SAE INTERNATIONAL

SURFACE VEHICLE STANDARD

J2412™ NOV2023

Issued 2003-11
Revised 2023-11

Superseding J2412 AUG2015

Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Xenon-Arc Apparatus

RATIONALE

This document is revised to correct a number of editorial errors, including an error in Section 2. Additionally, two technical updates are included. The first update is regarding the optional use of a window glass filter. The other update states 0.55 $W \cdot m^{-2} \cdot nm^{-1}$ as the recommended irradiance value and allows other values in the notes. This is inverse of the current table, which states no recommendation and includes the 0.55 value in the notes.

1. SCOPE

This test method specifies the operating procedures for a controlled-irradiance, xenon-arc apparatus used for the accelerated exposure of various automotive interior trim components.

Test duration, as well as any exceptions to the specimen preparation and performance evaluation procedures contained in this document, are covered in material specifications of the different automotive manufacturers.

Any deviation to this test method, such as the use of optical filter combinations, is to be agreed upon by contractual parties.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1767 Instrumental Color Difference Measurements for Colorfastness of Automotive Interior Trim Materials

SAE J2413 Protocol to Verify Performance of New Xenon ArcTest Apparatus

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/J2412_202311

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D859 Standard Test Method for Silica in Water

ASTM D4517 Standard Test Method for Low-Level Total Silica in High-Purity Water by Flameless Atomic Absorption Spectroscopy

ASTM G113 Standard Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

ASTM G130 Standard Test Method for Calibration of Narrow and Broad-Band Ultraviolet Radiometers Using Spectroradiometer

ASTM G147 Standard Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests

ASTM G151 Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

ASTM G155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Materials

ASTM G156 Standard Practice for Selecting and Characterizing Weathering Reference Materials Used to Monitor Consistency of Conditions in an Exposure Test.

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 AATCC Publications

Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709-2215, Tel: 919-549-8141, www.aatcc.org.

AATCC EP1 Gray Scale for Color Change

AATCC L2 Blue Wool Lightfastness Standard

AATCC L4 Blue Wool Lightfastness Standard

2.3 Polystyrene Plastic Weathering Reference Material

Available from Testfabrics, Inc., 415 Delaware Ave., P.O. Box 26, West Pittston, PA 18643, Tel: 570-603-0432, www.testfabrics.com.

3. DEFINITIONS

3.1 BLACK PANEL THERMOMETER, n

A temperature measuring device consisting of a flat metal plate coated with black coating, designed to absorb most of the radiant energy encountered in fade/weathering testing. A thermal-sensitive element shall be firmly attached to the center of the exposed surface.

NOTE: These devices provide an estimation of the maximum temperature a specimen might attain during exposures to natural light.

3.2 Definitions applicable to this standard can be found in ASTM G151.

4. SIGNIFICANCE AND USE

4.1 This test method is designed to simulate extreme environmental conditions encountered inside vehicle due to sunlight, heat, and humidity for the purpose of predicting the performance of automotive interior trim materials.

5. APPARATUS

5.1 The equipment manufacturer is responsible for the approval of the equipment and for providing the proof of compliance of the critical test parameters, including the different spectral irradiances (also known as spectral power distributions, or SPDs) that are required by contractual parties.

NOTE 1: In normal practice, different instruments (even equipment that is the same model number and from the same manufacturer) may give different results. The result depends on specimen characteristics and instrument design. Refer to ASTM G155 4.3 and 4.4 for more information.

5.2 The apparatus employed utilizes a xenon-arc lamp(s) as the source of radiation. The specimens shall be mounted in a manner to expose the specimens to the uniform conditions of the test chamber. The instrument shall have the means to automatically control irradiance, black panel temperature, chamber temperature and relative humidity.

5.2.1 A more complete description of the apparatus can be found in ASTM G151 and ASTM G155.

5.3 The apparatus shall have an uninsulated black panel thermometer, as described in ASTM G151, unless otherwise agreed upon by contractual parties.

5.4 Manufacturers of exposure devices shall assure that the irradiance at any location in the area used for specimen exposures is at least 70% of the maximum irradiance measured in this area.

5.4.1 If irradiance at any position in the area used for specimen exposure is at 90% of the maximum irradiance, it is not necessary to use periodic repositioning of the specimens during exposure to ensure uniform radiant exposure. While periodic repositioning of the specimens may not be necessary, it is nevertheless good practice in order to be sure that the variability in exposure period is kept to the minimum.

5.4.2 If irradiance at any position in the area used for specimen exposure is between 70% and 90% of the maximum irradiance, specimens shall be periodically repositioned to reduce variability in radiant exposure.