

Australian/New Zealand Standard™

Safety glazing for land vehicles



AS/NZS 2080:2006

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME-055, Safety Glass for Land Transport. It was approved on behalf of the Council of Standards Australia on 14 August 2006 and on behalf of the Council of Standards New Zealand on 25 August 2006.
This Standard was published on 26 September 2006.

The following are represented on Committee ME-055:

Australasian Railway Association
Australian Automobile Association
Australian Business Limited
Australian Chamber of Commerce and Industry
Australian Industry Group
Certification Bodies (Australia)
Commonwealth Department of Transport and Regional Services
Department of Defence (Australia)
Federal Chamber of Automotive Industries
Federation of Automotive Products Manufacturers
Glass Association of New Zealand
Insurance Council of Australia
Insurance Council of New Zealand
Land Transport Safety Authority New Zealand
Department for Transport, Energy and Infrastructure
Victoria Police
Victorian College of Optometry
W.A. Department for Planning and Infrastructure

Keeping Standards up-to-date

Standards are living documents which 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 Standards may also be withdrawn.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 which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 03430.

Australian/New Zealand Standard™

Safety glazing for land vehicles

Originated in Australia as AS R1—1941.
Previous edition AS/NZS 2080:1995.
Fourth edition 2006.

COPYRIGHT

© Standards Australia/Standards New Zealand

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.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 7741 4

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-055, Safety Glass for Land Transport to supersede AS/NZS 2080:1995 *Safety glass for land vehicles*.

In general, the performance requirements in this Standard are based on UNECE Reg. 43, *Uniform provisions concerning the approval of safety glazing materials*, with some significant differences. This Standard adopts the minimum 75% luminous transmittance requirements of ADR 8, through the primary vision area of windscreens of motor vehicles, except for railway vehicles, for which the minimum requirement is 70%. The luminous transmittance of all types of safety glass other than windscreens shall not be less than 70% except for—

- (a) those applications nominated in ADR 8, for which there is no minimum requirement; and
- (b) special applications such as rolling stock and armoured vehicles.

In this revision, the Committee agree to remove the uniformity test and the thickness specification for safety glass as these matters are covered by well-established industry practice.

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.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	4
1.2 REFERENCED DOCUMENTS	4
1.3 DEFINITIONS	5
1.4 TYPES OF LAMINATED SAFETY GLASS	6
1.5 LOCATION OF PRIMARY VISION AREA OF WINDSCREENS	6
1.6 OPTICAL, MECHANICAL AND OTHER REQUIREMENTS OF SAFETY GLASS	7
SECTION 2 MARKING	
2.1 GENERAL	8
2.2 TYPES OF SAFETY GLASS	8
SECTION 3 OPTICAL REQUIREMENTS	
3.1 SCOPE	9
3.2 REQUIREMENTS FOR WINDSCREENS	9
3.3 REQUIREMENTS FOR ALL TYPES OF SAFETY GLAZING OTHER THAN WINDSCREENS	9
SECTION 4 MECHANICAL REQUIREMENTS FOR TOUGHENED SAFETY GLASS	
4.1 SCOPE	10
4.2 FRAGMENTATION	10
4.3 SAFETY GLASS WITH WORKED SURFACE	10
4.4 SAFETY GLASS WITH INCLUDED ELEMENTS	10
SECTION 5 MECHANICAL AND OTHER REQUIREMENTS FOR LAMINATED SAFETY GLASS	
5.1 SCOPE	11
5.2 REQUIREMENTS FOR WINDSCREENS AND HIGH PERFORMANCE LAMINATES	11
5.3 REQUIREMENTS FOR STANDARD LAMINATES (GLASS OTHER THAN WINDSCREENS AND HIGH PERFORMANCE LAMINATES)	12
5.4 SAFETY GLASS WITH INCLUDED ELEMENTS	12
APPENDICES	
A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD	13
B TEST FOR SECONDARY IMAGE	15
C TEST FOR DISTORTION OF VISION	17
D TEST FOR LUMINOUS TRANSMITTANCE	21
E FRAGMENTATION TEST	23
F RADIATION (LIGHT STABILITY) TEST	25
G HIGH TEMPERATURE (BOIL) TEST	27
H FRACTURE AND ADHESION TEST	28
I IMPACT TEST	30

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Safety glazing for land vehicles

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements and includes methods of test for flat and curved toughened and laminated safety glazing for windscreens and other glazing for land vehicles.

This Standard applies to safety glazing materials intended for installation as windscreens or other panes, or as partitioning, on power-driven vehicles and their trailers, to the exclusion however of glass panes for lighting, light-signalling devices and instrument panels.

This Standard does not cover the installation of safety glazing materials.

