Designation: D 2829 – 97

# Standard Practice for Sampling and Analysis of Built-Up Roofs[1]

This standard is issued under the fixed designation D 2829; 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 is a guide for removing test specimens from built-up roofing systems in the field and for determining the *approximate* quantities of the components of that specimen (Note 1). Components determined may be:

1.1.1 Insulation components when they are part of the roof membrane system,

1.1.2 Plies of roofing felt,

1.1.3 Interply layers of bituminous material,

1.1.4 Top coating, and

1.1.5 Surfacing.

NOTE 1—This procedure is for the investigation of existing roofs and is not intended for new construction inspection.

1.2 The values stated in SI (metric) units are to be regarded as standard.

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 this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary information, see 6.3.2.1.

## 2. Referenced Documents

2.1 *ASTM Standards:*

D 226 Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing[2]

D 227 Specification for Coal-Tar-Saturated Organic Felt Used in Roofing and Waterproofing[2]

D 249 Specification for Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules[2]

D 250 Specification for Asphalt-Saturated Asbestos Felt Used in Roofing and Waterproofing[2]

D 371 Specification for Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules; Wide Selvage[2]

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials[2]

D 2178 Specification for Asphalt Glass Felt Used in Roofing and Waterproofing[2]

D 2626 Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing[2]

D 3158 Specification for Asphalt-Saturated and Coated Organic Felt Used in Roofing[3]

D 3617 Practice for Sampling and Analysis of New Built-Up Roof Membranes[2]

D 3672 Specification for Venting Asphalt-Saturated and Coated Inorganic Felt Base Sheet Used in Roofing[4]

D 3909 Specification for Asphalt Roll Roofing (Glass Felt) Surfaced With Mineral Granules[2]

D 4601 Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing[2]

D 4897 Specification for Asphalt-Coated Glass-Fiber Venting Base Sheet Used in Roofing[2]

D 4990 Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing[2]

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D 1079.

## 4. Securing of Specimens in the Field

4.1 Do not disturb any surfacing in the area from which a specimen is to be taken. Cut each specimen at least 300 by 300 mm (12 by 12 in.) and use the total specimen taken in the field for laboratory analysis.

4.2 The recommended practice is to use a cutting template (Fig. 1) consisting of a 300 by 300-mm (12 by 12-in.) metal box with an open bottom. Place the box over the roof area that is to be removed, and while the template is held firmly in position, remove the surfacing around the perimeter and then cut through the roof membrane around the perimeter of the box. Lift the specimen including all associated loose materials, from the roof and place it in a plastic bag. Fully identify the specimen. Note if the insulation is adhered to the specimen or, where insulation is not used, if bitumen is left on the deck, and the type of deck. Estimate bitumen mass per unit area left on the deck.

[1] This practice is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing, and Bituminous Materials and is the direct responsibility of Subcommittee D08.20 on Roofing Membrane Systems.

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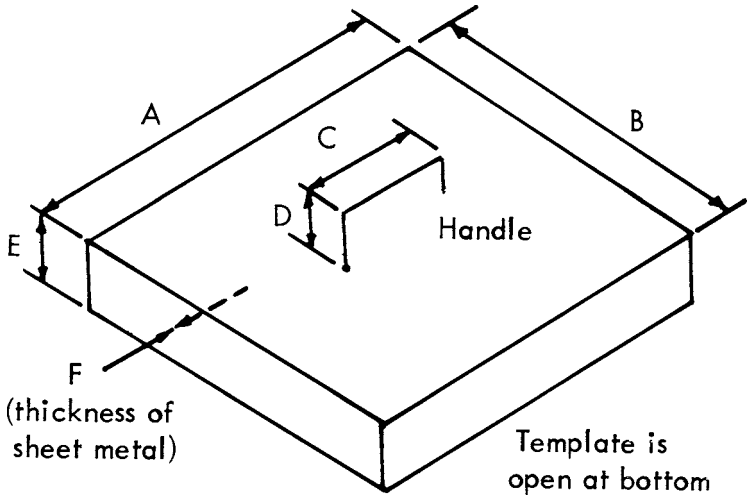
[2] *Annual Book of ASTM Standards*, Vol 04.04.

[3] Discontinued—See *1984 Annual Book of ASTM Standards*, Vol 04.04.

[4] Discontinued—See *1990 Annual Book of ASTM Standards*, Vol 04.04.

TABLE 1 Dimensions




| Dimension | Square (3.2) | | Rectangular (3.4) | |
|---|---|---|---|---|
| | 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 | ⅛ | 3 | ⅛ |

FIG. 1 Cutting Template

4.2.1 *Alternate Method:*

4.2.1.1 Mark each sample as at least a square 356 mm (14 in.) on a side. Try to include a seam in each membrane sample. During cold weather, use a square 457 mm (18 in.) on a side, since cold weather cutting may inadvertently break, distort or delaminate the sample. If the roofing membrane is mechanically fastened, mark rectangular 864 by 457 mm (34 by 18 in.) sample, with the longer dimension perpendicular to the length of the ply felts. Half of these large samples can be shipped to the laboratory for analysis after the number of fasteners in the larger area is recorded.

4.2.1.2 Carefully broom off the loose aggregate, and spud off the adhered aggregate and flood coating at the perimeter of the sample. (The application of dry ice at the areas to be spudded will ease the removal of the top coating during hot weather. A large propane torch can also be used as an alternate to the dry ice method, to melt the top coating so that it can be easily removed with a scraper and facilitate cutting.) Record the length and width of the sample. If the quantities of unadhered surfacing or total surfacing are desired, collect and package the unadhered surfacing from the sample area.

4.2.1.3 Cut through the roofing membrane with a razor knife or sharp power cutting tool, taking care not to damage the edge of the sample. Do not pound on the sample, as this might cause interply delamination. Carefully loosen and remove the roofing membrane including all adhered insulation. Observe and record the kind and degree of attachment between the roofing membrane and the insulation or deck.

4.2.1.4 Cut through the roof insulation with a blade long enough to penetrate all of the insulation layers. Observe and record the type and thickness of each insulation layer, and the percent of the sample area adhered between the layers and between the insulation and the deck and vapor retarder.

4.2.1.5 Cut and remove a small specimen of the vapor retarder, if it is present, to observe its attachment to the deck and to obtain a specimen for moisture content and analysis.

NOTE 2—This procedure will not provide as accurate a measure of total aggregate as the procedure described in 4.2.

4.3 If bituminous material has been absorbed by the insulation (4.2), remove sufficient insulation to allow laboratory analysis of absorbed bitumen mass (weight).

4.4 If felt lapping is to be determined, take a separate specimen at least 100 mm (4 in.) wide and not less than 1 m (40 in.) long, cut at right angles to the long dimension of the roofing felts.

4.5 Protect each specimen from physical damage such as bending or breakage of the felts or coating layers during removal and transportation. Protect from moisture, excessive heat, and loss of material.

## 5. Significance and Use

5.1 This practice is for the sampling and analysis of built-up roofs. For roofs under construction, use Practice D 3617.

## 6. Procedure

6.1 Preserve all identifications and log the specimens in the laboratory. Ensure continued identity and location of the components within each specimen. Remove the insulation fully (if present), removing as little bituminous coating from the underside of the membrane as possible.