Designation: D7275 – 07 (Reapproved 2012)

Standard Test Method for Tensile Properties of Bituminous Geomembranes (BGM)[1]

This standard is issued under the fixed designation D7275; 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 is used to measure the tensile properties of bituminous geomembranes (BGM) using a dumbbell shape specimen.

1.2 The values stated in SI units are to be regarded as 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]

D638 Test Method for Tensile Properties of Plastics

D4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control Products(RECPs) 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 geotextile, impregnated by a blend of oxidized or polymer-modified bitumen incorporating filler.

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

4. Significance and Use

4.1 This method is used to evaluate the tensile properties of BGM. It can be used for manufacturing quality control or acceptance testing.

4.2 This test method uses a dumbbell specimen. The shape and dimensions of the specimen are defined in this standard. No other shape or dimensions are allowed. Other mechanical properties of BGM may be measured using different test methods. Refer to Guide D6455.

4.3 The reported properties are the maximum strength and elongation at maximum strength.

5. Apparatus

5.1 Tensile instrumentation shall meet the requirements outlined in Test Method D638.

5.2 *Grips*—One of the grips must be self aligning to compensate for uneven distribution of force across the specimen. The clamping force and the clamp surfaces shall hold the specimen firmly without causing damage.

5.3 *Grip Faces*—Grip faces shall be a minimum of 50 mm (2 in.) wide and a minimum of 50 mm (2 in.) in length. Smooth rubber, fine serrated or coarse serrated grip faces have all been found to be suitable for testing BGM. If needed, the use of a silicone-coated paper to help holding the specimen ends into the grips is recommended. The silicone-coated side is to be used in contact with the specimen.

6. Sampling and Test Specimens

6.1 Sampling shall be conducted according to Practice D4354.

6.2 Take a sample that will exclude material from the outer wrap of the roll or the inner wrap around the core. In the case where the sample is taken at the production site, material from the outer wrap may be used if it is undamaged.

6.3 *Test Specimens*—Prepare five specimens with the length of the specimen parallel to the machine direction (MD) and five specimens with the length parallel to the cross-machine direction (XD).

6.4 The specimens shall be cut using an appropriate die to the shape, dimensions, and tolerances presented in Fig. 1.

[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.

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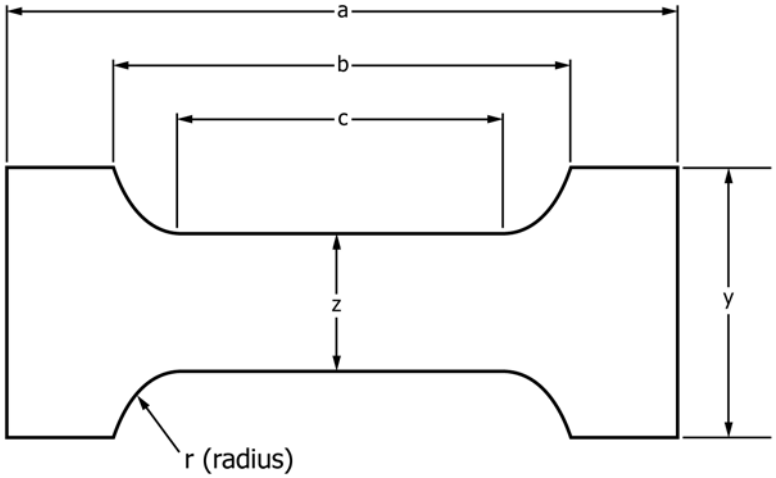
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.



a	125 ± 1 mm (4.92 ± 0.04 in.)	r	12.5 ± 1 mm (0.492 ± 0.04 in.)
b	85 ± 1 mm (3.35 ± 0.04 in,)	y	50 ± 1 mm (1.97 ± 0.04 in.)
c	60 ± 1 mm (2.36 ± 0.04 in.)	z	25 ± 0.25 mm (0.984 ± 0.1 in.)

FIG. 1 Shape, Dimensions, and Tolerances for Dumbbell Specimen

7. Conditioning and Testing

7.1 Samples shall be conditioned for at least 24 h at 21 ± 2°C (70 ± 4°F) and 50 – 70 % relative humidity. The samples shall be conditioned flat and shielded from the sun.

7.2 Testing shall be conducted at 21 ± 2°C (70 ± 4°F) and 50 – 70 % relative humidity.

8. Procedure

8.1 Clamp a specimen so that the specimen is centered in the clamps with the sides of the clamps being parallel to the test direction.

8.2 Elongate the specimen to rupture at a test speed of 50 mm/min (2 in./min). If the specimen slips in the clamps, breaks in the clamps, breaks outside its narrow section, or if for any reason attributable to faulty operation, the result falls markedly below the average for the set of specimens, discard the result and test an additional specimen.

8.3 Record the maximum load and grip separation at maximum load.

8.4 Repeat the procedure for the remaining specimens.

9. Calculation

9.1 Calculate the maximum strength of individual specimens in force per unit width, kN/m (lbf/in.), by dividing the maximum load (in kN) by the width of each specimen in its narrow section (0.025 m).

9.2 Calculate the elongation at maximum strength of each individual specimen by dividing the increase in grip separation at maximum load (in mm) by the initial nominal length of the specimen's narrow section (60 mm), expressed as a percentage.

9.3 Calculate the average and standard deviation for maximum strength and elongation at maximum strength. Calculate the results for each test direction separately.

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,

10.1.4 Each individual specimen maximum strength and elongation at maximum strength, and

10.1.5 The average and standard deviation for maximum strength and elongation at maximum strength. Report each test direction results separately.

11. Precision and Bias

11.1 The precision and bias of this test method have not been established yet.

12. Keywords

12.1 BGM; bituminous geomembrane; elongation; mechanical properties; tensile