SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

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Headlamp Cleaners

RATIONALE

The SAE standards are to be revised on a regular basis to be kept in line with the progress of technique. The recently introduced AFS systems make it necessary to modify the way to check the efficacy of the cleaner by adapting the position of the measuring points.

The dirt deposited on the lenses results in both reducing the illumination of the road ahead of the vehicle and increasing the glare to other road users. In wintertime, it is not uncommon to lose 50% of the light produced by the lamps after just a few miles of driving because of accumulated dirt. Cleaners are easy to use, and allow an instant recovery of lighting efficacy. Cleaners are often installed on headlamps, but they can also improve the efficacy of other devices like front foglamps or DRLs.

1. SCOPE

This SAE Recommended Practice provides test procedures, performance requirements, and guidelines for cleaners intended for use on motor vehicles.

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 J387 Terminology - Motor Vehicle Lighting

SAE J575 Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less than 2032 mm in Overall Width

SAE J759 Lighting Identification Code

SAE J1383 Performance Requirements for Replaceable Bulb Motor Vehicle Headlamps

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2.1.2 Related Publication

The following publication is provided for information purposes only and is not a required part of this SAE Technical Report.

2.1.2.1 ISO Publication

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 3267–1975(e) Road vehicles—Headlamp cleaners

2.1.3 Other Publications

ECE R45-01

Japanese Type Designation Enforcement Procedures for Devices, Article 32 Attachment 55 (MLIT Announcement 619/2002) and TRIAS 56-2003

National Standard of the People's Republic of China GB 21260-2007

Standards of India AIS-034 and AIS-083

Brazilian CONTRAN 227-2007 § 4.3.9

3. DEFINITIONS

3.1 HEADLAMP CLEANER

A complete device with whereby the exterior light emitting surface of a lowbeam and/or other road illuminating devices can be cleaned. Examples of common types are:

a. Headlamp cleaner with brushes or wipers used to spread cleaning fluid over the lens surface and to remove dirt.

b. Headlamp cleaner with nozzles to spread cleaning fluid over the lens surface.

3.2 FLUID CONTAINER

The part of the headlamp cleaner in which the cleaning fluid may be stored.

3.3 CLEANING PERIOD

The period of time necessary for any specified requirements to be met. This includes any pretreatment period.

3.4 CLEANING FLUID

The commercially available washer liquid recommended for use in conjunction with a headlamp cleaner.

3.5 CLEANING EFFICIENCY

The percentage of the intensity of lamp illumination measured at specific test point(s) after cleaning with respect to the values measured at those same test point(s) on the same clean headlamp.

3.6 TEST MIXTURE

A mixture of water and polluting agent to be applied to the headlamp outer lens for testing it.

4. IDENTIFICATION CODE

Headlamp cleaners shall be marked in accordance with SAE J759—Lighting Identification Code with HC. This designation may be placed on the fluid container, the fluid container cap, or at any other location where it can be easily read.

5. TESTS

5.1 Test Facilities and Environment

5.1.1 Testing shall be carried out in an ambient temperature of 23 °C ± 5 °C.

5.1.2 Electrically-operated cleaners shall be operated at the design voltage, as specified by the manufacturer, with a tolerance of ±0.2 V.

5.1.3 In pneumatic systems, the air pressure used to operate the headlamp cleaner shall be as specified by the manufacturer.

5.2 Equipment

5.2.1 Test Fixture

The headlamp(s) and headlamp cleaner shall be mounted in a test fixture reproducing the mounting attitude in the vehicle, including the position of one component relative to the other, and providing the conditions necessary for normal operation of the headlamps and the cleaner.

5.2.2 Test Mixture

It shall be applied to the lamp exterior lens.

5.2.2.1 For all lamps with the outer lens in plastic material, the mixture of water and polluting agent shall consist of:

a. 9 parts by weight of silica sand with a particle size of 0 to 100 µm corresponding to distribution shown in Table 1. (An example of such is sand W8 from Quartzwerke Gmbh, D-50226 Frechen, Germany.)

b. 1 part by weight of vegetable carbon dust (beech wood - charcoal) with a particle size of 0 to 100 µm.

c. 0.2 parts by weight of Na CMC. (Na CMC represents the sodium salt of laboratory grade carboxymethylcellulose customarily referred to as CMC.) The Na CMC used in this mixture shall have a degree of substitution (DS) of 0.6 to 0.7 and a viscosity of 200 to 300 cP for a 2% solution at 20 °C.

d. 5 parts by weight of sodium chloride (pure at 99%).

e. 13 parts by weight of distilled water with conductivity smaller than 10 µSiemens/cm (deionized water)

f. 2 ± 1 parts by weight of surfactant (detergent)

5.2.2.2 For all lamps with the outer lens in glass material, the mixture of water and polluting agent shall consist of:

a. 9 parts by weight of silica sand with a particle size of 0 to 100 µm corresponding to distribution shown in Table 1. (An example of such is sand W8 from Quartzwerke Gmbh, D-50226 Frechen, Germany. There is no current source in the United States or Canada.)

b. 1 part by weight of vegetable carbon dust (beechwood - charcoal) with a particle size of 0 to 100 µm.

c. 0.2 parts by weight of Na CMC. (Na CMC represents the sodium salt of laboratory grade carboxymethylcellulose customarily referred to as CMC.) The Na CMC used in this mixture shall have a degree of substitution (DS) of 0.6 to 0.7 and a viscosity of 200 to 300 cP for a 2% solution at 20 °C.

d. An appropriate quantity of distilled water with a conductivity smaller than 10 µSiemens/cm (deionized water).

5.2.2.3 The mixture shall be fit for applying to the lamp by a spray gun or by brush. The mixture shall not be used more than 24 h after preparation. If applied by spray, the mixture shall be loaded into the gun less than 1 h before application.

5.2.2.4 Particle-size distribution

TABLE 1 PARTICLES SIZE DISTRIBUTION

Particle Size (µm)	Particle Size Distribution (%)
0 – 5	12 ± 2
5 – 10	12 ± 3
10 – 20	14 ± 3
20 – 40	23 ± 3
40 – 80	30 ± 3
80 – 100	9 ± 3

5.3 Test Procedures

In addition to the test procedures in SAE J575 JUN2007, the following applies:

Photometric tests shall be made with the photometer at a distance of at least 18.3 m from the headlamp lens, or at least 3 m from the DRL lamp lens. The H-V axis of any given lighting function shall be taken as the horizontal and vertical planes passing, at the choice of the manufacturer of the cleaning device:

- through the center of the light source of that lighting function, or
- through the geometric centroid of the effective light-emitting surface of that lighting function

when the lamp is in the position that corresponds to driving on a straight road in forward motion. If the headlamp cleaner mounts in front of, or on the effective light emitting surface and if it is intended for OEM applications, the photometric performance of each headlamp shall be measured first without the cleaner installed and then with the cleaner installed in its parked or normally “off” position. The device with cleaner is to be fixed throughout the environmental tests on a fixture that can be accurately relocated on the goniometer.

NOTE: A lamp re-aim of ±0.25 degree is permitted after the environmental tests.

5.3.1 Cleaning Test for Device with Cleaners

5.3.1.1 The initial illumination shall be measured according to 6.1.1 when the lamp is clean. After the device has been operated for 10 min, the dirt mixture shall be applied evenly to the entire lens surface using a spray gun or a brush. The mixture shall then be dried either by operating the device or using hot air. Repeat this procedure, if necessary, until the luminous intensity at each measured point in Table 2 has been reduced to between 20% and 10% of the initially measured value(s).