



ENERGY STAR[®] Program Requirements Product Specification for Roof Products

Test Method: Maintenance of Solar Reflectance

Rev. March 1, 2015

1) OVERVIEW

The following test method shall be used for determining product compliance with maintenance of solar reflectance requirements in the ENERGY STAR Product Specification for Roof Products.

2) APPLICABILITY

This test protocol is applicable for evaluation to the ENERGY STAR Roof Products Eligibility Criteria.

3) DEFINITIONS

Unless otherwise specified, all terms used in this document are consistent with the definitions contained in the ENERGY STAR Product Specification for Roof Products.

4) TEST SETUP

Test setup and instrumentation shall be in accordance with applicable test standards, as referenced herein, unless otherwise noted in this document. In the event of conflicting requirements, this test procedure shall take precedence.

5) PREPARATION OF PRODUCT UNDER TEST

The test surface of each sample shall not be washed, cleaned, or wiped in any fashion. Loose dirt, embedded dirt, environmental stains, mold, mildew, and any other material that rests on – or has become incorporated into – the surface of the material shall not be altered.

6) TEST METHODS

Note: As proposed in the Version 3.0 specification, as of March 1, 2015, all products must be third-party certified to remain ENERGY STAR qualified. Products currently on the qualified product list that were not tested on a weathering farm will need to be retested and third-party certified by an EPA-recognized Certification Body to remain qualified. However, qualified products that have been tested on weathering farms, but not third-party certified, may be able to retain their qualification if tested by an EPA-recognized laboratory and test data is accepted by an EPA-recognized CB.

As of March 1, 2015, all roof products must have been tested on a weathering farm using one of the Standards referenced below to remain qualified. As such, in-field testing options and references to ASTM test Standards 1918 and 903 have been removed from this ENERGY STAR Test Method. EPA-approved laboratories and CBs will be required to use this version of the Test Method starting March 1, 2015 to test and evaluate products under the new Version 3.0, which will also become effective March 1, 2015.

Applicable Test Standards

Test setup and instrumentation shall be in accordance with applicable test standards, as referenced herein:

- a) ASTM G 7M-11: *Standard Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials*
- b) ASTM E 903-96: *Standard Test Method for Solar Absorptance, Reflectance, and Transmission of Materials Using Integrating Spheres, or*
- c) ASTM C 1549-09: *Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer*

Test Procedure

- a) Expose panels outdoors on commercial or private weathering farms that are accredited to ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*.
- b) Prepare panels such that the surface to receive solar radiation goes over the intended substrate¹.

Note: EPA has updated the ASTM G 7 and ISO/IEC 17025 Standard references above to reflect the latest 2011 and 2005 versions, respectively. EPA is also considering adding one or more weathering farm location requirements consistent with the Cool Roof Rating Council's hot/humid, cold/temperate, and/or hot/dry defined climates as per the Product Rating Program, CRRC-1. This will allow end users to fairly compare products based on climate conditions and avoid testing in zones that produce more favorable results but are not representative of true performance. However, while considering this approach EPA also understands that there are costs associated with testing products in multiple climate zone locations. Stakeholders are encouraged to comment on the inclusion of climate zones and if supportive of this approach, make suggestions regarding appropriate and representative climate zones for consideration.

¹ For example, if a coating is intended for BUR, the specimen set needs to be prepared using BUR. If the coating is to be used over Modified Bitumen, a specimen set needs to be prepared using Modified Bitumen.

- c) At least three (3) panels with the identical formulation as those that were tested for initial solar reflectance shall be exposed for a minimum of three continuous years in accordance with ASTM G 7M-11.

Note: A clarification has been made above that testing panels shall be exposed for a *minimum* of three *continuous* years in accordance with ASTM G 7M-11.

If EPA decides to take the approach of requiring climate zones, the number of panels to be tested will be changed, accordingly. For example, CRRC requires 3 samples to be tested per each of the 3 required climate zones for aged certification. In this example, EPA would require a total of 9 samples to be tested for ENERGY STAR qualification. Stakeholders are encouraged to comment on sample size.

- d) Each exposure panel shall be at least 24 square inches (155 square centimeters) in size, e.g. 4" x 6" or 3" x 8", and shall be mounted so that there is no run off from one panel to another.
- e) To further avoid runoff onto samples, where possible, the exposure panel shall be mounted near the top of the test rack.
- f) For low-slope roof products and coatings and for product that can be applied to either low-slope or steep-slope roofs, test samples shall be exposed at a slope of 2:12 or less (1/4:12 is recommended) and facing south.
- g) For steep-slope roof products and coatings, test samples shall be exposed at a slope between 2:12 and 12:12 (4:12 is recommended) and facing south.
- h) Make at least three (3) measurements of solar reflectance from different areas on each sample.