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Australian Standard 1906, Part 3—1982

RETROREFLECTIVE MATERIALS AND DEVICES FOR ROAD TRAFFIC CONTROL PURPOSES

Part 3—RAISED PAVEMENT MARKERS (RETROREFLECTIVE AND NON-RETROREFLECTIVE)

STANDARDS ASSOCIATION OF AUSTRALIA
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This Australian standard was prepared by Committee CE/16, Retroreflective Devices. It was approved on behalf of the Council of the Standards Association of Australia on 6 July 1982 and published on 11 October 1982.

The following interests were represented on the committee responsible for the preparation of these standards:

Australian Federation of Construction Contractors

Australian Optometrical Association

Australian Road Research Board

Confederation of Australian Industry

Department of Transport

National Association of Australian State Road Authorities

National Measurement Laboratories

Railways of Australia Committee

University of New South Wales

This standard was issued in draft form for comment as DR 80187.

1906 Retroreflective materials and devices for road traffic control purposes

1906.3—1992 Raised pavement markers (retroreflective and non-retroreflective)

22pp *FF*

Specifies performance requirements for retroreflective and non-retroreflective raised pavement markers which are to be bonded directly to the pavement surface. It does not preclude the development of markers with alternative methods of fixing to the road, but in such cases it specifies that performance shall be not less than for those directly bonded to the surface. Test methods are given in appendices to this Standard.

Committee MS/49: Supersedes AS 1906.3—1982 and AS 2445.3.1 to AS 2445.3.10—1982: Draft for comment DR 91141: Publication date 1992-08-15: ISBN 0 7262 7460 7.

STANDARDS AUSTRALIA

Amendment No 1
to
AS 1906.3—1982
Retroflective materials and devices for road traffic control purposes
Part 3: Raised pavement markers
(Retroflective and non-retroflective)

CORRECTION

The 1982 edition of AS 1906.3 is amended as follows; the amendment should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clause 2.4.7.

Published on 4 June 1990.

AMDT No 1 JUNE 1990

Page 7. Clause 2.4.7 Glaze/coating thickness.

Third line:

Delete '.... not less than 0.75 mm', and *substitute* '.... not less than 0.075 mm'.

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AUSTRALIAN STANDARD

RETROREFLECTIVE MATERIALS AND DEVICES FOR ROAD TRAFFIC CONTROL PURPOSES

Part 3 RAISED PAVEMENT MARKERS (RETROREFLECTIVE AND NON-RETROREFLECTIVE)

AS 1906, Part 3—1982

First published 1982

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PREFACE

This standard was prepared by the Association's Committee on Retroreflective Devices. It is one of a group of standards dealing with traffic control devices and delineator materials.

Other standards in the group are as follows:

AS 1742 Manual of Uniform Traffic Control Devices
- Part 1—Description and Use of Elemental Traffic Control Devices
- Part 2—Application of Traffic Control Devices to Traffic Situations

AS 1743 Road Signs

AS 1744 Standard Alphabets for Road Signs

AS 1906 Retroreflective Materials and Devices for Road Traffic Control Purposes
- Part 1—Retroreflective Materials
- Part 2—Retroreflective Devices (Non-pavement Application)

This standard is a performance specification for devices intended to provide night and day delineation by retroreflective and diffuse reflective means respectively, the latter type being referred to as non-retroreflective raised pavement markers. The standard only deals with devices which are bonded to the pavement surface in locations where they are liable to be traversed by vehicle wheels.

Retroreflective devices which are attached to guideposts and retroreflective signs are dealt with in AS 1906, Part 2.

Conventional pavement marking materials tend to lose visibility when covered by a water film. Raised pavement markers are designed to overcome this problem and to provide advance road delineation information to motorists during both wet and dry conditions. The reflectivities of the retroreflective raised pavement markers have been observed to fall dramatically during their first 8 weeks of exposure to the environment and impacts from vehicle tyres. Retroreflectivity then tends to stabilize, with a negligible further reduction in properties unless catastrophic failure occurs.* The acceptance criteria for these markers have therefore been structured round the retroreflectivity CIL value of markers which have been subjected to 8 weeks of vehicle exposure when tested both in wet and dry conditions.

The reflectivities of the non-retroreflective raised pavement markers degrade at a lower rate than those of the retroreflective devices, when exposed in similar situations. Their acceptance criteria have therefore been based on the luminance factor value of new markers.

