



Designation: E2953 – 14

Standard Specification for Evaluating Accelerated Aging Performance of Electrochromic Devices in Sealed Insulating Glass Units¹

This standard is issued under the fixed designation E2953; 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 specification is applicable to all electrochromic (EC) glass whose visible light transmittance or near infrared light transmittance properties, or both, can be changed reversibly by the application or removal of an electrical voltage. This includes absorptive and reflective EC devices.

1.2 This specification does not apply to other types of dynamic glass which do not solely require an electrical stimulus to change light transmittance such as photochromic and thermochromic glazings and hybrid active/passive chromogenics.

1.3 This specification covers electrochromic devices in preassembled permanently sealed insulating glass units with one or more cavities in which at least one lite contains an EC device (which may be in the form of a laminated lite or a single pane with coatings applied). This specification is also applicable to EC devices in preassembled insulating glass units with capillary tubes intentionally left open. As such this specification also requires conformance to Specification E2190.

1.4 This specification is applicable only to sealed insulating glass units that are constructed with glass and fabricated for vision glass areas for use in buildings, such as sliding doors, windows, skylights, and exterior wall systems.

1.5 Qualification under this specification is intended to provide a basis for evaluating the aging performance of electrochromic devices in sealed insulating glass units.

1.6 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *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*:²

C162 Terminology of Glass and Glass Products

C717 Terminology of Building Seals and Sealants

E631 Terminology of Building Constructions

E2141 Test Method for Accelerated Aging of Electrochromic Devices in Sealed Insulating Glass Units

E2190 Specification for Insulating Glass Unit Performance and Evaluation

3. Terminology

3.1 *Definitions*—For definitions of terms found in this specification, refer to Terminologies C162, C717, and E631.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *dynamic range*—the visible light transmittance range of an EC device, measured as the difference between the visible light transmittance of the highest transmittance state and the lowest transmittance state.

3.2.2 *electrochromic device (ECD), n*—a combination of materials that include materials in which the transmittance, reflection, and absorption properties can be altered, and other layers, such as transparent conducting oxide (TCO) layers for altering the optical properties (for example, transmittance, reflectance, absorptance) of the device in response to an applied electric field.

3.2.3 *electrochromic (EC) glazing, n*—in a prepared opening of a building, the material installed which consists of an ECD with layer(s) of materials in which the optical properties can change in response to an applied electrical field, attendant materials, and one or more lites of glass.

3.2.4 *highest transmittance state, n*—also referred to as the *clear state* or *bleached state*, a descriptor for an EC glazing when it is in the transmittance state with the highest photopic specular light transmittance.

3.2.5 *lowest transmittance state, n*—also referred to as the *tinted state*, *dark state*, or *colored state*, a descriptor for an EC

¹ This specification 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.