Technical Report Preprint

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J594d

REFLEX REFLECTORS — SAE J594d

SAE Standard

Report of Lighting Division approved January 1931 and last revised by Lighting Committee March 1967.

Definition—Reflex reflectors, for the purpose of this specification, include only devices which are used on vehicles to give an indication to an approaching driver by reflected light from the lamps on the approaching vehicle. Reflex reflectors should be visible at night from all distances between 100 and 600 ft when illuminated by the lower beam.

The following sections from SAE J575 are a part of this standard.

Section B—Samples for Test

Section D—Laboratory Facilities

Section E—Vibration Test

Section F—Moisture Test—Except that in the case of sealed units there shall be no visible moisture within the unit.

Section G—Dust Test

Section H—Corrosion Test

Section I—Color Test—The test sample may be either the reflex reflector or a disc of the same material, technique of fabrication, and dye formulation as the reflex reflector. If a disc is used, the thickness should be twice the thickness of the reflector as measured from the face of the lens to the apexes of the reflecting elements.

Section J—Photometry—The reflex reflector shall be set up for testing as shown in Fig. 1. The test distance shall be 100 ft. The source of illumination shall be a lamp with a 2 in. effective diameter and with a filament operating at 2854K color temperature. The observation point shall be located directly above the source of illumination. The reflex reflector shall be mounted on a goniometer with the center of the reflex area at the center of rotation and at the same horizontal level as the source of illumination. The axis of the reflex reflector shall be taken as parallel to the longitudinal axis of the vehicle.

Photometric measurements of reflex reflectors shall be made at various observation angles and entrance angles as shown in Table 1. The observation angle is the angle formed by a line from the observation point to the center of the reflector and a second line from center of the reflector to the source of illumination. The entrance angle is the angle between the axis of the reflex reflector and a line from the center of the reflector to the source of illumination. The entrance angle shall be designated left, right, up, and down in accordance with the position of the source of illumination with respect to the axis of the reflex reflector as viewed from behind the reflector.

Photometric measurements may be made visually or photoelectrically. With either method, the candlepower which the reflex reflector is projecting toward the observation point shall be determined. Also, the illumination on the reflex reflector from the source of illumination shall be measured in footcandles. The recorded measurement of each test point is the quotient of the projected candlepower divided by the footcandle illumination. Reflex reflectors may have any linear or area dimensions; but, for the photometric test a maximum area of 12 sq in. contained within a 7 in. diameter circle shall be exposed.

TABLE 1—MINIMUM CANDLEPOWER PER INCIDENT FOOT-CANDLE FOR CLASS A RED REFLEX REFLECTOR[a]

Observation Angle, deg	Entrance Angles, deg				
	0	10 Up	10 Down	20 Left	20 Right
0.2	4.5	3.0	3.0	1.5	1.5
1.5	0.07	0.05	0.05	0.03	0.03

[a] Amber values shall be 2.5 times indicated red values and white values shall be 4 times indicated red values.

In making visual measurements, a comparison lamp, emitting red light similar in spectral quality to the reflex reflector, shall be located adjacent to the reflector (at an angle not to exceed ½ deg) and arranged so that the observer can readily vary the candlepower from 0.01 to 0.25 to make the intensity duplicate that of the reflex reflector under test. To bring the candlepower of the reflex reflector into the range of the calibrated standard, means shall be provided to change the intensity of the source of illumination without changing the filament color temperature. The comparison lamp shall be designed to avoid reflection from the source of illumination back in the direction of the observer. Also, it shall be of such size, and so diffused, that when viewed by the observer (if necessary through a 2½ × reducing monocular), the candlepower can be readily compared and adjusted to that of the reflex reflector. The observer shall have at least 10 minutes of dark adaptation before making observations.

In making photoelectric measurements, the opening to the photocell shall not be more than ½ in. vertical by 1 in. horizontal, with the observation point above the source of illumination.

Reflex reflectors, which do not have a fixed rotational position on the vehicle, shall be rotated about their axes through 360 deg to find the

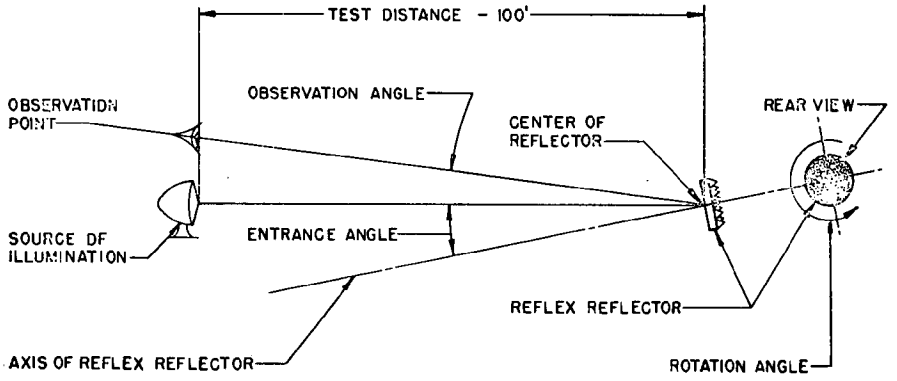

FIG. 1—SETUP FOR TESTING