



# Standard Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials<sup>1</sup>

This standard is issued under the fixed designation G7/G7M; 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 covers procedures to be followed for direct exposure of nonmetallic materials to the environment. When originators of a weathering test have the actual exposure conducted by a separate agency, the specific conditions for the exposure of test and control specimens must be clearly defined and mutually agreed upon between all parties.

1.2 For exposures behind glass, refer to Practice [G24](#).

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 practice is technically equivalent to the parts of ISO 877 that describe direct exposures of specimens to the environment.

1.5 *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>

[E41](#) Terminology Relating To Conditioning

[E824](#) Test Method for Transfer of Calibration From Reference to Field Radiometers

[E913](#) Method for Calibration of Reference Pyranometers

[With Axis Vertical by the Shading Method](#) (Withdrawn 2005)<sup>3</sup>

[E941](#) Test Method for Calibration of Reference Pyranometers With Axis Tilted by the Shading Method (Withdrawn 2005)<sup>3</sup>

[G24](#) Practice for Conducting Exposures to Daylight Filtered Through Glass

[G113](#) Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

[G130](#) Test Method for Calibration of Narrow- and Broad-Band Ultraviolet Radiometers Using a Spectroradiometer

### 2.2 ISO Standards:

[ISO 877](#) Plastics—Methods of Exposure to Direct Weathering; to Weathering Using Glass-Filtered Daylight, and to Intensified Weathering by Daylight Using Fresnel Mirrors<sup>4</sup>

[ISO 9370](#) Plastics—Instrumental Determination of Radiant Exposure in Weathering Tests—General Guidance and Basic Test Method<sup>4</sup>

### 2.3 ASTM Adjuncts:

A Test Rack<sup>5</sup>

## 3. Terminology

3.1 *Definitions*—The definitions given in Terminology [E41](#) and Terminology [G113](#) are applicable to this practice.

## 4. Significance and Use

4.1 The relative durability of materials in natural exposures can be very different depending on the location of the exposure because of differences in ultraviolet (UV) radiation, time of wetness, temperature, pollutants, and other factors. Therefore, it cannot be assumed that results from one exposure in a single location will be useful for determining relative durability in a different location. Exposures in several locations with different

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee [G03](#) on Weathering and Durability and is the direct responsibility of Subcommittee [G03.02](#) on Natural and Environmental Exposure Tests.

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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.

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

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

<sup>5</sup> Detailed drawings for an acceptable test rack may be obtained from ASTM International. Request ADJG0007.