



Standard Practice for Evaluating the Service Life of Chromogenic Glazings¹

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1. Scope

1.1 This practice is intended to provide guidance to architects, specifiers, manufacturers, and other parties who have an interest in evaluating the service life of chromogenic glazings.

1.2 This practice is intended to cover the main factors about service life that must be considered when evaluating glazings for performance until the failure time is reached. However, users of this practice must be aware that other factors must be considered, such as the effect of the interaction of materials, the use of the glazings, and to the environment in which a chromogenic glazing is exposed over its service life. Users of this practice are specifically cautioned to be aware that failure of the plastic polyurethane thermal barrier in an aluminum window containing a chromogenic glazing can cause a spreading or outward rotation of the glazing legs, called “hinging” or “clamping,” which reduces the edge pressure on an insulated glazing (IG) unit, causing edge seal failure of the IG unit and allowing water to enter the IG unit and the glazing pocket.

1.3 The test methods referenced herein are laboratory tests conducted under specified conditions. These test methods are intended to simulate and, in some cases, to also accelerate actual in-service use of the chromogenic glazings. Results from these test methods cannot be used to predict the performance with time of units in the field unless actual corresponding field tests have been conducted and appropriate analyses have been conducted to show performance can be predicted from accelerated aging test methods.

2. Referenced Documents

2.1 ASTM Standards:

C 168 Terminology Relating to Thermal Insulating Materials²

E 632 Practice for Developing Accelerated Tests to Aid Prediction of the Service Life of Building Components and Materials³

G 113 Terminology Relating to Natural and Artificial

Weathering Tests of Nonmetallic Materials³

3. Terminology

3.1 *Definitions*—Refer to the terminology given in Terminologies C 168 and G 113 and Practice E 632 for definitions of general terms.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *accelerated aging test*—an aging test in which the rate of degradation of building components or materials is intentionally accelerated over that expected in actual service.

3.2.2 *chromogenic glazing*—a glazing consisting of one or more layers of chromogenic materials, which are able to alter their optical properties in response to a change in ambient conditions such as illumination intensity, temperature, applied electric field, and so forth. The changeable optical properties include transmittance, reflectance, absorptance, and emittance.

3.2.3 *durability*—the capability of maintaining the serviceability of a product, component, assembly, or construction over a specified time.

3.2.4 *serviceability*—the capability of a building product, component, assembly, or construction to perform the function(s) for which it was designed and constructed.

3.2.5 *service life (of a building component or material)*—the period of time after installation during which all properties exceed minimum acceptable values when routinely maintained.

4. Significance and Use

4.1 This practice is important because producers of chromogenic glazings cannot wait for real-time in-service use to assess the product lifetime. Thus, a procedure is needed to estimate failure times based on accelerated weathering and related factors and tests. This practice does not provide guidance for how to follow the steps outlined as follows, but it provides as much information as is practical in an ASTM practice.

5. Background

5.1 Observations and measurements have shown that some of the performance characteristics of chromogenic glazings have a tendency to deteriorate over time. In selecting materials and glazings for any application, the ability of that glazing to perform over time is an indication of that glazing’s durability. The ability of the product to perform over time, at or better

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² *Annual Book of ASTM Standards*, Vol 04.06.

³ *Annual Book of ASTM Standards*, Vol 14.04.