be verified by an AITL in accordance with ASTM D751 and the procedures set forth in Section S.2.5. The thickness must be within 20% of the manufacturer’s stated thickness. In order for a single-ply product to qualify for a Compound Product Rating for solar reflectance and thermal emittance the product with the thinnest overall thickness must be tested. For multiple single-ply products with the same surface formulation, but varying backing thicknesses, the solar reflectance and thermal emittance ratings for the thinnest of these products shall be applied to the other thicker products.</u></p>

	<p>PART 3 <i>(Add new reference)</i></p> <p>S.1.6 References ASTM ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org</p> <p><u>ASTM D751 (2006), Standard Test Methods for Coated Fabrics, American Society of Testing and Materials, West Conshohocken, PA, USA.</u></p>
<p>Substantiating Statements</p>	<p>This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.</p> <p>The purpose of this proposal is to recognize and address roofing products which have varying degrees of thicknesses. In this case single-ply roofing products are not produced in exact uniform thickness, as a result a test method has been established to address how and when samples are accepted for solar reflectance and thermal emittance testing. The thickness testing is straight forward in its intent and goals for acceptance or rejection of samples.</p> <p>The proposed provisions also include requirements for when similar products, such as multiple single-ply products with the same formulation but different backings, and for compound rated products.</p> <p>Further, an ASTM test method is being proposed for incorporation into the provisions and Section S.1.6 (References) which will assist in establishing consistency of the test procedures.</p>
<p>Attachments</p>	<p>None</p>
<p>Cost Impact</p>	<p>The additional cost is anticipated as a result of additional testing required to verify the roofing product thickness.</p>
<p>Consensus Committee Response</p>	<p>Disapprove. The Consensus Body determined that single ply products are factory manufactured and do not require thickness measurements.</p>

C1-11-D

Section	S.3.2, S.3.4, and S.3.5
Proposed Text	<p>PART 1 <i>(Modify as follows)</i> S.3.2 Standard Roofing Product Specimen (D) 1. <i>Initial</i> Rated Radiative Properties reported shall be no greater than <u>determined by</u> the average of the initial test results of the specimens from Batches A and B.</p> <p>PART 2 <i>(Modify as follows)</i> S.3.4 Custom Colors (C) 1. <i>Initial</i> Rated Radiative Properties reported shall be no greater than <u>determined by</u> the average of the initial test results of the specimens provided.</p> <p>PART 3 <i>(Modify as follows)</i> S.3.5 Variegated Products (C) 1. <i>Initial</i> Rated Radiative Properties reported on the Product Rating Application shall be no greater than <u>determined by</u> the arithmetic average of the average Radiative Property values for each of the two specimens, one specimen from batch A and one specimen from batch B, determined in accordance with CRRC-1 Test Method #1. In the event that the two specimens yield Radiative Property values that differ by more than 0.05 both specimens shall be deemed to be non-compliant with the requirements stated in the second paragraph of this Section S.3. The Seller or OM shall then be required to prepare three additional specimens of sufficiently larger dimensions to ensure that the difference of the Radiative Property values between each of the two new measured specimens is equal to or less than 0.05.</p>
Substantiating Statements	<p>This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.</p> <p>The proposal intends to modify the reporting requirements of the sections concerning “properties reporting”. The focus is to remove the option for manufacturers to be allowed to under-report values, and instead require that actual reporting of values be used. It was found to be necessary in order to, in part, the potential gaming of report values and to prevent if not remove a litigious aspect to the CRRC-1 Standard.</p>
Attachments	None
Cost Impact	None known. The roof product manufactures must already perform this arithmetic assessment.
Consensus Committee Response	Accept

C1-11-E

Section	S.1.6
Proposed Text	ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org ASHRAE handbook—Fundamentals, 2005. ANSI/ASHRAE Standard 169-2006 – Weather Data for Building Design Standards, 2006. ASHRAE Terminology of Heating, Ventilation, Air Conditioning, & Refrigeration, 1991.
Substantiating Statements	The proposal recommends that the reference to the ASHRAE Handbook – Fundamentals be deleted without substitution as the document is not referenced in the CRRC-1 Standard. Since there is no reference there is no need to list the ASHRAE Handbook – Fundamentals in Section S.1.6.
Attachments	None
Cost Impact	None
Consensus Committee Response	Accept

