



SURFACE VEHICLE RECOMMENDED PRACTICE

J1647

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Superseding J1647 SEP2007

Plastic Materials and Coatings for Use In or On Optical Parts Such as Lenses and Reflectors of High-Intensity Discharge Forward Lighting Devices Used in Motor Vehicles

RATIONALE

This document was reviewed and reference to the haze requirements of SAE J576 were added. Borosilicate glass was substituted for PYREX which is a brand name.

1. SCOPE

This SAE Recommended Practice provides test methods and requirements to evaluate the suitability of plastic optical materials for possible use in discharge forward lighting (DFL) devices in motor vehicles. These materials are typically used for lenses and reflectors.

Separate testing is required for each combination of material, industrial coating, DFL light source, and device focal length. The tests are intended to determine physical and optical characteristics of the materials and coatings. Performance expectations of finished assemblies, including plastic components, are to be based on tests for lighting devices, as specified in SAE Standards and Recommended Practices for motor vehicle lighting equipment. Optical components exposed to weathering should also be subject to SAE J576.

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 724-776-4970 (outside USA), www.sae.org.

SAE J576 Plastic Material or Materials for Use in Optical Parts Such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices

SAE J578 Color Specification

SAE J2009 Discharge Forward Lighting System and Subsystems

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

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http://www.sae.org/technical/standards/J1647_201501**

ASTM D 1003-00 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics

ASTM E 308-01 Standard Practice for Computing the Colors of Objects by Using the CIE System

2.1.3 CIE Publication

Available from CIE Central Bureau, Babenbergerstrasse 9/9A, 1010 Vienna, Austria, Tel: +43 1 714 31 87, www.cie.co.at.

CIE 1931 System

2.1.4 ISBN Publication

Available from ACGIH, 6500 Glenway Ave., Bldg. D-7, Cincinnati, OH 45211-4438.

ISBN:0936712-81-3 The Threshold Limit Values for Occupational Exposure to Ultraviolet Radiation Incident Upon Skin or Eye

3. DEFINITIONS

3.1 MATERIAL

A type and grade of plastic, distinguished by its composition, manufacturer's designation (number), and color.

3.2 COATED MATERIAL

A coated material is a material as defined in 3.1 which has a coating applied to the surface of the finished sample to impart some protective properties. Coating identification includes manufacturer's name, formulation designation (number), and recommendations for application.

3.3 APPARATUS

3.3.1 High-intensity Discharge Lamp

A sealed light source that produces light flux by means of an electrical discharge.

3.3.2 Discharge Forward Lighting (DFL) Systems

A lighting system providing forward illumination, comprised of the light discharge source, ballast/ starting system, and interconnecting wiring.

3.3.3 Test Chamber

An aluminum box that provides an alternative to DFL system testing of materials. It is intended to simulate UV intensity and thermal conditions within a DFL device. Refer to Figure 1.

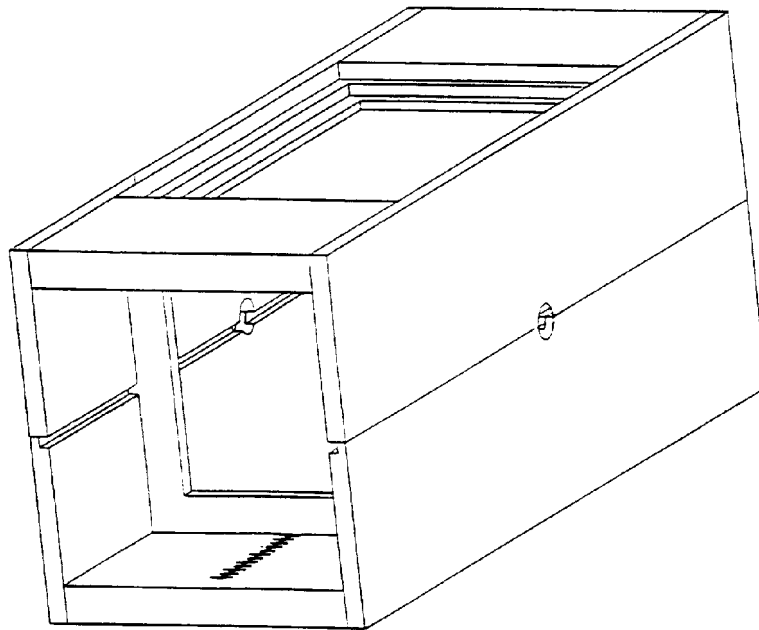


Figure 1 - SAE HID Test Chamber - Assembled - Full Scale

3.3.3.1 Test Chamber Design

The test chamber design is given in Figures 2, 3, 4, and 5. The ability of the chamber to simulate device environments is limited to distances "d" of 44 to 64 mm. It is made of clear anodized 3.2 mm thick aluminum. The assembled test chamber is tight fitting, but not hermetically sealed. The lamp is mounted in compliance with the manufacturer's recommendations and positioned so that the arc discharge coincides with the geometric center of the test chamber. Sample holders are placed a distance "d" from center, on opposite sides of the lamp. The distance "d" determines the UV intensity at the sample. It is nominally twice the focal length of the intended DFL system. There are two sample holders. One sample holder contains Borosilicate glass and the other contains the material to be tested. A 38 mm x 76 mm Borosilicate glass window is built into the top of the test chamber to allow the escape of excess thermal radiation. For $d < 50$ mm, the window should be covered with an aluminum plate. Thermal equilibrium is reached in an open air environment.

At its discretion, the manufacturer may perform the recommended tests using the actual DFL system rather than the test chamber.