NOTE: Advisory information on the assessment of compliance of all types of safety glass with this Standard is given in Appendix A.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1199 | Sampling procedures for inspection by attributes |
| 1199.0 | Part 0: Introduction to the ISO 2859 attribute sampling system |
| 1199.1 | Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection |

AS/NZS

- | | |
|----------|--|
| ISO 9001 | Quality management systems—Requirements |
| ISO 9004 | Quality management systems—Guidelines for performance improvements |

SANZ

- | | |
|---------|---|
| HB18.28 | Conformity assessment—Guidance on a third-party certification system for products |
| HB18 | Guidelines for third-party certification and accreditation |
| HB18.28 | Guide 28—General rules for a model third-party certification scheme for products |

ADR*

- | | |
|-------|---|
| ADR 8 | Australian Design Rules for Motor Vehicles and Trailers |
| | Safety Glazing Material |

CIE

- | | |
|-------------|---|
| 20 (TC-2.2) | Recommendations for the Integrated Irradiance and Spectral Distribution of Simulated Solar Radiation for Testing Purposes |
|-------------|---|

* This reference refers to the latest edition of the Design Rules as amended from time to time.

1.3 DEFINITIONS

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

1.3.1 Acceptable quality level (AQL)

A quality level which corresponds to a relatively high probability of acceptance. It is the maximum percent defective or the maximum number of defects per one hundred items that, for purposes of sampling inspection, can be considered satisfactory as a process average.

1.3.2 Glass plastic

A laminated glass having one layer of glass and one or more layers of plastic material with the plastic layer(s) on the inner face when the glazing is fitted on the vehicle.

1.3.3 Glazing

Glass or plastics material for installation into vehicles.

1.3.4 Laminated safety glass

A safety glass consisting of two or more layers of glass held together by one or more interlayers of plastics material; when none of the layers of glass of which it is composed has been treated it is called 'ordinary laminated safety glass'; when at least one of the layers of glass of which it is composed has been specially treated to increase its mechanical strength and to condition its fragmentation after shattering it is called 'treated laminated safety glass'.

1.3.5 Lot or batch

A quantity of some commodity produced under conditions which are considered uniform.

NOTE: Each lot or batch is assumed, as far as practicable, to consist of materials or items of a single type, grade, class, size, and composition, and to have been manufactured under essentially the same conditions at essentially the same time.

1.3.6 Primary vision area

That part of the windscreen through which the principal operator's field of view is obtained.

1.3.7 Safety glass

A glass which, if fractured, is less likely to cause severe cuts or serious physical injury than ordinary glass, and which is subject to special requirements in regard to visibility, strength, and fragmentation.

1.3.8 Sample

One or more items taken from a batch and intended to provide information about the batch.

1.3.9 Sampling

The procedure used to draw or constitute a sample.

1.3.10 Secondary (or 'ghost') image

A spurious image, usually seen at night when the object being viewed is very bright in relation to its surroundings, e.g. the headlights of an approaching vehicle.

1.3.11 Toughened safety glass

A safety glass consisting of a single layer of glass which has been subjected to special treatment to increase its mechanical strength and to condition its fragmentation after shattering. Toughened safety glass is also known as 'heat-treated safety glass' or 'tempered safety glass'.

1.4 TYPES OF LAMINATED SAFETY GLASS

Laminated safety glass shall be one of the following types:

- (a) *Standard laminate*—laminated safety glass complying with specified minimum optical (specified in Section 3) and mechanical (specified in Section 5) requirements, and being suitable for all applications other than windscreens.
- (b) *High performance laminate*—laminated safety glass complying with specified impact requirements (specified in Clause 5.2.4) in addition to the requirements for standard laminate.
- (c) *Windscreen*—high performance laminate complying with additional specified optical requirements (specified in Clause 3.2).

1.5 LOCATION OF PRIMARY VISION AREA OF WINDSCREENS

1.5.1 Vehicles for road use

The boundaries of the primary vision area of windscreens for road vehicles shall be as determined by the method specified in the ADR applicable at the date of manufacture of the vehicle or, alternatively, either of the following specifications:

- (a) The boundaries of the primary vision area shall be 90 mm from the top and side edges and 65 mm from the bottom edge of the body aperture when viewed from the inside of the vehicle, the measurements being taken along the surface of the glass.
- (b)
 - (i) The lower boundary shall be the higher of the top of the undepressed seat cushion with the seat in its upper most position of adjustment, and 65 mm above the bottom edge of the body aperture when viewed from the inside of the vehicle.
 - (ii) The side boundaries shall be 90 mm from the side edges of the body aperture when viewed from the inside of the vehicle.
 - (iii) The upper boundary shall be 900 mm above the top of the undepressed seat cushion as shown in Figure 1.

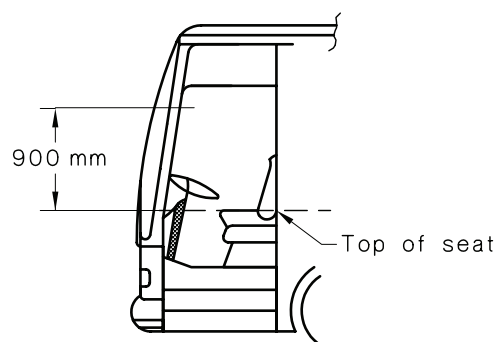


FIGURE 1 PRIMARY VISION AREA

1.5.2 Other vehicles

The boundaries of primary vision area shall be as specified by the purchaser or the vehicle manufacturer.

