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**RETROREFLECTIVE MATERIALS  
AND DEVICES FOR ROAD  
TRAFFIC CONTROL PURPOSES**

**Part 2 — RETROREFLECTIVE  
DEVICES  
(NON-PAVEMENT  
APPLICATION)**

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The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Federation of Construction Contractors  
Australian Road Research Board  
Australian Optometrical Association  
CSIRO, National Measurement Laboratory  
Department of Motor Transport, New South Wales  
Department of Transport  
National Association of Australian State Road Authorities  
Railways of Australia  
University of New South Wales

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## PREFACE

This standard was prepared by the Association's Committee on Retroreflective Devices. It replaces SAA Int. 355 (1955), and is one of a group of standards dealing with traffic control devices and the materials used in their manufacture.

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
AS 2445	Methods of Sampling and Testing Retroreflective Materials and Devices for Road Traffic Control Purposes

This standard is a performance specification for two types of discrete retroreflective devices which have higher photometric performance than sheet material specified in Part 1. Both types utilize the headlight beam of the road vehicle in which the observer (driver) is travelling and are designed to display a vertical or near vertical face to the observer.

The first type of device is intended to provide roadside delineation at night. The dimensions specified make these devices suitable for attachment to 100 mm wide guideposts. The second type of device, commonly known as sign legend buttons, is intended to provide a supplement or an alternative to other means of reflectorization of legends on traffic signs.

Although retroreflectors of present manufacture which are capable of complying with this standard are of the corner-cube type, Section 2 has been written in terms sufficiently general in content to encourage the development of devices employing alternative retroreflective principles. However, in recognition of the current usage of the corner-cube variety, Section 4 has been included to specify precisely the requirements of a corner-cube retroreflector.

Photometric performance is specified for each of the colours likely to be required for compliance with AS 1742, Parts 1 and 2. Also specified are the physical properties required under simulated field exposure conditions. Colours are specified by visual comparison rather than by measurement of CIE trichromatic coordinates as there are few testing laboratories equipped to provide reproducible measurements of colour coordinates.

Devices are tested in new condition because it would be difficult to standardize photometric tests for devices in a dirty condition and reflectors to which this standard applies are likely to retain their photometric properties if properly cleaned.

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 under-performance to known and acceptable limits.

Methods of sampling and testing retroreflectors are given in AS 2445.2.

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## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
for  
**RETROREFLECTIVE MATERIALS AND DEVICES FOR ROAD**  
**TRAFFIC CONTROL PURPOSES**

## PART 2—RETROREFLECTIVE DEVICES (NON-PAVEMENT APPLICATION)

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This standard specifies in general terms the performance requirements of retroreflective devices (known as 'retroreflectors') intended for use as roadside delineators and as road sign button reflectors. It also specifies in specific terms the performance requirements where retroreflectors are of the corner-cube variety. It applies to retroreflectors which are located above or to one side of the carriageway, displaying a vertical or near vertical face to traffic, and excludes devices which are placed directly on the pavement surface.

**1.2 DESCRIPTION.** For the purpose of this standard, retroreflectors 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 are higher photometric performance devices than delineators or sign legends made from Class 1 and Class 2 retroreflective materials specified in AS 1906, Part 1. They are generally moulded from a suitable plastics material, tinted to the required colour, and commonly use the corner-cube principle for the retroreflecting elements.

NOTE: This description is not intended to limit the design or method of manufacture.

**1.3 APPLICATION.** Retroreflectors shall comply with the general requirements of Sections 2 and 3, as appropriate. Where retroreflectors are of the corner-cube variety, however, they shall also comply with Section 4.

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

**1.4.1 Observation angle ( $\alpha$ )**—the angle between the straight lines joining the centre of a test piece to the centre of the receptor and to the centre of the source of illumination (see Fig. 1, AS 2445.2).

NOTE: Both the observation and the entrance angles (see Clause 1.4.2) are always in the same plane and on the same side of the line joining the centre of the test piece to the centre of the source of illumination.

**1.4.2 Entrance angle ( $\beta$ )**—the angle between the normal at the centre of a test piece and the straight line joining the centre of that test piece to the centre of the source of illumination (see Fig. 1, AS 2445.2). (See Note to Clause 1.4.1.)

**1.4.3 Rotation angle ( $\epsilon$ )**—the angle measured from an arbitrary starting point, through which the retroreflector is rotated, during the photometric testing, about an axis normal to, and passing through the centre of, the test piece (see Fig. 1, AS 2445.2).

**1.4.4 Illuminance at the retroreflector**—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 centre of the test piece.

**1.4.5 Coefficient of reflex luminous intensity (CIL)**—the value expressed in candela per lux ( $\text{cd.lx}^{-1}$ ) obtained by dividing the reflected luminous intensity in the direction considered, by the illuminance at the retroreflective surface, for given observation, entrance and rotation angles.

NOTE: This coefficient is applicable to corner-cube retroreflectors as defined in Clause 1.4.6.

**1.4.6 Corner-cube retroreflector**—a series of retroreflective elements in which the retroreflection is achieved by three planes mutually at right angles.

**1.5 CLASSIFICATION.** Retroreflectors are classified according to application in two types, as follows:

- (a) *Type A—Roadside delineators.* Type A retroreflectors are located singly or in groups on suitable vertical supports, e.g. guide posts, at the sides of a carriageway to delineate its alignment. They are intended for night-time viewing only.
- (b) *Type B—Sign legend buttons.* Type B retroreflectors may be used on the legends, symbols etc of traffic signs to create or enhance the visibility of the message when viewed in a retroreflective mode. They are intended for both night-time and daytime viewing.