



Vehicles—Rear marker plates

Part 1: Reflective rear marker plates— Classification and manufacturing requirements



This Australian Standard® was prepared by Committee ME-053, Heavy Road Vehicles. It was approved on behalf of the Council of Standards Australia on 29 August 2017. This Standard was published on 23 October 2017.

The following are represented on Committee ME-053:

- Australian Industry Group
- Australian Road Research Board
- Australian Trucking Association
- Austroads
- Commercial Vehicle Industry Association of Australia
- Department of Infrastructure and Regional Development (Australian Government)
- Heavy Vehicle Industry Association
- Municipal Works Operations Association
- National Heavy Vehicle Regulator
- Queensland University of Technology
- Society of Automotive Engineers, Australasia

Additional Interests:

- Reflective material and plates manufacturers
-

This Standard was issued in draft form for comment as DR AS 4001.1:2017.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard®

Vehicles—Rear marker plates

Part 1: Reflective rear marker plates— Classification and manufacturing requirements

Originated as AS 4001.1—1992.
Second edition 2003.
This edition AS 4001.1:2017.

COPYRIGHT

© Standards Australia Limited

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968.

Published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 978 1 76035 931 7

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-053, Heavy Road Vehicles, to supersede AS 4001.1—2003, *Motor vehicles—Rear marker plates*, Part 1: *Manufacturing and classification requirements for Class 1A and Class 1 reflective plates*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide vehicle rear marker plate manufacturers with manufacturing requirements that specify materials, production processes, graphics and text design, and performance requirements.

This revision upgrades the Australian performance requirements for reflective rear marker plates to those retroreflective performance classes used for road signage on highways within Australia. This sees the removal of Class 2 retroreflective materials and AS 4001.3. Increasing the minimum retroreflective sheeting performance level increases the visibility distance of the rear marker plates when mounted on vehicles, thus increasing the safety of the vehicle itself and other road users.

This Standard is Part 1 of AS 4001, *Vehicles—Rear marker plates*, which is published in Parts as follows:

AS

4001.1 Part 1: Reflective rear marker plates—Classification and manufacturing requirements (this Standard)

4001.2 Part 2: Reflective rear marker plates—Fitting requirements

During the 1980s, the then Australian Federal Office of Road Safety initiated a program to improve the night time visibility of vehicles over 12 t Gross Vehicle Mass. Subsequently, rear marker plates were introduced in Australian Design Rules, and as outlined in the 2003 edition of this Standard, could be manufactured from retroreflective materials of Class 2 (now Class 100), Class 1 (now Class 400) or Class 1A performance classes.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	4
1.2 REFERENCED DOCUMENTS.....	4
1.3 DEFINITIONS.....	4
1.4 GENERAL REQUIREMENTS.....	5
1.5 MARKING	5
SECTION 2 CLASSIFICATION	
2.1 GENERAL.....	7
2.2 CATEGORIES.....	7
SECTION 3 MATERIAL REQUIREMENTS	
3.1 GENERAL.....	12
3.2 BACKING MATERIAL	12
3.3 PHOTOMETRIC PERFORMANCE DURABILITY REQUIREMENTS	12
SECTION 4 MANUFACTURING REQUIREMENTS	
4.1 GENERAL.....	13
4.2 BACKING PREPARATION	13
4.3 MARKER PLATE GRAPHICS AND TEXT.....	13
4.4 DIMENSIONS OF PLATES.....	14
4.5 CUTTING, PUNCHING AND MARKING OF PLATES.....	14
4.6 MOUNTING HOLES AND CORNER RADII	14
SECTION 5 REAR MARKER PLATE GRAPHICS LAYOUT	
5.1 GENERAL.....	18
5.2 LAYOUT OF TEXT AND GRAPHICS	18
5.3 TOLERANCES.....	18
APPENDIX A IN-SERVICE DURABILITY	26

STANDARDS AUSTRALIA

Australian Standard

Vehicles—Rear marker plates

Part 1: Reflective rear marker plates—Classification and manufacturing requirements

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard specifies manufacturing requirements for Class 1A, Class 400 and UN R70 performance reflective rear marker plates intended for use on road vehicles. It defines materials, production processes, graphics and text design, and performance requirements.