C1-11-F

Section	S.1.6
Proposed Text	<p><i>(Modify dates of standards as shown below)</i></p> <p>ASTM ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org</p> <p>ASTM C1549 -04 -09, Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.</p> <p>ASTM D1730 -03(2003) -09 (2003), Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.</p> <p>ASTM D2244-07 -11, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color and Coordinates.</p>
Substantiating Statements	This proposal is recommending that various ASTM standards be updated as part of this CRRC-1 Standard review process.
Attachments	None
Cost Impact	None known
Consensus Committee Response	Disapprove. Due to staff error, the Consensus Body did not receive the Standards in question before meeting to review comments. The Consensus Body asks the proposer to resubmit the comment in the Second Public Comment Period.

C1-11-G


Section	S.3.2
Proposed Text	<p><i>(Modify by deleting the following language as shown below. No changes proposed to the remainder of Section S.3.2.)</i></p> <p>S.3.2 Standard Roofing Product Specimen</p> <p>(B) Specimen Preparation: Each specimen shall be at least 155 square centimeters (24 square inches) in size and shall be identified with the manufacturer’s name, address, product name and/or model number, batch number and individual specimen number within each batch. Labels shall be designed to be durable for a period of four (4) years, during which specimens will be exposed to the environment.</p> <p><u>1. Profiled Metal Roofing Products:</u> Profiled metal roofing products shall be rated using flat specimens of the same color and material. Ratings for these specimens may be applied to standing seam, agricultural panel, and modular/metal shingle profile types. Exceptions: All other profile types of any solar reflectance shall be rated using profiled test specimens and the solar reflectance shall be measured using ASTM E1918.</p>
Substantiating Statements	<p>This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.</p> <p>The Cool Roof Rating Council (CRRC) had conducted studies that attempted to find out if E1918 could be used to effectively measure profiled products. Following this investigation, in May of 2011 the CRRC Technical Committee recommended removing “interim” from the tile test method. Following the presentation of that work the CRRC Board discussed this and agreed to make the tile test method “final” in the CRRC-1 Product Rating Program (and correspondingly the ANSI standard). During this discussion it was noted that if the Board wanted to make the tile test method “final”, in effect removing the consideration of profile for tile products, then they should be consistent and remove the profile requirement for metal profiled products. As a result of that assessment, the CRRC Board approved that the tile test method would be accepted as final and certain metal profiled products would no longer be required to use E1918 for their reflectance ratings.</p>
Attachments	<p>Word file entitled: “Exhibit 2 – E1918 Study Proposal and Board Decision”</p> <div style="text-align: center;">  <p>Exhibit 2 - E1918 Study Proposal and B</p> </div> <p>Word file entitled: “Exhibit 6 – Interim Tile TM, E1918 Language Changes”</p>



Exhibit 6 - Interim
Tile TM E1918 Language

Cost Impact	Estimate none or negligible cost in this case.
Consensus Committee Response	Accept

