NZS 4223.2:2016

New Zealand Standard

Glazing in buildings

Part 2: Insulating glass units

Superseding NZS 4223.2:1985

NZS 4223.2:2016

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COMMITTEE REPRESENTATION

This standard was prepared under the supervision of the P4223 Committee the Standards Council established under the Standards Act 1988.

The committee consisted of representatives of the following organisations:

BRANZ Ltd	Graeme Beattie
Glass Association of New Zealand	Greg Yim
Insulating Glass Unit Manufacturers' Association	Allan Sage
Ministry of Business, Innovation and Employment	Theofanis Kostas
Ministry of Business, Innovation and Employment	Hamish Handley
Ministry of Business, Innovation and Employment	Nick Locke
New Zealand Institute of Architects	Karl Jones
Window Association of New Zealand	Darryl Mac

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AMENDMENTS

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Glazing in buildings
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NOTES

CONTENTS

REFERENCED DOCUMENTS

Reference is made in this document to the following:

New Zealand standards

NZS 3504:1979	Specification for aluminium windows
NZS 3619:1979	Specification for timber windows
NZS 4223:----	Code of practice for glazing in buildings
Part 1:2008	Glass selection and glazing
Part 3:2016	Human impact safety requirements
Part 4:2008	Wind, dead, snow, and live actions
NZS 4232:----	Performance criteria for fire resisting enclosures
Part 2:1988	Fire resisting glazing systems

Joint Australian/New Zealand standards

AS/NZS 4666:2012	Insulating glass units
AS/NZS 4668:2000	Glossary of terms used in the glass and glazing industry

International standards

ISO 20492:----	Glass in buildings – Insulating glass
Part 1:2008	Durability of edge seals by climate tests
Part 2:2008	Chemical fogging tests
Part 3:2010	Gas concentration and gas leakage
Part 4:2010	Methods of test for the physical attributes of edge seals

American standards

ASTM E2188-10	Standard test method for insulating glass unit performance
ASTM E2189-10	Standard test method for testing resistance to fogging in insulating glass units
ASTM E2190-10	Standard specification for insulating glass unit performance and evaluation

British standards

BS EN 1279----	Glass in building. Insulating glass units
Part 1:2004	Generalities, dimensional tolerances and rules for the system description
Part 2:2002	Long term test method and requirements for moisture penetration
Part 3:2002	Long term test method and requirements for gas leakage rate and for gas concentration tolerances
Part 4:2002	Methods of test for the physical attributes of edge seals
Part 6:2002	Factory production control and periodic tests

New Zealand legislation

Building Act 2004

Building Regulations 1992 (New Zealand Building Code (NZBC))

Clause B1	Structure
Clause B2	Durability
Clause F2	Hazardous building materials
Clause F4	Safety from falling
Clause H1	Energy efficiency

Websites

www.building.govt.nz

www.legislation.govt.nz

LATEST REVISIONS

The users of this standard should ensure that their copies of the above-mentioned standards are the latest revisions and include the latest amendments. Amendments to referenced New Zealand and joint Australian/New Zealand standards can be found on www.standards.co.nz.

REVIEW OF STANDARDS

Suggestions for improvement of this standard will be welcomed. They should be sent to the Chief Executive, Standards New Zealand, Private Bag 2439, Wellington 6140.

FOREWORD

NZS 4223 Part 2:1985 was originally withdrawn and replaced by AS/NZS 4666:2000. However, due to the style and complexity of this document it was never cited as a New Zealand Building Code compliance document by the former Department of Building and Housing (DBH now Building Performance, Ministry of Business, Innovation and Employment). In response, this new simplified Part 2 has been developed and added to the NZS 4223 set of standards to ensure insulating glass units used for glazing in buildings are fit for purpose.

NZS 4223.2 aligns and references AS/NZS 4666 for further information, including guidance on glazing and quality assurance.

