



Designation: D5869/D5869M – 07a (Reapproved 2023)

Standard Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials¹

This standard is issued under the fixed designation D5869/D5869M; 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 establishes a procedure and conditions of temperature and time for heat exposure of roofing and waterproofing materials and systems in the presence of air.

1.2 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 nonconformance with the 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 of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

- D883 Terminology Relating to Plastics
- D1079 Terminology Relating to Roofing and Waterproofing
- D1566 Terminology Relating to Rubber
- E145 Specification for Gravity-Convection and Forced-Ventilation Ovens
- E230/E230M Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E1137/E1137M Specification for Industrial Platinum Resis-

¹ This practice is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.02 on Steep Roofing Products and Assemblies.

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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.

tance Thermometers

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminologies D883, D1079, and D1566.

4. Summary of Practice

4.1 Specimens of roofing and waterproofing materials are exposed to heat in a dark forced-ventilation oven at a specified elevated temperature for a known period of time.

4.2 This practice specifies an exposure temperature of 70 ± 3 °C [158 ± 5 °F] in a forced-ventilation oven.

4.3 This practice permits the selection of the duration of heat exposure from three specified time periods, which are 35, 90, and 180 ± 0.25 consecutive days. The duration selected must be included in any report of results obtained by using this practice.

NOTE 1—The time period to be used should be specified in any standard that refers to this practice. European standards for polymer-modified bituminous materials specify 180 days at 70 °C. For research purposes, selection of other time periods and temperatures are permitted, provided that the precise duration is stated in any report of results.

4.4 This practice is also used to condition test specimens for time periods much shorter than 35 days for the purpose of conditioning material before testing. When used for this purpose, the shorter conditioning time shall be specified in any report of test results.

5. Significance and Use

5.1 Roofing and waterproofing materials and systems undergo changes in physical properties as a result of being subjected to heat. They also undergo changes in physical properties as they age in service. Since service conditions vary widely, any relationship between changes observed in this practice and changes in service must be established by the user of this practice.

6. Apparatus

6.1 *Oven*—The oven shall have forced ventilation, shall be electrically heated, and shall conform to the requirements of

Specification **E145**, Type IIB. The oven shall be of sufficient size to accommodate the size and number of specimens selected by the user of this practice.

6.2 *Thermometer*—The thermometer shall be an ASTM thermometer, conforming to the requirements for thermometer S12C (or S12F) in accordance with Specification **E2251**. As an alternate, any other thermometric device used shall be at least: (1) of equal accuracy to that of the thermometer specified in Specification **E2251**, (2) capable of indicating temperature to within 1 °C [2 °F], and (3) stable to within 1 °C [2 °F] for the duration of the exposure.

6.2.1 When used, platinum resistance thermometers shall be in accordance with the requirements of Specification **E1137/E1137M**.

6.2.2 When used, thermocouples shall be in accordance with the requirements of Specification **E230/E230M**.

7. Specimens

7.1 The number, geometry, and size of specimens shall be determined by the user of this practice.

8. Heat Exposure

8.1 Expose the specimens in a forced-ventilation oven at 70 ± 3 °C [158 ± 5 °F].

8.2 The specimens shall be supported in the oven on shelves, plates, or other containers appropriate to the specimen being studied. Specimens shall be separated on shelves to allow free access of air. The specimen orientation, vertical, horizontal, and so forth, shall be determined by the user of this practice.

8.3 The duration of exposure of the specimens to the heat shall be selected by the user of this practice from the following options: (1) 35 ± 0.25 consecutive days; (2) 90 ± 0.25 consecutive days; or (3) 180 ± 0.25 consecutive days. (See also 4.4.)

9. Report

9.1 Report the following information:

9.1.1 State the geometry of the specimen, orientation during the exposure, and nature of support.

9.1.2 Report the duration of exposure to the heat.

10. Keywords

10.1 dark oven exposure; heat exposure; roofing and waterproofing materials

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