AS/NZS 1906.1:2007
(Incorporating Amendment No. 1)

AS/NZS 1906.1:2007

Australian/New Zealand Standard™

Retroreflective materials and devices for road traffic control purposes

Part 1: Retroreflective sheeting

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee MS-049, Retroreflective Devices. It was approved on behalf of the Council of Standards Australia on 19 January 2007 and on behalf of the Council of Standards New Zealand on 2 February 2007.
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The following are represented on Committee MS-049:

AUSTROADS
Accident Compensation Corporation, New Zealand
Australian Chamber of Commerce and Industry
Australian Industry Group
AWTA Textile Testing
Land Transport Safety Authority, New Zealand
National Association of Testing Authorities Australia
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Part 1: Retroreflective sheeting

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PREFACE

This Standard was prepared by the Joint Australia/New Zealand Committee MS-049, Retroreflective Devices and supersedes AS/NZS 1906.1:1993, *Retroreflective materials and devices for road traffic control purposes,* Part 1: *Retroreflective materials*.

This Standard incorporates Amendment No. 1 (June 2014). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

It is one of a series of Standards on retroreflective devices as follows:

AS/NZS
1906 Retroreflective materials and devices for road traffic control purposes
1906.1 Part 1: Retroreflective sheeting (this Standard)
1906.2 Part 2: Retroreflective devices (non-pavement application)
1906.4 Part 4: High visibility materials for safety garments

AS
1906 Retroreflective materials and devices for road traffic control purposes
1906.3 Part 3: Raised pavement markers (retroreflective and non-retroreflective)

The objective of this Standard is to provide road authorities, manufacturers and testing authorities with a uniform supply specification for retroreflective sheeting.

The following are the principal changes and additions to this edition:

(a) Introduction of Class 1W microprismatic retroreflective sheeting.

(b) Introduction of retroreflective sheeting specifically designed for motor vehicle number plates.

(c) CIL and colour specification and measurement for fluorescent sheeting.

(d) Specification of durability test exposures in terms of radiant energy received rather than by exposure time.

(e) Revised test for performance under simulated rainfall conditions.

(f) New informative appendix on selection and use of sheeting.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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FOREWORD

The three types of retroreflective sheeting described in this Standard (Classes 1W, 1 and 2) are principally for use for road traffic signs. Careful consideration should be given as to whether sheeting which complies with this Standard is appropriate for other applications. For example, the Standard is not applicable to retroreflective sheeting for use on safety garments (see AS/NZS 1906.4), or for roadside delineators (see AS/NZS 1906.2). This Standard has been written solely as a performance specification for retroreflective sheeting and with the exception of some advice given in Appendix B, does not give guidance on its use.

Included in this Standard are specifications applicable to micro-prismatic sheeting (Class 1W). This is a technologically advanced sheeting capable of high photometric performance. Users should, however, be aware of some notable differences in the characteristics of this sheeting when compared with sheeting using glass sphere technology. There can be quite significant changes in photometric performance with changes in rotation angle. This highlights the need to observe manufacturers' orientation marks on the sheeting or other instructions as to the correct orientation of the sheeting in applications such as on traffic signs and to ensure that on any one sign, all pieces of sheeting are orientated in the same direction.

As with other types of retroreflective sheeting, the performance of micro-prismatics is a compromise between high performance at narrow observation angles (i.e. the observer is a long distance from the sign) and acceptable residual performance at wider observation angles (i.e. the observer is close to the sign). This compromise can be altered in manufacture by small adjustments to the characteristics of the micro-prisms thus making it possible to optimise retroreflection or sign brightness over a range that best meets the requirements of the driver at all of the reading distances and viewing geometries at which the sign needs to be read.

Glass sphere technology based retroreflective sheeting can provide a lower, but under appropriate conditions, satisfactory performance at both small observation angles (related to long distance viewing) and at large observation angles (related to viewing at close distances).

The micro-prismatic sheeting (Class 1W) specified in this Standard tends towards the option of a wider observation angle so that a roadside or overhead sign laterally or vertically displaced by an appreciable amount from the observer's path of travel can still be satisfactorily read by retroreflected light at close viewing distances. The sheeting specified as Class 1A in the previous edition of this Standard and which is now specified in AS/NZS 1906.2 for delineation purposes may also be suitable for sign legends in cases where its high level narrow angle performance is appropriate.

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Australian/New Zealand Standard
Retroreflective materials and devices for road traffic control purposes

Part 1: Retroreflective sheeting

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the performance requirements for retroreflective sheeting used in the manufacture of road signs and related traffic control devices. It does not apply to retroreflective pavement markings.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS

1580 Paints and related materials—Methods of test
1580.403.1 Method 403.1: Scratch resistance

1734 Aluminium and aluminium alloys—Flat sheet, coiled sheet and plate

1906 Retroreflective materials and devices for road traffic control purposes
1906.2 Part 2: Retroreflective devices (non-pavement application)

CIE
20 Recommendations for the integrated irradiance and spectral distribution of simulated solar radiation for testing purposes

54.2 Retroreflection: Definition and measurement

A1

ANSI/ISEA
107-2010 High-Visibility Safety Apparel and Headwear

ASTM
A240M-06b Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
D2486-06 Standard Test Methods for Scrub Resistance of Wall Paints

1.3 DESCRIPTION

Retroreflective sheeting usually consists of one of the following:

(a) Minute glass beads enclosed in a thin, transparent, smooth-surfaced plastic matrix, tinted according to the required colour.

(b) Glass beads encapsulated in a series of cells, the upper surface of which is a transparent film, tinted according to the required colour.

(c) Minute cube-corner or prismatic elements moulded into the rear face of a clear flexible sheet, tinted according to the required colour (commonly referred to as micro-prismatic sheeting).

NOTE: These descriptions are not intended to limit the design or method of manufacture provided that the sheeting complies with the requirements of this Standard.