



# Laminated Glass Product Specification

## QF031

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DOCUMENT**

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# 1. Product Name

DMS Laminated Safety Glass - AS/NZS 2208:1996 (Safety glazing materials in buildings). Also trading as ENVIROLAM™.

## 2. General Description

Laminated glass consists of two or more glass lites bonded together by a sheet of polyvinyl butyral (PVB) plastic interlayer between each glass lite. The PVB interlayer between the glass lite provides numerous advantages for its used and in particular, its safety aspect. The PVB holds together the dangerous glass splinters and sharp edges of fractured glass, thus minimizing the risk of injury.

## 3. Intended Applications

DMS Laminated Safety Glass is used in applications where safety is important against impact.

## 4. Raw Material Specification

### 4.1 Input Glass

Pre-Laminated Glass is supplied to the minimum Glass Standard for Clear, Tint, Reflective or Figured Rolled as manufactured by local or overseas manufacturers.

## 5. Physical Characteristics

### 5.1 Tolerances

#### 5.1.1 Size Limitations

The limitations on size on the laminating line are:

Maximum Size            5000 x 2200 mm

Minimum Size            900 x 600 mm

For sizes outside these limitations, technical approval is required, refer to Operations Manager.

#### 5.1.2 Dimension Tolerances

All dimensions  $\pm 2$ mm unless otherwise specified. The thickness of glass substrate shall be within  $\pm 0.2$ mm of nominal for 4-6mm glass,  $\pm 0.3$ mm of nominal for 8-12mm glass,  $\pm 0.5$ mm of nominal for 15mm glass and  $\pm 1.0$ mm of nominal for 19mm glass, unless otherwise specified.

The thickness of interlayer shall be within  $\pm 0.03$ mm per 0.38mm interlayer.

**5.1.3 Squareness**

Difference in diagonals of panel to be no more than 4mm. The overall shape of the glass must fit within a box  $\pm 2$ mm of the true nominal size.

**5.1.4 Overall Bow**

The following standards for bow are in accordance with AS/NZS2208:1996. Bow and Warpage shall be checked on the long edge using a straight edge with the panel standing within 5° of vertical.

Substance	Standard Laminating	Laminated For Multi Glazing	Laminated Toughened Glass
5 & 6mm	1 in 350, 6mm maximum	1 in 400, 5mm maximum	1 in 400, 5mm maximum
8, 10 & 12mm	1 in 400, 5mm maximum	1 in 450, 4mm maximum	1 in 450, 4mm maximum
15, 19mm	1 in 500, 5mm maximum	1 in 600, 4mm maximum	1 in 600, 4mm maximum

**5.1.5 Edge Quality**

Laminated glass shall have a minimum standard of edgework such that:-

- (a) Flared or splayed edges are not acceptable - except for the end of score up to a maximum size of 3mm.
- (b) Scallops, flakes, shells and chips are permitted up to a maximum of 3mm.
- (c) ‘Shark’s teeth’ are not to extend to more than 50% of the thickness of the glass substrate.
- (d) Shells are not acceptable on Flat Polish, Flat Smoothed or Mitred processed edges.
- (e) Broken corners and corners on/off are not permitted
- (f) Vented edges are not permitted

**5.1.6 Localised Warp**

Localised bow or kinks is not to exceed 1 in 200 for nominal thickness 5, and 6mm and 1 in 300 for substances greater than 6mm.

**5.1.7 Misalignment**

Edge misalignment between panels shall be no more than 2mm. Misalignment in holes shall be no more than 2mm for heat strengthened or toughened laminates.

## 5.2 Standards Requirements

Laminated Safety Glass for Buildings is tested in accordance with AS/NZS 2208:1996, the Australian / New Zealand Standard for Safety Glazing Materials in Buildings. Every production run of laminated glass is sampled to Appendix A and tested to clause 3.2 & 3.4 using the procedure outlined in Appendix D & F of AS/NZS 2208 :1996.