C1-11-H

Section	S.3.2
Proposed Text	<p><i>(Add the following provisions. Renumber as necessary.)</i></p> <p>S.3.2 Standard Roofing Product Specimen</p> <p><i>(No change proposed to S.3.2 (A))</i></p> <p>(B) Specimen Preparation: Each specimen shall be at least 155 square centimeters (24 square inches) in size and shall be identified with the manufacturer’s name, address, product name and/or model number, batch number and individual specimen number within each batch. Labels shall be designed to be durable for a period of four (4) years, during which specimens will be exposed to the environment.</p> <p><u>X. Profiled Metal Roofing Products: Profiled metal roofing products shall be rated using flat samples of the same color and material. Ratings for these samples are permitted to be applied to profiled products when it can be demonstrated that no flat samples are available.</u></p> <p><u>XX. Shingle Products: If a manufacturer or OM has multiple shingle products with the same exposed color blend granule formulation, the solar reflectance and thermal emittance ratings for the tested product shall be permitted to be applied to these other products. The manufacturer or OM submitting the shingle product for certification must declare as part of their application any differences, which shall include varying granule distributions, the non-exposed shingle system components, or design features.</u></p> <p><u>XXX. Modified Bitumen Products: If a manufacturer or OM has modified bitumen products whose granules have the same color blend formulation, size, solar reflectance, and thermal emittance, and/or whose factory applied coatings have the same coverage rate and formulation, the solar reflectance and thermal emittance ratings for the tested product shall be permitted to be applied to these other products. The manufacturer or OM submitting the modified bitumen product for certification must declare as part of their application any differences in the non-exposed system components or design features.</u></p> <p><u>XXXX. Polymer Shaped Products: All polymer slate, polymer shake, and polymer tile shaped products shall be initially measured by the AITL to determine the lowest reflectance and the shape with the lowest reflectance to be used for reporting values. For aged testing, the lowest reflectance profiled product will be sent to weather at the Test Farm Sites. The manufacturer or OM submitting the polymer shaped product for certification shall declare as part of their application any differences, such as shape or design features.</u></p>
Substantiating Statements	This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.
Attachments	None

Cost Impact	None known
Consensus Committee Response	Accept in Principle. Since the Consensus Body accepted language changes for Profiled Metal Roofing Products in Comment C1-11-G, the Consensus Body voted to accept in principle this comment with the modification of removing the section labeled "X" without any substitutions. The Consensus Body voted to retain the other three proposed sections.

C1-11-I

Section	S.3.3
Proposed Text	<p>S.3.3 Factory Colored Products <i>(No changes proposed to charging paragraph)</i></p> <p>(A) Specimen Selection:</p> <ol style="list-style-type: none"> 1. Standard Color or Color Family Group: Nine specimens shall be randomly selected from routine production and sent to an Accredited Independent Testing Laboratory for testing. These specimens shall be grouped into three sets: a) three specimens from one Batch, b) three specimens from a second Batch, and c) another set of three specimens for which each of the two Batches must be represented. This results in a total of four specimens from one batch and five from the other. 2. <u>Color Family Additional Element: For each Color Family Additional Element to be added to an existing Color Family Group six (6) samples shall be randomly selected and sent to an Accredited Independent Testing Laboratory for radiative properties testing. These specimens shall be grouped into two sets: a) three specimens from one Batch, b) three specimens from a second Batch.</u> <p>(B) <i>(No proposed changes)</i> (C) <i>(No proposed changes)</i> (D) Radiative Properties Reporting: The rated radiative properties of the product specimens shall be reported according to the following provisions:</p> <ol style="list-style-type: none"> 1. Initial Rated Radiative Properties reported shall be determined by the average of the tests conducted on specimens from Batches A and B. 2. Aged Rated Radiative Properties reported shall be no greater than the arithmetic average of the aged test results of each of the nine product specimens that undergo aging exposure. 3. In the event that a specimen is uncharacteristically damaged during weathering exposure, the specimen shall be removed from the calculation of the Aged Radiative Properties. As a result of such an occurrence, the Aged Rated Radiative Properties reported shall be no higher than the arithmetic average of the averaged results from each Test Farm Site. Up to two product specimens per test farm site shall be permitted to be discarded if uncharacteristically damaged. Should all three specimens from one test farm site be uncharacteristically damaged, the Seller or Other Manufacturer shall re-test their products. 4. <u>Color family additional elements are not subject to Aged Radiative Properties testing. The Aged Rated Radiative Properties reported on the Color Family Additional Element and Results Report shall be identical to that which is reported for the Representative Element of the Color Family Group; either the initial Color Family Group default value or the actual aged rated value of the Representative Element, whichever is lower.</u>
Substantiating Statements	<p>This proposal represents a proposed extraction of a test method from the Cool Roof Rating Council – Product Rating Program, with modifications to the format for integration into the CRRC-1 Standard.</p>


	<p>This proposal is recommending that the current “color family additional element” provisions be transferred to the CRRC-1 Standard. The primary focus of which is to recognize that additional testing is not necessary is certain restrictions are adhered to. In this case the acceptance of the Hunter values, in accordance with ASTM D2244.</p> <p>The remaining provisions of Section S.3.3 are retained unchanged as the provisions are effectively identical in the CRRC Product Rating Program for both the color family groups and representative elements and the color family additional elements. Therefore no changes are recommended.</p>
Attachments	None
Cost Impact	The cost for additional elements testing and reporting may be less as aged testing is not required.
Consensus Committee Response	Accept in Principle. The Consensus Body made a motion to accept in principle with modifications made to S.3.3 (A) 2) of the term “samples” to be deleted and substituted with the word “specimens”.