Reflective property is specified for each of the colours likely to be required for compliance with AS 1742, Parts 1 and 2. Colour measurements on the retroreflective elements are not included in this standard owing to the difficulties unresolved at present involved in this area of measurement.

Laboratory tests structured to simulate a range of accelerated field exposure conditions and tests to check compliance within specified limits are described. Also specified are the physical properties required under simulated field exposure conditions. This standard does not cover possible requirements for skid resistance.

The acceptance criterion of a batch of retroreflectors has been formulated on a statistical basis. This approach recognizes the actual distribution of results in photometric tests and restricts underperformance to known and acceptable limits.

Performance requirements of adhesives which are used for bonding markers to the pavement surface will be specified in a standard in course of preparation.

*Reference: 'Raised Reflective Pavement Markers; Installation Performance and Specification', Freeman and Vincent, ARRB PROC. Vol.9, 1978.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
RETROREFLECTIVE MATERIALS AND DEVICES FOR ROAD TRAFFICE CONTROL PURPOSES

PART 3—RAISED PAVEMENT MARKERS (RETROREFLECTIVE AND NON-RETROREFLECTIVE)

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies the performance requirements for retroreflective and non-retroreflective raised pavement markers, which are to be bonded directly to the pavement surface.

The standard does not apply to materials and devices which are to be located above or to one side of the carriageway. This does not preclude the development of markers with alternative methods of affixing to the road, for which the performance shall be not less than for those directly bonded to the surface.

1.2 DESCRIPTION. For the purpose of this standard, retroreflective markers consist of discrete devices of sufficiently small physical size as to be effectively a point source of light when viewed at normal night-time highway viewing distances. They may provide a degree of delineation during daylight owing to the contrasting colour, reflection and profile with respect to the pavement surface. Non-retroreflective markers primarily reflect ambient light during the daytime and to a limited degree when illuminated by vehicle headlight at night.

NOTE: This description is not intended to limit the design or method of manufacture, provided that the devices comply with the requirements of Section 2 as applicable to retroreflective markers, non-retroreflective markers, or both.

1.3 APPLICATION. All markers shall comply with the appropriate requirements specified in Section 2.

1.4 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 2445.3 Methods of Sampling and Testing Retroreflective Materials and Devices for Road Traffic Control Purposes
Part 3—Raised Pavement Markers (Retroreflective and Non-retroreflective)

2445.3.1	Sampling and Conditioning of Samples
2445.3.2	Coefficient of Luminous Intensity (CIL) of Type A and Type A/B Markers
2445.3.3	Luminance Factor of Type B and Type A/B Markers
2445.3.4	Water Absorption
2445.3.5	Heat Test
2445.3.6	Ultraviolet Exposure Test
2445.3.7	Impact Resistance of Type A and Type A/B Markers
2445.3.8	Compressive Strength
2445.3.9	Glaze / Coating Thickness
2445.3.10	Bond Strength

1.5 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.5.1 Retroreflective marker—a device which produces an effective point source of light at normal highway viewing distances by reflecting incident light in directions close to the direction from which it came.

1.5.2 Reference point—the centroid of the surface carrying the reflective elements.

1.5.3 Reference direction—a line passing through the reference point, parallel to the longitudinal axis of symmetry, and lying in a plane parallel to the base of the marker.

1.5.4 Observation angle (α)—the angle between the straight lines joining the reference point of the marker to the centre of the receptor and to the centre of the source of illumination (see Fig. 1.1). Both the observation and the entrance angle are always in the same plane and on the same side of the line joining the centre of the marker to the centre of the source of illumination.

1.5.5 Entrance angle (β)—the angle between the reference direction and the straight line joining the reference point of that marker to the centre of the source of illumination (see Fig. 1.1).

1.5.6 Coefficient of reflex luminous intensity (CIL)—the quotient expressed in candela per lux ($cd.lx^{-1}$) obtained by dividing the reflected luminous intensity in the direction considered, by the illuminance at the retroreflective surface, for given observation and entrance angles. It is referred to as the 'CIL value'.

1.5.7 Illuminance at the retroreflective surface—the expression used conventionally to designate the illuminance produced by the source of light and measured in a plane perpendicular to the incident light beam and passing through the reference point.

1.5.8 Luminance factor—the ratio of the luminance of the material to that of a perfect diffusing reflector illuminated and viewed under the same conditions.