The NZS 4223 set of standards provides procedures for glass selection and glazing in buildings subject to wind, dead, live, and snow actions, human impact safety requirements, and special applications such as overhead glazing, balustrades, and glass assemblies.

OUTCOME STATEMENT

NZS 4223.2 is intended to provide a means of compliance with the relevant performance requirements of Building Code Clauses B1, B2, F2, F4, and H1 in order to minimise the potential for strength and durability failures of insulating glass units in buildings.

New Zealand Standard

Glazing in buildings

Part 2: Insulating glass units

1 GENERAL

1.1 Scope

This standard sets out requirements for materials, design, glazing, and quality assurance of insulating glass units (IGUs) for glazing in buildings.

The following are excluded from the scope of NZS 4223 Parts 1, 2, 3, and 4:

(a) Glazing in lift cars and liftwells (refer to NZS 4223.1, Appendix A for guidance);

(b) Furniture glass, cabinet glass, vanities, glass basins, refrigeration units, internal glass fitments and glass wall linings, framed internal wall mirrors, and mirrors not specifically covered by these parts;

(c) Buildings and structures with no public access intended for non-habitable building structures for horticultural or agricultural use;

(d) Restoration or repairs to existing decorated glass;

(e) Glazing applications that might fail due to stresses other than tensile stresses, such as glass floors;

(f) Plastic glazing materials;

(g) The construction and installation of windows, (refer to NZS 3504, NZS 3619, and NZS 4232.2);

(h) Glass blocks, pavers, slumped, formed, or cast glass;

(i) Point-fixed or point-supported systems used for glazing, cladding, signage, and the like, not specifically covered by these parts (refer to Part 1 for design criteria and guidance for specific design).

1.2 Objective

NZS 4223.2 is intended to be used by the window industry, glaziers, designers, and specifiers of glass and glazing, and manufacturers and installers of insulating glass units (IGUs).

In some circumstances, the requirements of Parts 1, 3, and 4 of this standard may exceed the requirements of this part.

1.3 Interpretation

For the purposes of this standard, the word 'shall' refers to requirements that are essential for compliance with the standard, while the word 'should' refers to practices that are advised or recommended.

Notes to the text contain information and guidance and are not considered to be an integral part of the standard.

1.4 Definitions

For the purpose of this standard the following definition and those in NZS 4223 Parts 1, 3, and 4 apply. For further definitions refer to AS/NZS 4668 and AS/NZS 4666.

Insulating glass unit Two or more panes of glass spaced apart and factory hermetically sealed with dry air or special gases in the unit cavity. Often abbreviated to IGU or referred to as 'the unit'

2 MATERIALS

Glass shall comply with NZS 4223.1 and glazing materials shall comply with AS/NZS 4666.

3 DESIGN CRITERIA

3.1 Design

Insulating glass units shall comply with:

(a) Design criteria as set out in section 3 of NZS 4223.1;

(b) Human impact safety requirements as set out in NZS 4223.3; and

(c) Requirements for wind, dead, snow, and live actions as set out in NZS 4223.4.

3.2 Limitations

The limitations in 3.2.1 and 3.2.2 apply to insulating glass unit types.

3.2.1 Inclusions

The design criteria in 3.1 apply to the following types of units:

(a) Hermetically sealed insulating glass units constructed with glass panes;

(b) Insulating glass units with one or more cavity spaces, where the glass panes are parallel to each other;

(c) Stepped edge insulating glass units; and

(d) Insulating glass units containing introduced gases.

The glass panes may include float, patterned, wired, coated, laminated, toughened, heat-strengthened, sand blasted, acid etched, and ceramic enamel (fritted), or combinations of these glass types.

