



Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units Using Spark Emission Spectroscopy¹

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1. Scope

1.1 This test method covers procedures for using a spark emission spectroscope to determine the concentration of argon gas in the space between the lites of a sealed insulating glass unit.

1.2 This is a non-destructive test method.

1.3 This test method shall be used only in a controlled laboratory environment.

1.4 This test method is applicable for insulating glass units where argon has been added to the sealed insulating glass cavity and the balance of the gas is atmospheric air.

1.5 This test method is applicable for clear, double-glazed insulating glass units.

1.6 This test method is applicable for double-glazed insulating glass units with one lite having a metallic coating or tinted glass, or both, and with clear glass as the other lite.

1.7 This test method is applicable for triple-glazed insulating glass units only when the center lite of glass has a metallic coating (either low emissivity (low E) or reflective) and both of the other lites are clear glass.

1.8 This test method also includes a procedure for verifying the accuracy of the readings of the test apparatus.

1.9 The values stated in SI units are to be regarded as the standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.10 *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 warning statements, refer to 7.1.

2. Referenced Documents

2.1 ASTM Standards:²

C162 Terminology of Glass and Glass Products

C717 Terminology of Building Seals and Sealants

E631 Terminology of Building Constructions

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2190 Specification for Insulating Glass Unit Performance and Evaluation

3. Terminology

3.1 *Definitions:* For definitions of terms found in this test method, refer to Terminologies **C162**, **C717**, and **E631**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *sealed insulating glass unit*—an assembled unit, comprising sealed lites of glass separated by dehydrated space(s), normally intended for clear vision areas of buildings.

4. Summary of Test Method

4.1 The spark emission spectroscope is placed against the glass surface of a sealed insulating glass unit in a prescribed manner. A high voltage, at low current, is applied to the glass surface. This voltage creates a spark which induces a plasma from the gas molecules inside the test specimen. This causes light emissions (photons) of characteristic wavelengths. The instrument then collects the photons and analyzes them by spark emission spectroscopy. The resulting spectrum is compared to calibration data internal to the instrument to determine the concentration of argon inside the unit.

5. Significance and Use

5.1 This test method is intended to provide a means for determining the concentration of argon in sealed insulating glass units under controlled conditions in compliance with the apparatus manufacturer's instructions.

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.

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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.