



SURFACE VEHICLE RECOMMENDED PRACTICE

J576™

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Superseding J576 AUG2017

(R) Materials for Use in Optical Parts Such as Lenses and
Reflex Reflectors of Motor Vehicle Lighting Devices

RATIONALE

With the emergence of front decorative lamps, the weathering test methods and requirements of this standard necessitate updating. SAE J3098 references SAE J576, but there is a need to screen new technologies more quickly for decorative applications, which do not serve a safety function. A guide for artificial accelerated weathering, which applies to decorative lighting only, is now included in this standard. The recommended test procedure is based on methods previously established for SAE J3086, which simulates 3-year outdoor weathering. The Heat Test, which must be conducted on all materials according to FMVSS108, is now included in this standard as well.

Sample or samples are now specified as material(s). ASTM D4364 has been replaced by the equivalent SAE J1961 method and exposure durations are now defined. A minimum specimen width is now recommended to ensure the specimen is large enough to be measured with a 25-mm diameter aperture. The geographic Florida and Arizona exposure site locations are more clearly defined. The requirement to add an optical brightener to the coating has been deleted since this is not practical or necessary. A recommended method for protected inner lens testing is included. The color requirements for before and after exposure are more clearly defined. Unexposed controls are now unexposed file specimen(s) to reflect the ASTM definition for controls that are not tested. A rating scale has been included to evaluate if surface defects on exposed specimens are significant enough to affect performance from an appearance standpoint.

1. SCOPE

This SAE Recommended Practice is intended as a guide toward standard practice and is subject to change to keep pace with experience and technical advances. This document establishes additional performance requirements and provides test methods and requirements to evaluate the suitability of materials intended for optical applications in motor vehicles. The tests are intended to determine physical and optical characteristics of the materials only. 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. Glass and materials inclusive to the light source are not in scope for this method.

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.

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2.1.1 SAE Publications

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

SAE J578	Chromaticity Requirements for Ground Vehicle Lamps and Lighting Equipment
SAE J1961	Accelerated Exposure of Automotive Exterior Materials Using a Solar Fresnel Reflector Apparatus
SAE J2527	Performance Based Standard for Accelerated Exposure of Automotive Exterior Materials Using a Controlled Irradiance Xenon-Arc Apparatus
SAE J3086	Performance Classification of Headlamp Outer Lenses
SAE J3098	Front Decorative Lamp

2.1.2 Code of Federal Regulations (CFR) Publications

Copies of these documents are available online at www.ecfr.gov.

49 CFR 571.108 Lamps, Reflective Devices and Associated Equipment (FMVSS 108)

2.1.3 Transport Canada Publications

Available from Transport Canada, Tower C, Place de Ville, 330 Sparks Street, Ottawa, Ontario K1A 0N5, Canada, Tel: 1-888-830-4911, www.tc.canada.ca.

Canada Motor Vehicle Safety Standard (CMVSS) 108 Lighting Systems and Reflective Devices

2.1.4 CIE Publications

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

CIE 015	Colorimetry, 4th Edition
CIE 1931	Colour-Matching Functions, 2 Degree Observer

2.1.5 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9500, www.astm.org.

ASTM D1003	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
ASTM E308	Standard Practice for Computing the Colors of Objects by Using the CIE System

3. DEFINITIONS

3.1 COATED MATERIAL(S)

Material(s) as defined in 3.11 which has a coating applied to the surface of the finished specimen to impart some protective properties. Coating identification includes producer's name and formulation designation code.

3.2 COLOR

The color of light is specified as the chromaticity coordinates according to the CIE 1931 standard colorimetric system as defined by SAE J578. The color transmitted through the material(s) shall fall within the chromaticity coordinate boundaries as defined by SAE J578 when either:

- a. Illuminated using a standard illuminant, e.g., Illuminant A, for applications with incandescent or tungsten-halogen light sources.
- b. Illuminated using the application-specific light source illuminant, e.g., one or more LEDs having a narrow emission spectrum and provided with defined luminous flux and spectral emission data.

3.3 COLOR BLEEDING

The migration of color out of a material onto the surrounding surface.

3.4 CRACKING

A separation of adjacent sections of a material with penetration partly or fully through the specimen.

3.5 CRAZING

A network of apparent fine cracks on the surface of the material.

3.6 DECORATIVE LAMP MATERIAL(S)

Material(s) used for SAE J3098 decorative lamp applications. These materials may be transparent or diffusing; with or without coating.

3.7 DELAMINATION

Separation of the layers of a material including coatings.

3.8 DIFFUSING MATERIAL(S)

Material(s) that intentionally scatters transmitted light to specific intended levels and, for the purpose of this standard, has an initial (unexposed) haze value greater than 30% when measured in accordance with ASTM D1003.

3.9 EXPOSED

Material(s) used in lenses or optical devices exposed to direct sunlight as installed on the vehicle.

3.10 HAZE

The cloudy or turbid appearance of originally transparent material(s) caused by physical degradation of the material(s) due to any of a variety of factors, including natural environmental conditions. Haze is evaluated by measuring the amount of light scattered in a cone angle greater than 2.5 degrees from normal versus the total luminous transmittance as measured by the procedures in ASTM D1003. Total luminous transmittance in this case includes the light not scattered, the light scattered less than 5 degrees, and the light scattered more than 5 degrees.

3.11 MATERIAL(S)

The type and grade of material composition with the producer's designated code used in automotive lamp applications. Material(s) can reference a single material, coated or uncoated, or a combination of materials tested together.