

Gaseous Discharge Warning Lamp for Authorized Emergency, Maintenance, and Service Vehicles

1. Scope—This SAE Recommended Practice provides test procedures, requirements, and guidelines for single-color Gaseous Discharge Warning Lamps.

1.1 Rationale—This document has been superseded by the lighting technology independent documents SAE J595 “Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles” and SAE J845 “Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles” which should now be used for the evaluation of single color gaseous discharge warning lamps in place of SAE J1318.

2. References

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale PA 15096-0001.

SAE J575—Tests for Motor Vehicle Lighting Devices and Components

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

SAE J578—Color Specification for Electric Signal Lighting Devices

SAE J759—Lighting Identification Code

2.2 Related Publications—The following publications are provided for information purposes only and are not a required part of the document.

2.2.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale PA 15096-0001.

SAE J595—Flashing Warning Lamps for Authorized Emergency, Maintenance, and Service Vehicles

SAE J845—360 Degrees Warning Lamp for Authorized Emergency, Maintenance, and Service Vehicles

2.2.2 ISO PUBLICATION—Available from the ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 4148—Road vehicles—Special warning lights—Dimensions (1978)

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2.2.3 NBS PUBLICATIONS—Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

National Bureau of Standards No. 480-3 (June 1977)—Sirens and Emergency Warning Lights
 National Bureau of Standards, Special Publication No. 480-16—Emergency Vehicle Warning Lamps, State of the Art
 National Bureau of Standards No. 480-36 (July 1979)—Some Psychophysical Tests of the Conspicuity of Emergency Vehicle Warning Lights
 National Bureau of Standards No. 480-37 (May 1981)—Emergency Vehicle Warning Systems

3. Definitions

3.1 **Light Pulse**—A sudden emission of light of short duration and high intensity.

3.2 **Light Flash**—A single light pulse or a train of pulses. In order for a train of pulses to be considered, a distinct flash the time between adjacent pulses within the train must not exceed 100 ms. If the time separation between adjacent pulses exceeds 100 ms, the pulses must be considered to be parts of two separate flashes. Light pulses with peak luminous intensities less than 10% of the preceding light pulse peak shall be ignored when determining flash type.

3.3 **Flash Cycle**—A sequence of light flashes and dark intervals which, with regular repetition, constitutes the complete output cycle of a flashing lamp. For a single pulse/single flash lamp, the full cycle consists of a single on-off sequence. For a multiple pulse/single flash lamp, the full cycle consists of two or more light pulses followed by a dark interval that is not less than half the flash cycle. For a multiple flash lamp, the full cycle consists of two or more light flashes followed by a dark interval that is not less than half the flash cycle.

3.4 **Gaseous Discharge Warning Lamp**—A device that produces a regularly repeating pattern of light flashes when electrical current is discharged periodically through an ionized gas.

3.5 **360 Degrees Warning Lamp**—A lamp that projects a light in a horizontal 360-degrees arc. It will appear to project a regularly repeating pattern of flashes to an observer positioned at a fixed location. Its function is to inform other highway users to stop, yield right-of-way, or to indicate the existence of a hazardous situation.

3.6 **Directional Warning Lamp**—A lamp that produces a repetitive flash of light which is directionally aimed and will project a flashing beam signal over a minimum area from 20 degrees right to 20 degrees left on a horizontal plane and from 10 degrees up to 10 degrees down on a vertical plane.

3.7 **Primary Warning Lamps**—Lamps or groups of lamps that are intended to provide the primary visual warning signal as called out in each service class. Unless prohibited by law or regulation, a class 1 device may be used in place of a class 2 device and a class 1 or 2 device in place of a class 3 device.

3.8 **Secondary Warning Lamps**—Lamps or groups of lamps that can be used to provide a supplemental warning signal for each service class.

3.9 **Class 1 Warning Lamps**—Primary Warning Lamps for use on authorized emergency vehicles responding to emergency situations. These lamps are utilized to capture the attention of motorists and pedestrians and to warn of a potentially hazardous activity or situation. The photometric performance of these lamps is specified in Tables 1 and 2 or Tables 3 and 4.

3.10 **Class 2 Warning Lamps**—Primary Warning Lamps for use on authorized maintenance and service vehicles to warn of traffic hazards such as an accident, slow-moving service truck, etc. The photometric performance of these lamps is specified in Tables 5 and 6.

3.11 Class 3 Warning Lamps—Primary Warning Lamps for use on vehicles that are authorized to display flashing warning lamps for identification only. The photometric performance of these lamps is specified in Tables 7 and 8.

3.12 Flash Energy—Flash Energy is the total luminous energy per unit solid angle contained in the entire flash in candela seconds.

$$\text{candela second} = \int_{t_1}^{t_2} I dt \quad (\text{Eq. 1})$$

where:

I = Instantaneous intensity (candela)

t_1 = Time at start of flash (seconds)

t_2 = Time at end of flash (seconds)

3.13 Light Center—The light center of a gaseous discharge warning lamp is the geometric center of the light emitting element (arc or light source) of the lamp.

4. *Lighting Identification Code*

4.1 Gaseous discharge warning lamps may be identified in accordance with SAE J759, by the codes:

360-degrees gaseous discharge lamps

(W5-1) - Class 1

(W5-2) - Class 2

(W5-3) - Class 3

Directional gaseous discharge lamps

(W5) -

5. Tests—In all instances where a device is required to be operated during a test specified in this report, the voltage applied to the input wires or terminals of the device shall be 12.8 V for nominal 12 V electrical systems and 25.6 V for nominal 24 V electrical systems. Devices designed for voltages other than 12 VDC and 24 VDC shall be tested at their design voltage.

5.1 SAE J575—SAE J575 is a part of this report.

The following tests are applicable with modifications as indicated:

5.1.1 VIBRATION TEST

5.1.2 MOISTURE TEST

5.1.3 DUST TEST

5.1.4 CORROSION TEST

5.1.5 PHOTOMETRY—In addition to the photometric test procedures in SAE J575, the following apply:

5.1.5.1 The device shall be allowed to operate for 15 minutes prior to making photometric measurements.