



Designation: D3617/D3617M – 16

# Standard Practice for Sampling and Analysis of Built-Up Roof Systems During Application<sup>1</sup>

This standard is issued under the fixed designation D3617/D3617M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 This practice is a guide for removing specimens for built-up bituminous roof systems during application, but before the application of flood coating and top surfacing, for determining the *approximate* quantities of the components and the possible presence of moisture, or dry spots between plies, in the field. Components may consist of:

- 1.1.1 Insulation, when part of the roof membrane system,
- 1.1.2 Plies of roofing felt,
- 1.1.3 Interply layers of bituminous material, and
- 1.1.4 Top coating, if present, before any surfacing aggregate has been applied.

1.2 This practice is applicable to both 914-mm [36-in.] and 1000-mm [39  $\frac{3}{8}$ -in.] wide felt rolls.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *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:*<sup>2</sup>

[D226/D226M Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing](#)

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.20 on Roofing Membrane Systems.

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

[D227/D227M Specification for Coal-Tar-Saturated Organic Felt Used in Roofing and Waterproofing](#)

[D250 Standard Specification for Asphalt-Saturated Asbestos Felt Used in Roofing and Waterproofing \(Withdrawn 1991\)](#)<sup>3</sup>

[D2178/D2178M Specification for Asphalt Glass Felt Used in Roofing and Waterproofing](#)

[D2626/D2626M Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing](#)

[D3158 Specification for Asphalt Saturated and Coated Organic Felt Used in Roofing \(Withdrawn 1983\)](#)<sup>3</sup>

[D3378 Specification for Asphalt-Saturated and Coated Asbestos Felt Base Sheet Used in Roofing \(Withdrawn 1985\)](#)<sup>3</sup>

## 3. Sampling

3.1 Unless otherwise specified, take at least one specimen for each separate roof, plus one for each 929 m<sup>2</sup> [10 000 ft<sup>2</sup>]; take specimens at random.

3.2 If deficiencies are indicated in the membrane, additional Practice D3617/D3617M test cuts shall be taken at four locations diagonally—3 m [10 ft] in each direction—from the original test cut to determine the extent of the deficient area.

## 4. Test Specimen

4.1 Sweep the surface of the membrane clean where each test specimen will be taken.

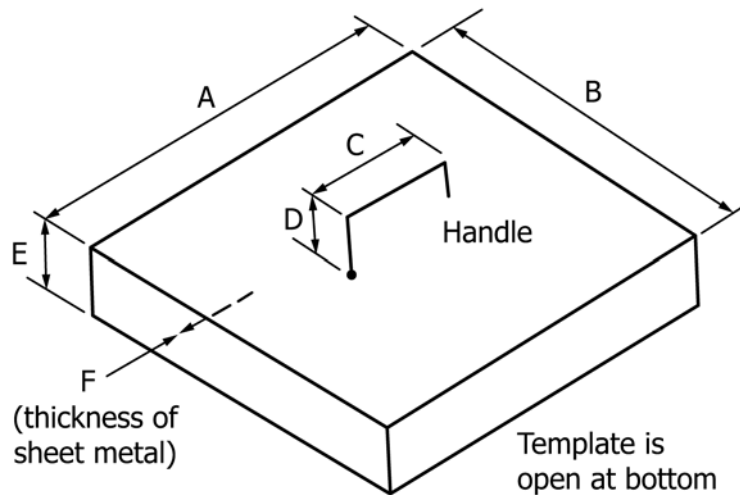
4.2 For determining approximate quantities of components, cut a 300- by 300-mm [12- by 12-in.] specimen from the membrane using a template (Fig. 1).

4.2.1 If the membrane is adhered to the insulation, remove the membrane from the adhering insulation.

4.2.2 If the membrane is adhered directly to the roof deck, estimate the quantity of bitumen remaining on the deck after the specimen is removed.

4.3 For the purpose of determining the felt spacing, cut a 100- by 111-mm [4- by 44-in.] rectangular specimen from the

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).



Dimension	Square (4.2)		Rectangular (4.3)	
	mm	in.	mm	in.
A	300	12	100	4
B	300	12	1000	40
C	150	6	150	6
D	40	1.5	40	1.5
E	40	1.5	40	1.5
F	3	1/8	3	1/8

FIG. 1 Dimensions of Templates for Roof Sampling

membrane, using a template (Fig. 1) placed at right angles to the long dimension of the felts.

4.4 Identify each specimen by location and record the presence of insulation or the estimated quantity of bitumen remaining on the deck.

4.5 If practicable, return the cut membrane specimen to its original location in the roof. Make adequate repairs to the roofing system, using at least the same number of felt plies as the original roof membrane after testing.

## 5. Procedure

5.1 Remove insulation fully from the 300- by 300-mm [12- by 12-in.] specimen, if present, being careful to remove as little bituminous material as possible or leave the insulation in place and later use manufacturer's information to correct for its weight. Determine the area of the specimen from three different measurements in each direction and weigh.

5.2 Measure the individual felts and calculate the area of each ply as in 5.1 (as a result of lapping not all plies will be the same size as the original specimen).

5.3 Visually check along the sample edges for moisture within the membrane and skips or dry spots between layers of felt.

5.4 Determine the number of plies and lap spacing by visual examination of the 100- by 1118-mm [4- by 44-in.] specimen, if lap spacing is desired.

## 6. Calculation (See Table 1 for Form and Sample Computation)

6.1 Calculate the mass (weight) per unit area of the original specimen by dividing the specimen's weight by its area (and multiplying by 100 if U.S. customary units are used).

6.2 Divide the sum of the individual felt areas by the area of the original specimen, and record as the "number of plies."

6.3 Calculate the mass per unit area of the saturated felts in the original specimen by dividing the individual felt areas by the area of the original specimen, and then multiplying by the following values. Add the masses per unit area for each felt to find the total mass per unit area of the original felts. If all the plies are the same, multiply the assumed felt mass per unit area by the number of plies (6.2). Use manufacturer's information for components not within the scope of the following specifications:

6.3.1 *Specification D226/D226M*—Use 635 g/m<sup>2</sup> [13 lb/100 ft<sup>2</sup>] for Type I; 1270 g/m<sup>2</sup> [26 lb/100 ft<sup>2</sup>] for Type II; and 830 g/m<sup>2</sup> [17 lb/100 ft<sup>2</sup>] for Type III.

6.3.2 *Specification D227/D227M*—Use 635 g/m<sup>2</sup> [13 lb/100 ft<sup>2</sup>].

6.3.3 *Specification D250*—Use 635 g/m<sup>2</sup> [13 lb/100 ft<sup>2</sup>] for Type I and 1367 g/m<sup>2</sup> [28 lb/100 ft<sup>2</sup>] for Type II.

6.3.4 *Specification D2178/D2178M*—Use 366 g/m<sup>2</sup> [7.5 lb/100 ft<sup>2</sup>] for Type I; 474 g/m<sup>2</sup> [9.7 lb/100 ft<sup>2</sup>] for Type III; 342 g/m<sup>2</sup> [7.0 lb/100 ft<sup>2</sup>] for Type IV; and 713 g/m<sup>2</sup> [14.6 lb/100 ft<sup>2</sup>] for Type V.