



Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units¹

This standard is issued under the fixed designation E546; 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.

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

1. Scope

1.1 This test method describes a laboratory procedure for determining the frost/dew point within the air space(s) of sealed insulating glass units, and establishes the criteria for determining whether that point is below or above a given or specified temperature.

1.2 This test method also describes the apparatus to be used for these determinations.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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.* For specific hazard statements, see 9.1.3.

2. Referenced Documents

2.1 ASTM Standards:²

C1036 Specification for Flat Glass

E77 Test Method for Inspection and Verification of Thermometers

E576 Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position

E631 Terminology of Building Constructions

¹ This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.22 on Durability Performance of Building Constructions.

Current edition approved Dec. 1, 2014. Published December 2014. Originally approved in 1975. Last previous edition approved in 2008 as E546 – 08. DOI: 10.1520/E0546-14.

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.

3. Terminology

3.1 **Definitions**—For definitions of general terms used in this test method, refer to Terminology **E631**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 **frost/dew point, n**—the temperature at which water, organic vapor, or other chemicals begin to appear on the interior glass surface of a sealed insulating glass unit in contact with the measuring surface of the frost/dew-point apparatus.

3.2.2 **frost state**—the case where the frost/dew point of a sealed insulating glass unit is above the test temperature specified by the purchaser or user.

3.2.3 **no-frost state**—the case where the frost/dew point of a sealed insulating glass unit is below the temperature specified by the purchaser or user.

4. Summary of Test Method

4.1 This test method is conducted by the use of a special apparatus, consisting basically of two chilled cylindrical metal blocks positioned one over the other and separated by a gap of controllable distance. The upper block has an exposed flat circular surface, 1 in. (25 mm) in diameter, and can be chilled to far below the ice point by regulating the air-gap distance between it and the lower metal block which is maintained at approximately –109°F (–78°C) by dry ice. The test specimen is placed in contact with this chilled flat circular surface of the upper block for specified short periods of time, with the metal surface at successively lower temperatures, to determine at what temperature frost appears on the corresponding lower air space glass surface.

5. Significance and Use

5.1 This test method and the apparatus described are intended primarily for sealed insulating glass units positioned horizontally. If the procedure is applied to such units in other than a horizontal position, the results may not be comparable to those obtained by this procedure.

NOTE 1—A similar method is Test Method **E576**.