Designation: D7274 – 06a (Reapproved 2011)

Standard Test Method for Mineral Stabilizer Content of Prefabricated Bituminous Geomembranes (BGM)[1]

This standard is issued under the fixed designation D7274; 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 test method covers the procedure for the determination of mineral stabilizer content in prefabricated bituminous geomembranes (BGM) by calcination.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D4354 Practice for Sampling of Geosynthetics for Testing

D4439 Terminology for Geosynthetics

D6455 Guide for the Selection of Test Methods for Prefabricated Bituminous Geomembranes (PBGM)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *prefabricated bituminous geomembrane (BGM), n*—a material fabricated in a plant and consisting principally of non-woven polyester textile, impregnated by a blend of oxidized or polymer-modified bitumen incorporating filler.

3.1.2 *mineral stabilizer, n*—a fine, water-insoluble inorganic material, used in admixture with solid or semisolid bituminous materials.

3.2 For definitions of other terms used in this test method, refer to Terminology D4439.

4. Significance and Use

4.1 Bituminous geomembranes, whether made from oxidized or polymer-modified bitumen, may contain a significant amount of mineral stabilizer. The amount of mineral stabilizer used in a bituminous geomembrane has an effect on several physical properties, including but not limited to cold temperature, flexibility, and asphalt penetration (see Guide D6455 for a list of BGM properites).

5. Apparatus

5.1 *Porcelain Crucible,* 30 cm^3 capacity, or equivalent.

5.2 *Analytical Balance,* capable of weighing to within ± 0.001 g.

5.3 *Bunsen Burner.*

5.4 *Muffle Furnace,* capable of maintaining a temperature of 600 ± 25°C (1110 ± 45°F).

6. Hazards

6.1 Calcination of BGM involves the use of open flame and will produce black smoke. This procedure should be carried out under a fume hood, away from any flammable material.

7. Sampling and Conditioning

7.1 Sampling shall be conducted according to Practice D4354.

7.2 Remove any surface material from the sample at the location where the test specimen will be taken. This operation will be easier when location is chosen on the side of the BGM with film surfacing or on the film-covered lap. In that case, the BGM may be cooled to about –30°C for 2 hours and the film may be peeled off.

7.3 Using a hot spatula or knife, sample 5 ± 1 g of bitumen from the BGM, taking care of not scraping down to the reinforcing geotextile.

7.4 Condition samples for a minimum of 4 h at 23 ± 3°C (73.4 ± 5.4°F) and 50 ± 5 % relative humidity before testing.

8. Procedure

8.1 Preheat the muffle furnace at 600 ± 25°C (1110 ± 45°F).

[1] This test method is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.10 on Geomembranes.

Current edition approved June 1, 2011. Published July 2011. Originally approved in 2006. Last previous edition approved in 2006 as D7274–06a. DOI: 10.1520/D7274-06AR11.

[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.

8.2 Weigh the porcelain crucible to the nearest 0.001 g (C_1).

8.3 Place the sample obtained in 7.3 in the crucible and weigh to the nearest 0.001 g (C_2).

8.4 Under the fume hood, place the crucible over the Bunsen burner flame until combustion is completed.

8.5 Using adequate holding device, place the crucible in the muffle furnace set at 600 ± 25°C (1110 ± 45°F) for 60 ± 5 minutes. Verify that the crucible is free of any black combustion residue. If any are present, place the crucible in the furnace for an additional 30 ± 5 minutes.

8.6 Let the crucible and its contents cool in a dessicator for 15 ± 1 minutes.

8.7 Weigh the crucible to the nearest 0.001 g (C_3).

9. Calculation

9.1 Calculate the mineral stabilizer content of the bitumen (S_C) using the following equation:

$$S_C = \frac{C_3 - C_1}{C_2 - C_1} \times 100 \quad (1)$$

10. Report

10.1 Report the following information:

10.1.1 Complete identification of the material tested,

10.1.2 Test temperature,

10.1.3 Any deviation of the specified test procedure, as well as any possible incident.

10.1.4 Specimen mineral stabilizer content (S_C).

11. Precision and Bias

11.1 The precision and bias of this test method have not been established. Round robin test should be conducted to establish these values.

12. Keywords

12.1 BGM; bituminous; calcination; destructive; geomembranes; mineral stabilizer