3.2.2 Exclusions to quality assurance

The design criteria in 3.1 shall apply to the following types of units. The quality assurance criteria in section 5 shall not apply to these types of units:

(a) With non-glass panes;

(b) Incorporating capillary/breather tubes or bladder devices (see note 1);

(c) Containing lead-lights, copper lights, or other decorative glass inside the unit;

(d) Incorporating internal venetian blinds, regardless of the control method;

(e) Incorporating painted glass panes, where the paint is on the inside of the IGU;

(f) Containing colonial, muntin, or spacer bar grids inside the unit (see note 2);

(g) With plastic film adhered to any of the glass surfaces;

(h) Where glass panes are not parallel to each other;

(i) Containing a vacuum between the glass panes;

(j) Containing point fixings in or through the unit; or

(k) Incorporating heated panes.

NOTE –

(1) Appendix B of AS/NZS 4666 does, however, specify some aspects deemed essential for the inclusion of such elements.

(2) Appendix H of AS/NZS 4666 does, however, specify some aspects deemed essential for the inclusion of such elements.

(3) The manufacturer should be consulted about the quality assurance of speciality IGUs defined in (a) to (k).

4 GLAZING

Glazing shall be in accordance with AS/NZS 4666, section 3.

NOTE – Information is also provided in AS/NZS 4666 as follows:

(a) Appendix E – Principles of glazing;

(b) Appendix F – Glazing methods;

(c) Appendix G – Storage, handling, transport, and preservation.

5 QUALITY ASSURANCE

5.1 Testing

5.1.1 General

This section sets out the system testing requirements for insulating glass units.

The units shall be tested by an independent, recognised testing facility and test results shall be available on request.

NOTE – Long-term testing regimes covered in 5.1 differ from daily factory floor periodic testing covered in 5.2 in that the testing regimes expose completed and fully cured units to long term cyclic, accelerated weathering, and UV tests that utilise laboratory-based criteria. This is often known as 'type testing' or IGU 'system testing', and the actual components used to make the IGU are defined in the 'system description' as part of the test procedure.

5.1.2 Test standards

5.1.2.1

Insulating glass units shall be tested in accordance with either:

(a) ASTM E2188; or

(b) BS EN 1279-2; or

(c) ISO 20492-1.

5.1.2.2

Gas filled insulating glass units shall also be tested in accordance with the principles and procedures specified in either:

(a) BS EN 1279-3; or

(b) ISO 20492-3.

5.1.2.3

Insulating glass units shall also comply with the principles and procedures in either:

(a) ASTM E2189 and E2190; or

(b) BS EN 1279-1 and BS EN 1279-4; or

(c) ISO 20492-2 and ISO 20492-4.

NOTE – Independent, third-party product certification may be used by a manufacturer to demonstrate ongoing manufacturing compliance of insulating glass units against the manufacturer's quality system and this standard (see 5.2).

5.1.3 Acceptable period between tests

Compliance testing in accordance with 5.1.2 shall be conducted at least every 2 years.

NOTE – Test results will normally be for 'system testing' and not the actual IGU system description used for each project.

5.2 Quality assurance procedures

Quality assurance testing and recording criteria for components and the assembly of insulating glass units shall comply with:

(a) AS/NZS 4666 section 5; or

(b) The principles and procedures set out in BS EN 1279-6.

NOTE – Compliance is normally achieved by third party certification. The Insulating Glass Unit Manufacturers' Association (IGUMA) BS EN 1279-6 manual is an example of this certification.

5.3 Marking

Insulating glass units shall be permanently and clearly marked.

As a minimum, marking shall include the following:

(a) Manufacturer's or supplier's name or trademark; and

(b) The date of manufacture (use the year as the minimum).

NOTE –

(1) Marking is normally at the edge of the IGU and within the glazing rebate so the unit can be identified in case of failure. Therefore edge labels within the glazing rebate are considered to be permanent.

(2) Additional marking may be used by the manufacturer.

NOTES

Approved by the Standards Council on 19 February 2016 to be a New Zealand standard pursuant to the provisions of section 10 of the Standards Act 1988.

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The following references relate to this standard:

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