NOTES:

- 1 Appendix A gives guidelines on necessary durability under user maintenance conditions.
- 2 Part 2 of this Standard (AS 4001.2) specifies fitting requirements on vehicles including the location of Class 1A, Class 400 and UN R70 performance reflective rear marker plates.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1744 | Standard alphabets for road signs |
| 4001 | Vehicles—Rear marker plates |
| 4001.2 | Part 2: Reflective rear marker plates—Fitting requirements |

AS/NZS

- | | |
|--------|---|
| 1734 | Aluminium and aluminium alloys—Flat sheet, coiled sheet and plate |
| 1906 | Retroreflective materials and devices for road traffic control purposes |
| 1906.1 | Part 1: Retroreflective materials |
| 1906.2 | Part 2: Retroreflective devices (non-pavement application) |

UN

- | | |
|-----|--|
| R70 | United Nations Regulation No. 70 - Rev.1—Uniform provisions concerning the approval of rear marking plates for heavy and long vehicles |
|-----|--|

1.3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.3.1 Backing material

Either—

- (a) a rigid plate, the surface of which has been prepared prior to the application of the retroreflective material; or
- (b) a properly cleaned surface of a motor vehicle or trailer.

1.3.2 Plate manufacturer

The manufacturer of the rear marker plate.

1.3.3 Rear marker plate

A marking intended to improve the visibility of the rear of the vehicle.

NOTE: Also known as 'plate'.

1.3.4 Retroreflective material

A material which reflects an incident light beam directly back to its source in a narrow cone.

1.3.5 Retroreflective material manufacturer

The manufacturer of the background retroreflective material and/or the supplier of the screen process ink.

1.3.6 Shall

Indicates that a statement is mandatory.

1.3.7 Should

Indicates a recommendation.

1.4 GENERAL REQUIREMENTS

Rear marker plates shall consist of retroreflective yellow and red areas in a distinctive pattern to gain enhanced visibility, and early recognition and identification of road vehicles either in daylight or night.

Rear marker plates shall be manufactured by using a retroreflective material, combined with red graphics and/or black text. The base retroreflective material shall incorporate a pressure-sensitive adhesive to allow either bonding to a compatible, weather-resistant backing plate for mechanical fastening to a vehicle or enable direct application to a properly cleaned vehicle surface.

The manufacture of rear marker plates may include some, or all, of the following processes, if required:

- (a) Cutting the backing material to size and shape.
- (b) Etching and cleaning the backing material.
- (c) Bonding the base retroreflective background material to the backing material.
- (d) Surface printing or below surface printing of graphics and text.
- (e) Packaging.

1.5 MARKING

1.5.1 Package

1.5.1.1 General

When there is a likelihood of any damage to the plate during transport or storage, a suitable packaging material shall be provided.

1.5.2 Marking

The following information shall be permanently and legibly marked in English on the outside of the packing, in letters not less than 6 mm high on each retail package or, in the case of bulk purchases by an original equipment manufacturer (OEM), not less than one copy of the following information shall be included in each bulk pack:

- (a) The name and address of the manufacturer.
- (b) A brief description of the category and type of plate or pressure-sensitive marking.

- (c) Installation instructions that shall include advice relative to the category of plate within the package, for the following:
 - (i) Techniques for cleaning and installing the plate on the vehicle, to prevent surface damage, corrosion and to obtain longest service life.
 - (ii) Maintenance and cleaning of the plate, preferably illustrated by a schematic representation where appropriate.
 - (iii) Limitations on bending plates to suit any non-flat area used on the vehicle for installation.
 - (iv) An explanation that cutting a plate may damage the retroreflective material and reduce its durability and that a preferred alternative strip plate is used wherever possible.
 - (v) A statement that a damaged or lost plate shall be replaced with a matched vehicle set of plates.
 - (vi) Installation methods, compatible with the rear marker plate and the material of the vehicle to which the rear marker plate is in contact, to avoid chemical or electrolytic corrosion. Include a statement that where dissimilar metals would otherwise be in contact they shall be separated by insulating material, e.g. synthetic washers.

