



SURFACE VEHICLE RECOMMENDED PRACTICE

J1967™

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(R) Retroreflective Materials for Vehicle Conspicuity

RATIONALE

Document changes:

Section 1 and 1.1: Changed “retroreflective materials” and “conspicuity materials” to “retroreflective sheeting materials.”

2.1.1: Added SAE J387 and SAE J2041. Removed SAE J576.

2.1.2: Removed ASTM B117. Added ASTM D4956. Revised ASTM specification reference format so that there is no dash between letter and number (e.g., D4956 instead of D-4956), which is consistent with current ASTM practices.

2.1.3: Revised USGPO address.

2.1.4: Added Canadian publications.

2.2.1: Removed the specific year of ASTM B117. Removed ASTM G152 and G153. Added ASTM E811, G7, G147, G151, and G155. Revised ASTM specification reference format so that there is no dash between letter and number (e.g., D4956 instead of D-4956), which is consistent with current ASTM practices. Corrected ASTM E1347 title.

2.2.2: Removed government publications DOT-HS-806-098 and DOT-HS-807-815, as these documents were no longer readily available. Changed to United Nations Publication with UN organization information reference, added UN Regulation No. 104.

2.2.3: Removed “Austin & Forester; Visibility Characteristics of Large Vehicle Conspicuity Marking, October, 1988 (unpublished).” Changed section to CIE publications and added CIE organization information.

2.2.4: Added ISO publications section with ISO organization information reference. Added ISO 4892-2.

Section 3: Removed “CFR,” “daytime,” “graphics,” “passive devices,” “nighttime,” and “reflectance factor” definitions, as these definitions were either unnecessary or not used in the document. Added “coefficient of retroreflection” and “retroreflective sheeting.”

4.1: Revised wording to make more consistent with other SAE documents. Revised the conspicuity materials applications and SAE codes text into a table, labeled as Table 1.

Added 5.1 and 6.1 to coincide with FMVSS 108 application pattern and marking requirements for truck and trailer applications.

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Sections 5 and 6: Reorganized test and requirements to group coefficient of retroreflection (5.2 and 6.2) with color (5.3 and 6.3), SAE J2139 physical tests (corrosion, 5.4.1/6.4.1; moisture intrusion, 5.4.2/6.4.2), and ASTM D4956 tests (weathering, 5.6.1/6.6.1; impact, 5.6.2/6.6.2; adhesion, 5.6.3/6.6.3). Revised sample sizes since impractical to use original 200 x 200 mm for all listed tests.

Table 1 changed to Table 2. Split the “FMVSS Marking and SAE Code” column into two columns: “SAE Code” and “FMVSS Marking.”

Table 2 changed to Table 3. Split the “FMVSS Marking and SAE Code” column into two columns: “SAE Code” and “Sheeting Type.”

Table 3 changed to Table 4. Revised color boundary coordinates from “x/y” format to “(x, y)” format. Changed daytime color and luminance requirements to match current ASTM D4956 requirements, which are based on an Illuminant D65 source instead of the previous Illuminant C source.

Added 5.3.2 and 6.3.2 tests and requirements, along with Table 5.

Renamed 5.4.1 and 5.4.3 to make consistent with SAE J2139.

5.6: Changed SAE J576 outdoor weathering and an outdated ASTM D4956 carbon-arc artificial weathering to current ASTM D4956 weathering methodologies. The new test is a 36 month outdoor exposure with an allowance for an interim 2000 hour xenon artificial accelerated weathering test, which is consistent with current ASTM D4956 practices.

6.4.2: Added post-retroreflection and color tests to moisture intrusion test since the standard SAE J2139 requirement of measuring accumulated water or observing bubbles from a submersed device is not practical for retroreflective sheeting material.

1. SCOPE

This SAE Recommended Practice applies to retroreflective sheeting materials that are used on truck tractors and trailers 2032 mm or more in overall width and with a gross vehicle weight rating (GVWR) over 4536 kg and school buses to improve vehicle conspicuity. The retroreflective sheeting materials for the truck tractors and trailers are super-high-intensity materials containing micropisms. The retroreflective sheeting materials for school buses may contain flexible non-exposed glass bead lenses or micropisms.

1.1 Purpose

This document establishes test procedures and related requirements for identifying and evaluating retroreflective materials intended for use in passive devices used to enhance the conspicuity of vehicles at nighttime.

Retroreflective sheeting materials meeting the requirements of this document are intended to be in compliance with Code of Federal Regulations Title 49 Part 571.108, otherwise referred to as FMVSS 108, which references ASTM D4956 Type V materials. The specifications in this document are not intended to apply to materials used for commercial identification, advertising, or similar graphics. Their use is outside the scope of this document. School bus retroreflective materials specified in this document are intended to comply with the requirements of FMVSS 217 (49 CFR 571.217) and FMVSS 131 (49 CFR 571.131).

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 J387	Terminology - Motor Vehicle Lighting
SAE J759	Lighting Identification Code
SAE J2041	Reflex Reflectors for Use on Vehicles 2032 mm or More in Overall Width
SAE J2139	Tests for Signal and Marking Devices Used on Vehicles 2032 mm or More in Overall Width

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 D4956	Standard Specification for Retroreflective Sheeting for Traffic Control
ASTM E810	Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Geometry

2.1.3 FMVSS Publications

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

49 CFR 571.108	Lamps, Reflective Devices, and Associated Equipment
49 CFR 571.131	School Bus Pedestrian Safety Devices
49 CFR 571.217	Bus Emergency Exits and Window Retention and Release

2.1.4 Canadian Publications

Available from Transport Canada, Motor Vehicle Standards and Research Branch Safety Directorate, 330 Sparks Street, Ottawa, Ontario K1A 0N5, Canada, Tel: +1-613-990-2309 or +1-800-333-0371, www.tc.gc.ca.

CMVSS 108	Canada Motor Vehicle Safety Act and Regulations Standard – Section 108
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Technical Standards Document No. 108