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Road vehicles — Headlamp cleaners

Véhicules routiers — Dispositifs de nettoyage des projecteurs

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ISO 3267:1991

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3267 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Sub-Committee SC 8, *Lighting and signalling*.

This second edition cancels and replaces the first edition (ISO 3267:1975), of which it constitutes a technical revision.

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Road vehicles — Headlamp cleaners

1 Scope

This International Standard specifies the characteristics of headlamp cleaners for road vehicles.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 headlamp cleaner: Complete device with which all or part of the light-emitting surface of a headlamp can be cleaned.

2.2 fluid container: That part of the headlamp cleaner in which the cleaning fluid is stored, as appropriate.

2.3 cleaning period: Period of time necessary to meet the requirements specified in clause 4, including any pretreatment period.

2.4 cleaning efficiency: Percentage of the illumination measured at the measuring points after cleaning by comparison with the values measured with the headlamp totally clean.

NOTE 1 Terms "lamp", "dipped-beam" and "main-beam" are in accordance with ISO 7227:1987, *Road vehicles — Lighting and light signalling devices — Vocabulary*.

3 General specifications

3.1 The headlamp cleaner shall be designed to operate at temperatures between $-10\text{ }^{\circ}\text{C}$ and $+35\text{ }^{\circ}\text{C}$ and at speeds between 0 and 130 km/h or the maximum speed of the vehicle if it is less than 130 km/h. These requirements do not apply if the cleaner is blocked by ice or snow. A temporary failure due to freezing or deposits of snow shall not be considered as a failure, provided that the device can be made to work again by simple means.

3.2 The headlamp cleaner shall be designed to retain its efficiency despite vibrations to which it may be subjected on the vehicle.

3.3 The headlamp cleaner shall not be functionally damaged by water, ice or snow accumulating on it during normal vehicle use, or if the cleaning fluid is frozen. Nor shall it be functionally damaged if it is exposed to temperatures of $-35\text{ }^{\circ}\text{C}$ and $+80\text{ }^{\circ}\text{C}$, both for 1 h.

3.4 The capacity of the fluid container shall be sufficient for at least 50 cleaning periods (see 2.3) for headlamp cleaners of "capacity class 50" and at least 25 cleaning periods for headlamp cleaners of "capacity class 25". If the fluid container supplies not only the headlamp cleaner but also the windscreen washer and the rear window washer, this capacity shall be increased by 1 l in all. It shall be easy to check the fluid level and the filling orifice shall be readily accessible.

3.5 All elements which may come in contact with the cleaning fluid shall be resistant against a mixture consisting of 50 % methyl alcohol, ethyl alcohol or isopropyl alcohol, and 50 % water.

3.6 If parts of the headlamp cleaner in the rest position(s) are on the headlamps' light-transmitting surface, the photometric values of the headlamps, measured at the points listed in the appropriate Regulation, for which minimum values are specified, shall not be reduced by more than 5 % in any normal rest position(s) of those parts, with respect to those values measured before installation of the headlamp cleaner; in no case shall these values be less than those prescribed in the Regulation in question.

This requirement does not apply when the headlamp and the parts of the headlamp cleaner have been approved as a complete assembly.

During operation, except in the rest position, the mechanical parts shall not cover more than 20 % of the light-transmitting surface of a dipped-beam

lamp, nor more than 10 % of the light-transmitting surface of a main-beam lamp which is not integral with the dipped-beam lamp.

3.7 Parts of the headlamp cleaner which, in the rest position or during operation, form part of the external surface of the vehicle, shall meet the requirements in 3.7.1 to 3.7.4.

3.7.1 The parts shall not exhibit, directed outwards, any pointed or sharp parts or any projections of such shape, dimensions, direction or hardness as to be likely to increase the severity of bodily injury to a person hit or brushed by the bodywork.

3.7.2 No protruding part on the external surface shall have a radius of curvature of less than 2,5 mm; this does not apply to parts of a hardness not exceeding Shore hardness A/60.

3.7.3 In cases where the cleaner comprises a wiper, the requirements in 3.7.1 and 3.7.2 do not apply to the wiper blades or their supporting members. However, these units shall be so made that they have no sharp angles or pointed or cutting parts of a non-functional nature. Any wiper shaft shall be fitted with a protective casing having a radius of curvature of not less than 2,5 mm and an area of not less than 50 mm².

3.7.4 In cases where the cleaner comprises a nozzle(s), 3.7.2 shall apply neither to the functional parts of the nozzle(s) nor to the non-functional parts if they protrude less than 5 mm.

3.8 The requirements of 3.7 shall not apply to those parts of the headlamp cleaner which are located so that, in static conditions, they cannot be contacted by a sphere of 100 mm in diameter.

3.9 The headlamp cleaner, or any part of it, shall not prevent the aiming of the headlamp and the mounting and replacement of the headlamp or bulb. If necessary, the headlamp cleaner or parts of it may be detachable, if they can be removed with simple tools.

3.10 The headlamp cleaner shall be designed to retain its efficiency if the vertical alignment of the headlamp may vary owing to the vehicle being fitted with a headlamp levelling system.

4 Photometric requirements

4.1 Cleaner efficiency

Test the headlamp cleaner efficiency in accordance with clause 5. The cleaning efficiency at the measuring points given below (see figure 1) shall, after every cleaning period, reach at least 70 % for both dipped-beam and main-beam.

a) Measuring points for dipped-beam headlamp:

- 1) where the headlamp is for dipped-beam only, the measuring points are 50 R (L)¹⁾ and 50 V.
- 2) where the headlamp is used for both dipped-beam and main-beam, the measuring point is 50 R (L)¹⁾.

b) Measuring point for main-beam headlamp: the measuring point is HV.

NOTE 2 Where there are separate optical systems for the main-beam and dipped-beam that use the same lens, both a) 1) and b) apply.

4.2 Measuring point location

The measuring points are located as shown in figure 1 on a screen 25 m in front of the headlamp.

The screen shall be positioned such that its plane is perpendicular to the headlamp axis.

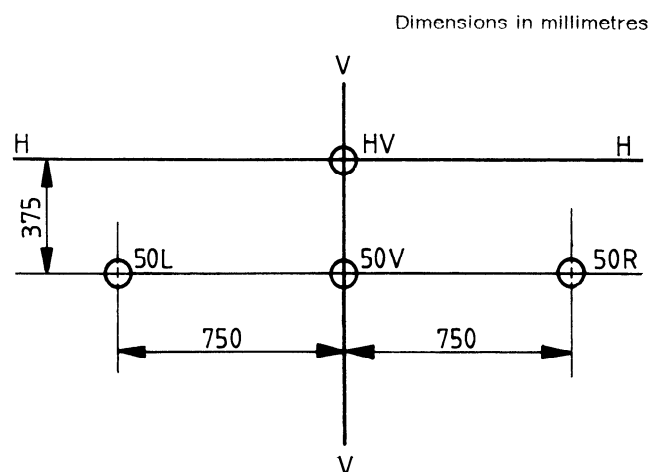


Figure 1

1) "R" refers to countries where traffic drives on the right side of the road; "L" refers to countries where traffic drives on the left side of the road.

5 Test procedure

5.1 General

Carry out the test in still air at an ambient temperature of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

If the manufacturer of the headlamp cleaner intends to provide several positions of the cleaning device with respect to the headlamps, only the headlamp in the most unfavourable position in relation to the cleaning device need be tested. To determine the fluid consumption, both the nozzle(s) for the right-hand and left-hand headlamps shall be used.

5.2 Test equipment and materials

5.2.1 The mixture of water and dirt to be applied to the headlamp consists of

nine parts by mass of silica sand with a particle size of 0 to 100 μm corresponding to the distribution reproduced in table 1,

one part by mass of vegetable carbon dust (beechwood) with a particle size of 0 to 100 μm ,

0,2 parts by mass of NaCMC, where NaCMC indicates the sodium salt of carboxymethylcellulose, currently referred to as CMC; the CMC to be used in the dirt mixture shall have a degree of substitution of 0,6 to 0,7 and a viscosity of 200 cP to 300 cP at 20 $^{\circ}\text{C}$ for a 2 % solution,

an appropriate quantity of water with conductivity less than or equal to 10 $\mu\text{S}/\text{m}$.

The mixture shall be fit for application to the headlamp by means of the spray-gun specified in 5.2.3. The mixture shall be used not earlier than 2 h and

not later than 24 h after preparation. It shall be loaded into the spray-gun immediately before use.

5.2.2 The light-measuring equipment shall be equivalent to that used in connection with the approval of the headlamp(s) in question.

5.2.3 A power supply of sufficient capacity (the voltage drop during the cleaning period shall not exceed 1 %), a voltmeter for short time measurements (oscilloscope), a spray-gun at an operating pressure of about 500 kPa with a flow cup and a nozzle of 1,5 mm diameter are needed.

5.2.4 If not tested on the vehicle, mount the headlamp(s) and cleaner on a test fixture simulating vehicle mounting and providing conditions necessary for normal cleaner and headlamp(s) operation.

5.2.5 When testing electrically operated headlamp cleaners, adjust the power supply such that the voltage under load at the terminals of the largest consumer is 13 V in the case of 12 V system and 27 V in the case of 24 V systems.

5.3 Photometric measurement of headlamp when clean

Ensure that the light-emitting surface of the headlamp is clean and the headlamp cleaner stationary. Aim the headlamp appropriately and maintain this aim also for the measurements in 5.4.1 and 5.4.4. Then measure the illumination at the measuring points specified in clause 4.

5.4 Test method for cleaning efficiency

5.4.1 Switch on the headlamp(s) for 10 min. Apply the dirt mixture evenly to the entire light-emitting surface using the spray-gun specified in 5.2.3. Dry the mixture either by operating the headlamp or using hot air. Repeat this procedure if necessary until the illumination has been reduced to less than 20 % of the values measured according to 5.3 at any of the specified measuring points.

After the headlamp has cooled down and not later than 2 h after the dirt coating has dried, switch on the headlamp and operate the headlamp cleaner for the period specified by the manufacturer but not exceeding 10 s.

During the test, the duration of the cleaning period and the mean value of the consumption of cleaning fluid shall be according to the manufacturer's instructions. For headlamp cleaners other than electrically operated, the test conditions shall be specified by the test laboratory in agreement with the manufacturer.

Throughout all stages of this test, take care to avoid thermal shock to the headlamp glass.

Table 1

Particle size μm	Particle size distribution %
0 to 5	12 ± 2
5 to 10	12 ± 3
10 to 20	14 ± 3
20 to 40	23 ± 3
40 to 80	30 ± 3
80 to 100	9 ± 3

NOTE — One example of such sand is sand of type W8 supplied by the company Quarzwerke GmbH, D-5020 FRECHEN, Germany. This information is given for the convenience of users of this international Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

5.4.2 If a fluid is used for the cleaning operation, the test shall be carried out using distilled water with conductivity less than or equal to 10 $\mu\text{S}/\text{m}$.

5.4.3 If the cleaner is designed to be operated manually, carry out the cleaning with a maximum of five operations within the time limit specified in 5.4.1.

5.4.4 After the cleaning operation, allow the headlamp to dry. Again measure the illumination at the measuring points: the values thus obtained shall comply with the requirements specified in clause 4.

If these requirements are not satisfied, it is permitted, in the case of headlamp cleaners using cleaning fluid, to readjust the jet of the fluid to attempt to achieve better results.

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