C1-11-J

Section	S.3.5
Proposed Text	<p>S.3.5 Variegated Products</p> <p>Variegated products shall either be tested using ASTM E1918 or CRRC-1 Test Method #1. When products which are tested in accordance with CRRC-1 Test Method #1 shall adhere to the following provisions must be followed:</p> <p>(A) Specimen Selection: Specimens of Variegated Products with non-continuous (<u>E.g., granules, particles, etc.</u>) top coatings <u>surfaces</u> that are tested under CRRC-1 Test Method #1 shall be randomly selected from routine production and sent to an AITL for testing. These specimens shall be grouped into three sets:</p> <ol style="list-style-type: none"> 1. One (1) specimen from Batch A comprised of at least two shingles <u>from Batch A</u> (for shingle products); 2. One (1) specimen from Batch B comprised of at least two shingles <u>from Batch B</u> (for shingle products); and 3. One (1) specimen for which each of the two Batches shall be represented, including at least one shingle from <u>Batch A and one shingle from Batch B</u> (for shingle products) each of the two Batches for shingle products <p><i>Advisory note: specimens may be comprised of multiple pieces. Top coatings <u>surfaces</u> may be particles, or other methods of obtaining <u>materials creating</u> a variegated surface.</i></p> <p>(B) Specimen Preparation: Three specimens shall be prepared in accordance with this section. <i>Advisory note: the manufacturer may opt to work with an AITL to prepare specimens in accordance with the following provisions.</i></p> <ol style="list-style-type: none"> 1. The Seller or OM is responsible for assuring that specimens are sufficiently large and properly constructed so as to yield Radiative Property test results that are representative of the expected average Radiative Properties of a complete roof surface of such product that has been installed in accordance with published manufacturer instructions. Shingle specimens shall be constructed with as many shingles are necessary to achieve this. In no event, however, shall the specimens fail to meet the provisions set forth in Section S.3.5(B)(2) as follows: 2. Specimens to be tested under CRRC-1 Test Method #1 shall have a minimum dimension of 25 cm by 91 cm (10 inches by 36 inches) of exposure surface. 3. Shingle specimens shall include at least two courses (two full courses of exposure surface in height). Specimens, including individual pieces that comprise the specimen, shall be labeled with the necessary information for identification by batch and specimen, such that <u>The labels are must be</u> designed to be durable for a period of four (4) years, during which <u>time</u> specimens will be exposed to the environment. <p>The Seller of OM shall be responsible for ensuring that specimens of Variegated Roofing Products that require ASTM E1918 testing are prepared on the appropriate substrate(s) in accordance with the recommendations of the manufacturer.</p>

Substantiating Statements	The editorial changes suggested are intended to provide clearer instruction to the reader.
Attachments	None
Cost Impact	None
Consensus Committee Response	Accept

C1-11-K

Section	S.4.6
Proposed Text	<u>The data required for a Precision and Bias statement are not presently available. A project to plan and carry out a Round Robin to obtain the data for a precision statement is underway. The precision statement will be provided in a timely manner. A statement of bias will be included if standard reference materials become available.</u>
Substantiating Statements	A test method must be substantiated with an analysis of experimental uncertainty or a precision statement. A statement about bias depends on the availability of standard reference values.
Attachments	C-11-J Attachment  C-11-J Attachment.doc
Cost Impact	None
Consensus Committee Response	Accept in Principle. The Consensus Body recommends that the submitter contact the CRRC Technical Committee to work on a precision and bias study for CRRC-1 Test Method #1. The Consensus Body requests that the proposer submit a more refined proposal in the Second Public Comment Period.