1.5.3 Rear marker plate

Rear marker plates shall be marked on the retroreflective surface by printing, in either red or black as applicable, with the following:

- (a) The text and graphics specified in Section 5.
- (b) The name of the manufacturer, in alphanumerics not greater than 3 mm in height.
- (c) Where material conforming with AS 1906.1 is used, the words 'AS 4001.1 Class X' shall be included, where 'X' is the class of retroreflective sheeting used, and shall not be greater than 3 mm in height.
- (d) Where sheeting conforming with UN R70 is used for the retroreflective material, the words 'AS 4001.1 UN R70' shall be included.

The only other additional information that may be displayed on the retroreflective surface is an approval mark required under UN R70.

SECTION 2 CLASSIFICATION

2.1 GENERAL

Rear marker plates suitable for use on road vehicles shall be of either rectangular or strip configurations. Categories of rectangular plates are described in Clause 2.2.1 and categories of strip plates are described in Clause 2.2.2. 'Do not overtake turning vehicle' plates are described in Clause 2.2.3, and may be used in conjunction with either rectangular or strip plates.

Some categories include an alphabetic letter to allow clarification as follows:

- (a) L signifies a plate displaying black text only (i.e. a legend).
- (b) A, B, and C identify the slope direction of colour bands on strip plates, as shown in Figure 2.3.
- (c) Categories 33, 34 and graphic-only plates and 'strip graphic' plates include small letters in red to indicate the correct installed orientation when necessary.
- (d) Rectangular plates are Categories 33, 34, 31L and 33L.

2.2 CATEGORIES

2.2.1 Rectangular (graphics) plates

Rectangular (graphics) plates consist of the following categories:

- (a) *Category 33*

A Category 33 plate as shown in Figure 2.1, shall be 300 mm × 300 mm, with graphics only.

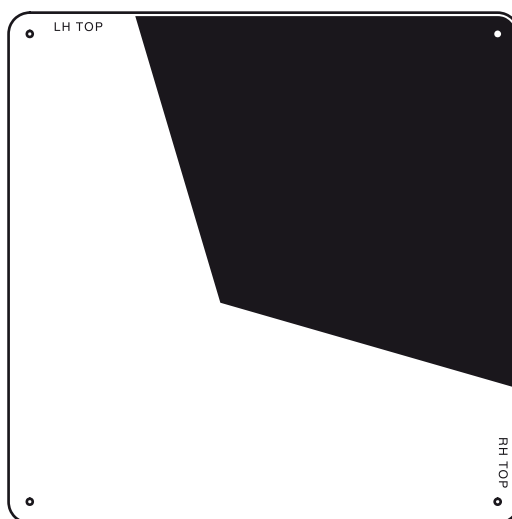


FIGURE 2.1 CATEGORY 33 PLATE

- (b) *Category 34*

A Category 34 plate, as shown in Figure 2.2, shall be 300 mm wide × 400 mm high with single text and graphics. It consists of a 100 mm high section for black text (as for the Category 31L plate), with a 300 mm × 300 mm red graphics section below (as for the Category 33 plate). For Category 34 plates, the side of the vehicle the plate has been designed for is identified by an additional letter code.

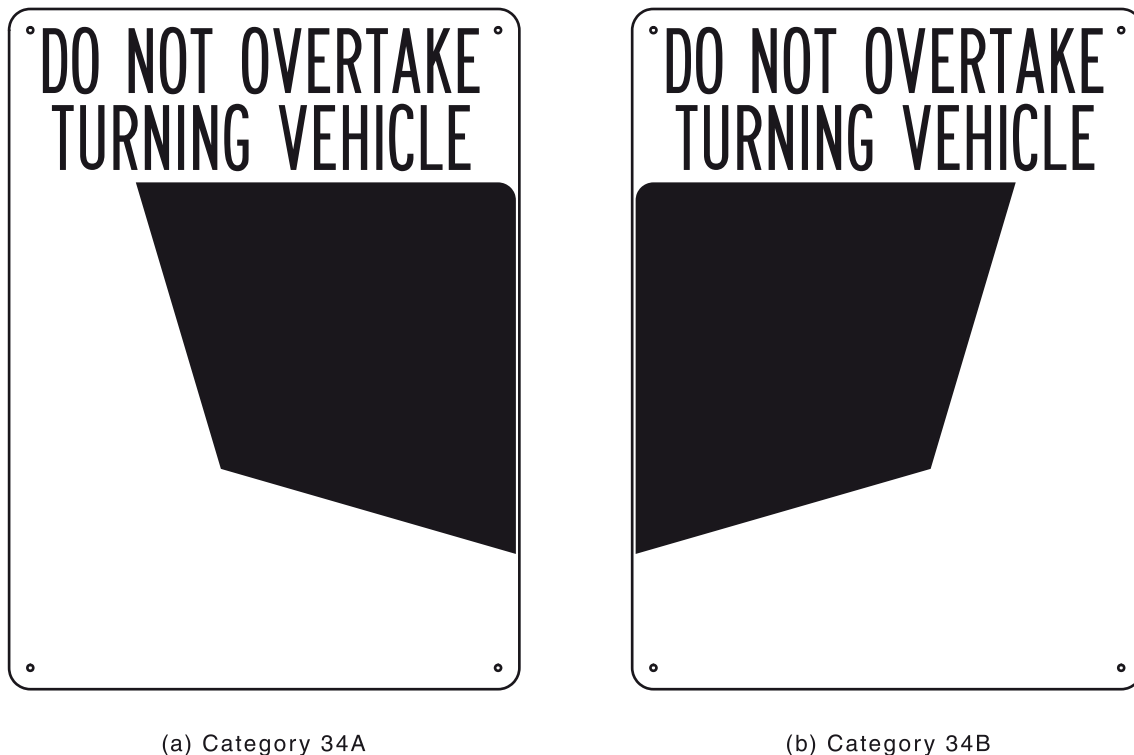


FIGURE 2.2 CATEGORY 34 PLATES

2.2.2 Strip (graphics) plates

Strip (graphics) plates, as shown in Figure 2.3, with the exception of the Category 615 plates, are manufactured from a 1600 mm wide $\times$ 100 mm high strip, which may be cut after screen processing into 800 mm or 400 mm lengths (as applicable) by the plate manufacturer, therefore they are known as Category 161, Category 81 or Category 41 respectively. Category 615 strip plates, as shown in Figure 2.4, are manufactured from 150 mm strip in 600 mm lengths. For Categories 81, 41 and 615, the slope of the colour bands is identified by an additional letter code.

Strip plates consist of the following categories:

(a) *Category 161*

A Category 161 plate shall be 1600 mm wide $\times$ 100 mm high. The graphics consist of red colour bands as shown in Figure 2.3(a).

(b) *Category 81*

A Category 81 plate shall be 800 mm wide $\times$ 100 mm high. The graphics consist of red colour bands which shall be in three configurations, therefore, all Category 81 rear marker plates shall include a letter code A, B or C to indicate the portion of the 1600 mm long strip from which it was cut during manufacturing. Figure 2.3 shows these configurations as—

- (i) Category 81A plate from the left end of a Category 161 plate [see Figure 2.3(c)];
- (ii) Category 81B plate from the right end of a Category 161 plate [see Figure 2.3(c)]; and
- (iii) Category 81C plate from the centre section of a Category 161 plate [see Figure 2.3(b)].