1.6 OPTICAL, MECHANICAL AND OTHER REQUIREMENTS OF SAFETY GLASS

1.6.1 Toughened safety glass

Toughened safety glass shall comply with the relevant optical requirements of Section 3 and with the relevant mechanical requirements specified in Section 4.

1.6.2 Laminated safety glass

Laminated safety glass shall comply with the optical requirements specified in Section 3 and with the requirements for the mechanical properties and resistance to radiation and high temperature specified in Section 5 for the relevant type of safety glass.

SECTION 2 MARKING

2.1 GENERAL

Every piece of safety glass shall be indelibly and distinctly marked. The markings shall be located so as to be visible when the glass is fitted in the vehicle and shall include:

- (a) Manufacturer's or supplier's name or trademark.
- (b) Reference to this Standard, i.e. AS/NZS 2080.
- (c) Type of glass (a character indicating the type of glass as specified in Clause 2.2, as appropriate).
- (d) In the case of glass with luminous transmittance less than 70%, a symbol to indicate that the luminous transmittance is less than 70% (e.g. VLT<70%).

NOTE: Manufacturers or suppliers making a statement of compliance with this Australian/New Zealand Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

2.2 TYPES OF SAFETY GLASS

Safety glass shall be marked with one of the following, as appropriate:

- (a) The letter 'T' indicating that it is toughened safety glass.
- (b) The letter 'L' or the word 'Laminated', indicating that it is a standard laminated safety glass.
- (c) The letters 'LL' indicating that the material is liquid-laminated safety glass.
- (d) The letters 'LT' indicating that one or more layers of glass in the laminate are toughened glass.
- (e) The letters 'LCHT' indicating that one or more layers of glass in the laminate are chemically toughened glass.
- (f) The letters 'HP' indicating that it is a high performance laminated safety glass.
- (g) The letters 'WHP' indicating that it is windscreen high performance laminated safety glass.

SECTION 3 OPTICAL REQUIREMENTS

3.1 SCOPE

This Section specifies requirements for the optical properties of each safety glass.

3.2 REQUIREMENTS FOR WINDSCREENS

3.2.1 Secondary image

When the windscreen is tested in the primary vision area in accordance with Appendix B—

- (a) with the ‘ring and spot’ target, there shall be no displacement of the secondary image beyond the point of tangency of the central spot image within the inside edge of the circle (this corresponds to a secondary image separation of 15 minutes of arc);
- (b) with the ‘ring’ target, the primary and secondary images of the circle shall either overlap or touch (this also corresponds to a secondary image separation of 15 minutes of arc);
- (c) not more than one secondary image shall be visible; and
- (d) from point to point in the test area there shall be no abrupt change in the displacement of the secondary image.

3.2.2 Distortion of vision

When determined in accordance with Appendix C, the optical distortion in the primary vision area shall not exceed 2 minutes of arc.

3.2.3 Luminous transmittance

When determined in accordance with Appendix D, the luminous transmittance through the windscreen shall be not less than the following, in all areas except shade or obscuration bands:

- (a) For railway vehicle windscreens 70%.
- (b) For bullet resistant windscreens 70%.
- (c) For other windscreens.....75%.

NOTE: Tint used in the production of windscreens should not be such as to cause confusion between the colours used for traffic control lights, signs and signals.

3.3 REQUIREMENTS FOR ALL TYPES OF SAFETY GLAZING OTHER THAN WINDSCREENS

When determined in accordance with Appendix D, the luminous transmittance of all types of safety glass other than windscreens shall be not less than 70% except for shade or obscuration bands and as specified in ADR 8 or special applications such as rolling stock and armoured vehicles.

NOTE: This Standard does not address tinting achieved by the application of tint films.

SECTION 4 MECHANICAL REQUIREMENTS FOR TOUGHENED SAFETY GLASS

4.1 SCOPE

This Section specifies requirements for the mechanical properties of toughened safety glass.

4.2 FRAGMENTATION

4.2.1 General

When tested in accordance with the appropriate method and procedure specified in Appendix E, the safety glass shall comply with the criteria specified in Clause 4.2.2.

Specimens for the tests shall be samples of the product, i.e. whole glass.

4.2.2 Test criteria for toughened safety glass other than windscreens (see Appendix E)

When the test specimen is fractured in accordance with Appendix E, in any 50 mm × 50 mm square test area, the number of fragments for all glazing in excess of 3.5 mm thick shall be not less than 60. In the case of glazing, less than 3.5 mm thick, the number of fragments shall be not less than 50.

4.3 SAFETY GLASS WITH WORKED SURFACE

Safety glass with etched, sandblasted, engraved or other 'worked' surface treatment shall be subject to the appropriate fragmentation test specified in Clause 4.2.

4.4 SAFETY GLASS WITH INCLUDED ELEMENTS

Safety glass with included heating or other elements shall be tested with the elements in position and shall comply with the relevant requirements of this Standard for the particular type of glass.

Where testing of the elements is required by other specifications, it shall not form part of this Standard.