Laminated Safety Glass is supplied to conform to AS/NZS 4667:2000, the Australian / New Zealand Standard for Quality Requirements for Cut-to-Size and Processed Glass.

### 5.2.1 Traceability and Standards Markings

Laminated Safety Glass is marked with a tradesticker using a temper proof sticker which is removed from the glass when identified. This tradesticker contains information necessary for the standards requirements as well as traceability information as follows:

#### **Traceability Code:**

#### **- Batch Numbering**

**xxx - yyy - zzz**

**xxx** - refers to the day of manufacture

**yyy** - refers to the year of manufacture

**zzz** - refers to the autoclave run number

*Example:*

**051-98-83**

**Means: manufactured on the 51st day of 1998 in the 83rd autoclave run.**

## 5.3 Performance Characteristics

### 5.3.1 Visual Distortion and Surface Quality

The standard for laminated glass is based on the faults being not readily visible at 3 meters when viewed perpendicular to the surface and as the glass would normally be viewed. The following guide-lines assist in the inspection of the glass when it can not be viewed from 3 meters.

#### 5.3.1.1 Digs

Digs are not permitted.

#### 5.3.1.2 Scratches

- o Scratches less than 75mm in length and less than 0.5mm in width are allowable.
- o Heavy scratches less than 75mm in length and less than 0.75mm in width are permissible if within 100 mm of the glass edge.

#### 5.3.1.3 Stones

- o No stones greater than 2mm is permitted.
- o Stones 1mm to 2mm in size, one stone allowed in 4m<sup>2</sup>.
- o Up to 3 stones below 1mm in diameter are allowed in 4m<sup>2</sup>.

Where the glass is coated, a different set of guide-lines apply.

#### 5.3.1.4 oeam and Other Linear Distortion

- o oeam and other linear distortion are not permitted.

#### 5.3.1.5 Surface Vent and Blisters

- o Surface vent and blisters are not permitted.

#### 5.3.1.6 Stains

- o Stains are not permitted.

### 5.3.2 Spot Defects in the Vision Area

Inspect the laminated glass held in a perpendicular position and in front of and parallel to a matt grey screen, lit by diffuse daylight or equivalent at a distance of 2m from the glass. The spot defects in the vision area when viewed from 2m shall not exceed the number of the permissible defects in table below.

Defects less than 0.5mm are not considered and defects greater than 3mm are not permitted.

Size of defect d in mm		$0.5 < d \leq 1.0$	$1.0 < d \leq 3.0$			
Size of pane A in m <sup>2</sup>		for all sizes	$A \leq 1$	$1 < A \leq 2$	$2 < A \leq 8$	$A > 8$
Number of permissible defects	2 panes	No limitation, however no accumulation of defects	1	2	1/m <sup>2</sup>	1.2/m <sup>2</sup>
	3 panes		2	3	1.5/m <sup>2</sup>	1.8/m <sup>2</sup>
	4 panes		3	4	2/m <sup>2</sup>	2.4/m <sup>2</sup>
	≥ 5 panes		4	5	2.5/m <sup>2</sup>	3/m <sup>2</sup>

Note: An accumulation of defects occurs if four or more defects are at a distance of < 200mm from each other. This distance is reduced to 180mm laminated glass consisting of three panes, to 150mm laminated glass consisting of 4 panes and to 100mm laminated glass consisting of five or more panes.

### 5.3.3 Defects in the edge area for framed edges

Inspect the laminated glass according to Section 5.3.2, defects which do not exceed 5mm in diameter are permitted in the edge area. For panes sizes  $\leq 5\text{m}^2$  the width of the edge area is 15mm. The edge area width is increased to 20mm for pane sizes  $> 5\text{m}^2$ . If bubbles are present, the bubbled area shall not exceed 5% of the edge area.

### 5.3.4 Defects on edge which will not be framed

Bubbles, interlayer defects and retractions are permissible if they are not readily visible at 2m when viewed according to Section 5.3.2.