



Designation: D8012 – 18

Standard Practice for Reclamation of Scrap and Waste Asphalt Shingles to Produce Reclaimed Asphalt Shingles (RAS) for Use in Transportation Applications¹

This standard is issued under the fixed designation D8012; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers reclamation of asphalt shingles derived from manufacturing scrap and tear-off roofing. Reclaimed asphalt shingles (RAS) are used in roadway and other applications including asphalt paving materials and unbound materials such as granular fill.

1.2 Guidance is provided relating to material quality, material quality control, and also operator and facility qualifications.

1.3 *Units*—The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

NOTE 1—Sieve size is identified by its standard designation in Specification E11. The alternative designation given in parentheses is for information only and does not represent a different standard sieve size.

1.4 This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title means only that the document has been approved through the ASTM consensus process.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards*:²

C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates

D75/D75M Practice for Sampling Aggregates

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D2216 Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

2.2 *EPA Standard*:³

EPA 600-R-93-116 Polarized Light Microscopy: Method for the Determination of Asbestos in Bulk Building Materials

3. Terminology

3.1 *Definitions*:⁴

3.1.1 For definitions of common technical terms in this standard, refer to Terminology D653.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *asphalt shingle recycling facility (facility), n*—the physical plant (or plants) where manufacturing scrap asphalt shingles and/or tear-off or other post-consumer asphalt shingles are received, processed, tested, and stockpiled. This may include separate transfer locations.

3.2.2 *asphalt shingle recycling operator (operator), n*—the company or companies that receive manufacturing scrap asphalt shingles and/or tear-off or other post-consumer asphalt shingles and transform these materials into a finished RAS product.

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.14 on Geotechnics of Sustainable Construction.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Environmental Protection Agency (EPA), <https://semsub.epa.gov/work/HQ/177098.pdf>.

3.2.3 *reclaimed asphalt shingles (RAS), n*—the resulting product obtained from crushing, grinding, screening, and otherwise processing and recycling shingles derived from manufacturing scrap (that is, manufacturing waste), tear-off roofing (that is, post-consumer materials), or other shingle manufacturing waste and post-consumer asphalt shingles.

3.2.4 *unbound, adj*—descriptor for any granular material that has insufficient tensile strength to bear load and has low (less than 5 % by volume) shrinkage potential.

4. Significance and Use

4.1 Use of reclaimed asphalt shingles in asphalt production has become commonplace in transportation applications.

4.2 Use of reclaimed asphalt shingles in unbound applications, such as granular fill, alone or in mixtures with other materials, is developing.

4.3 The quality of RAS is critical for successful reuse of the shingles in asphalt production and other unbound applications. Various specifications are used regarding RAS.

4.4 This practice provides a common baseline framework for assuring material, operator, and facility quality for RAS production.

4.5 This practice provides sourcing, inspecting, sampling, testing, and stockpiling requirements for RAS operators.

4.6 This practice includes a certification form that is used for quality control and quality assurance for the facility, operations, and incoming material and outgoing product.

5. Material Quality Specifications

5.1 *General*—The material quality specifications are designed to ensure that the operator and the facility produces a RAS product that meets appropriate, generic quality specifications. Therefore, the limits contained within this ASTM standard may be considered as minimum quality standards. Individual asphalt material producers, RAS users, and local agencies may make their individual RAS specifications more stringent than what is provided herein to meet local requirements.

5.2 The operator and facility shall meet the following sourcing, inspecting, sampling, testing, and stockpiling requirements:

5.2.1 Only asphalt shingles are admissible. Other asphalt roofing products (for example, built up roofing, rolled roofing, sheet roofing, slate shingles, clay tile shingles) are not eligible.

5.2.2 Incidental amounts of other roofing materials (for example, wood, plastic, metal) are allowed in the incoming loads to the operator.

5.2.3 Each incoming load (defined as manufacturing scrap or tear-off roofing asphalt shingles from a single source, maximum 250 tons; if multiple truckloads are derived from the same source, they may be combined up to a maximum mass of 250 tons) shall be inspected and tested for the presence of asbestos and cleared for use by a certified inspector (conforming to relevant local, state/provincial/regional, and national/federal regulations) at the facility prior to any processing or co-mingling with other loads. If shingles can be identified as

being sourced from either manufacturer rejects produced without asbestos or tear-off roofing not containing asbestos, the load shall be exempt from such inspection.

5.2.4 Asbestos testing shall be conducted using polarized light microscopy in accordance with applicable local, state/provincial/regional, or national/federal regulations.

NOTE 2—As an example, EPA Method 600-R-93-116 is used in the U.S. for building materials.

NOTE 3—Additional information on the presence of asbestos may be obtained using transmission electron microscopy.

5.2.5 If asbestos is determined to be present, as defined in relevant local, state/provincial/regional, and national/federal regulations, at any time during the testing process, the entire load containing the asbestos contaminated shingles shall be rejected, removed from the facility, and properly disposed of at a licensed and/or permitted landfill or other regulated waste containment facility.

NOTE 4—As an example, according to EPA Method 600-R-93-116, the presence of asbestos concentration more than 1 % indicates an asbestos containing material.

5.2.6 No shingles containing asbestos shall be included in the outgoing RAS product.

5.2.7 The outgoing RAS product shall be processed so that 100 percent passes the 12.5 mm (½ in.) sieve and at least 95 percent passes the 9.5-mm (¾ in.) sieve.

5.2.8 The outgoing RAS product shall be substantially free of extraneous waste materials and entirely free of whole, intact nails. Total extraneous materials such as metals, glass, rubber, nail fragments, soil, brick, tars, paper, wood and plastic shall not exceed 1 percent by mass. Lightweight extraneous materials such as paper, wood and plastic shall not exceed 0.5 percent by mass.

5.2.9 The outgoing RAS product shall not contain more than 15 percent moisture. The operator shall take necessary steps to ensure excessive moisture is not retained in the RAS stockpiles.

5.2.10 The operator shall test the samples for compliance with the requirements specified herein (in accordance with requirements provided in Section 6).

5.2.11 All samples shall comply with the requirements specified herein. Noncompliance shall necessitate that the entire stockpile be rejected.

5.3 The operator shall complete a Facility and Material Certification Form (an example is presented in [Annex A1](#)). A different (for example, company-specific) form may be used provided that all of the information contained on the form in [Annex A1](#) is included.

6. Material Quality Control Testing

6.1 *General*—Quality control testing shall be conducted on the finished RAS product after screening or other finishing processes are completed.

6.2 Testing shall be completed using the following procedures:

6.2.1 For testing, the sampling criteria shall be based on designations by the specifying entity.

6.2.2 If specified values are not provided, operator shall: