

Spray reducing devices for heavy goods vehicles —

Part 1: Specification for design of containment devices

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- Freight Transport Association Limited
- Institute of Road Transport Engineers (Incorporated)
- London Transport Executive
- National Bus Company
- National Freight Corporation (NFC) Ltd.
- Road Haulage Association Ltd.
- Society of Motor Manufacturers and Traders Limited

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Aggregate Construction Materials Industries
- British Rubber Manufacturers' Association
- Department of the Environment (Transport and Road Research Laboratory)
- Institute of Petroleum
- Motor Industries Research Association
- Ministry of Defence
- University of Southampton
- Vehicle Builders' and Repairers' Association
- Coopted members

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Foreword

This British Standard has been prepared under the direction of the Automobile Standards Committee at the request of the Department of Transport to specify requirements for devices to control spray from heavy goods vehicles.

The problem of spray is so complex and exacerbated by many factors, that even the fitting of full comprehensive spray reducing devices is unlikely to totally eliminate spray. However, it has been shown that vision from an overtaking vehicle can be significantly improved when spray reduction devices are fitted to heavy goods vehicles. In addition the rearward vision from these vehicles is similarly improved, so that the overtaking vehicle is more visible to the driver.

Spray is generated by the interaction between vehicle tyres and a wet road surface. The density of the spray cloud produced will vary from point to point within the cloud but in general it is dependent on factors such as the depth of surface water, vehicle size and design, speed and the direction and velocity of the wind. It is also affected by road surface design and special pervious road surfaces can help reduce spray. However, these are not viable for general road use at the time of publishing this standard which in any case only covers improvements in vehicle design.

Research has shown that spray only becomes objectionable and significant above 50 mile/h (80 km/h) and that light vehicles travelling at speeds below 70 mile/h (112 km/h) do not normally generate sufficient spray to add to this problem. The problem is caused by spray being generated at such a height and density that visibility is seriously impaired for other road users and the rear vision of the driver of the spray-producing vehicle can also be reduced. Under the worst driving conditions the windscreen wipers cannot in general maintain a clear windscreen so aggravating the problem.

The wheel size and combination of axles of larger goods vehicles, together with their poor aerodynamic performance, make them the most significant spray generators, particularly when travelling at over 50 mile/h (80 km/h). Most work on spray reduction has therefore been directed at this group of vehicles.

Tests have shown that three aspects of vehicle design can have a significant effect in the reduction of spray and these are as follows:

- a) containment around the wheels, i.e. correctly designed wheel guards, valances and wheel flaps;
- b) fitting suppression devices which help prevent surface water thrown up by the tyres forming spray;
- c) paying due regard to the aerodynamic characteristics of vehicles.

Each of these aspects is addressed separately in this standard but it should be recognized that a system using a combination of all three methods is much more likely to be effective than any single type of device.

Whilst this British Standard applies specifically to heavy goods vehicles and their trailers its principles may be used for other vehicles when similar problems occur.

BS AU 200-2a specifies the performance requirements of suppression material and devices, and air/water separating material and devices.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This Part of BS AU 200 specifies requirements for devices which are fitted to motor vehicles and trailers for the purpose of controlling spray which is generated between the vehicle tyres and a wet road surface.

Requirements for containment and suppression devices in the form of “conventional” types of wheel guards with valances and wheel flaps for motor vehicles having a maximum gross mass exceeding 7.5 t, articulated tractor units having a train mass exceeding 7.5 t and trailers having a maximum gross mass exceeding 3.5 t are specified in section 2.

Requirements for containment and suppression devices which may be fitted as alternatives to the devices dealt with in section 2 when conventional types of wheel guards are not used, but the wheels are always covered by the floor of the vehicle body, are specified in section 3. Section 3 applies only to non-steerable rear wheels on single and multiple axles of motor vehicles having a maximum gross mass exceeding 7.5 t and to trailers having a maximum gross mass exceeding 3.5 t.

Alternative requirements for valances and wheel flaps for use on the containment devices dealt with in section 2 for the types of vehicle referred to in that section are specified in section 4.

NOTE 1 Appendix A contains general comment relating to aerodynamic styling.

NOTE 2 The title of the publication referred to in this standard is given on the inside back cover.

2 Definitions

For the purposes of this Part of BS AU 200, the following definitions apply.

2.1

containment device

a device intended to contain the water which is shed by the vehicle tyre and to return it to the road surface at a low velocity

2.2

wheel guard (mudguard)

that part of the containment device which is designed to restrict or prevent surface water, which is shed by the vehicle's tyres, from being projected away from the vehicle

NOTE 1 The wheel guard may be part of the body structure.

NOTE 2 Wheel guards should reduce the danger and also provide protection as far as possible to other road users from stones, mud, ice and snow thrown up by the tyres.

2.3

valance

that part of the containment device in or approaching the longitudinal vertical plane of the vehicle

2.4

wheel flap

that part of the containment device attached to the underside of the vehicle or the wheel guard to form an extension towards the road surface, behind the wheel, in or approaching the plane normal to the longitudinal planes of the vehicle

2.5

suppression device

a device or material designed to absorb or dissipate the energy of water thrown from the tyre in order to reduce the degree to which the water shatters into fine droplets on hitting a surface

NOTE It may form part of the containment device.

2.6

air/water separator

a device forming part of the valance and/or wheel flap which permits air to flow through whilst reducing the emission of spray

2.7

lifting axle

an axle which may be raised from the road surface in the normal course of vehicle operation

2.8

tread breadth

the breadth of that part of the tyre which contacts the road under normal conditions of use measured at 90° to the peripheral line of the tread

3 Compliance

Spray reducing devices shall be in accordance with the following.

- a) Spray reducing devices for motor vehicles having a maximum gross mass exceeding 7.5 t, for articulated tractor units having a train mass exceeding 7.5 t and for trailers having a maximum gross mass exceeding 3.5 t, except for the case detailed in b), shall comply with either section 2 or section 4.
- b) Spray reducing devices for non-steerable rear wheels fitted to motor vehicles having a maximum gross mass exceeding 7.5 t and to trailers having a maximum gross mass exceeding 3.5 t and where the wheels are normally covered by the floor of the vehicle body shall comply with section 2 or section 3 or section 4.