

Product Specification

K&K Standard & Performance range of Insulated Glass Units

1. Standards Compliance

K&K's Standard and Performance range of Insulated Glass Units are supplied in accordance with this Product Acceptance Standard and conform to the following Australian Standards.

- AS/ NZS 2208 "Safety Glazing Materials in Buildings"
- AS/ NZS 2080 "Safety Glass for Land Vehicles"
- AS 1288 "Glass in Buildings-Selection & Installation"
- AS/ NZS 4667 "Quality requirements for cut to size and processed glass"
- AS/NZS 4666 "Insulated Glass Units"

2. Identification Label

All K&K Glass Insulated Glass units supplied with toughened or heat strengthened glass will be supplied with the K&K glass stamp or label, unless this is specifically not requested by the customer at the time the order is placed. This K&K glass stamp or label verifies that the glass was manufactured by K&K Glass and the glass thickness and quality conforms to AS/NZS 2208 or AS/NZS 2080 standards certification.

3. Product Range

- Standard Insulated Glass Units
- Performance Insulated Glass Units

4. Size, Range & Tolerances

- Minimum Size: 300mm x 300mm
- Maximum Size: 4000mmL x 2200mmH (Refer to sales for custom sizes)
- Maximum Weight: 350kg/m² per panel
- Unit Thickness: 12mm to 47mm
- Spacer Thickness: 6, 8, 10, 12, 14, 16, 18 and 20mm
- Shapes: Are available but limited based on angles of shapes

For Custom requirements outside of the above specifications technical approval is required, please refer to the operations Manager.

5. Minimum Charge

Minimum area charge of 0.5m² per panel applies / Minimum order charge of \$300.00 applies.
Simple shapes incur 15% surcharge // Complex shapes incur 40% surcharge

6. Dimensional Tolerances

All dimensions (Length / Width) $\pm 2\text{mm}$ for completed units unless otherwise specified. Individual; squares of glass cut for use in the same insulating glass unit shall be within 1.0mm of each other's dimensions.

6.1 Thickness Tolerance:

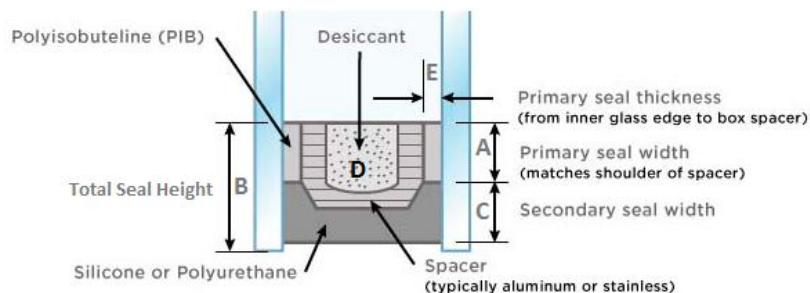
Nominal Thickness	Annealed Float, Heat Strengthened & Toughened	Laminated
3	$\pm 0.2\text{mm}$	
4	$\pm 0.2\text{mm}$	
5	$\pm 0.2\text{mm}$	4.6 - 5.4mm
6	$\pm 0.2\text{mm}$	5.6 – 6.4mm
8	$\pm 0.3\text{mm}$	7.6 – 8.4mm
10	$\pm 0.3\text{mm}$	9.6 – 10.4mm
12	$\pm 0.3\text{mm}$	11.6 – 12.4mm

Note: The thickness ranges specified for laminated glass types excludes interlayer

6.2 Total Unit Thickness:

- $\pm 1.0\text{mm}$ for two panes of glass each being 6mm or less plus air space
- $\pm 1.0\text{mm}$ for two panes of glass each being 6mm or less plus air space

6.3 Dimensions of Edge Seal:



Designation	Function	mm
A	Primary Seal (PIB)	4
B	Total seal height	10
C	Secondary seal beneath Spacer (Polysulphide or Silicone)	3.5
D	Primary Seal Thickness v(PIB)	0.25
E	Desiccant	

6.2 Squareness:

To be determined by adherence to requirements for substrates in accordance with AS/NZS2208:1996 & AS/NZS 4667:2000 and difference in diagonals of rectangular panel to be no more than 5mm where the largest dimension is less than 1200mm and 10mm for all other panels.

6.3 Misalignment / Offset:

Glass to be lined up as close to exactly as possible to ensure unit cures with no “slippage stress” on the primary and secondary seals. Misalignment between two panes of glass shall be less than 1.0mm on the bearing edge of IGU.

6.4 Bow:

To be determined by adherence to requirements for substrates in accordance with AS/NZS2208:1996 & AS/NZS 4667:2000. Bow and Warpage shall be checked on the long edge using a straight edge with the panel standing within 5° of vertical.

Nominal Thickness	Annealed Float, Heat Strengthened & Toughened	Standard Laminating	Toughened Laminated Glass
4mm	1 in 300, 7mm Max.	-	-
5 & 6mm	1 in 350, 6mm Max.	1 in 400, 5mm Max.	1 in 400, 5mm Max.
8, 10 & 12mm	1 in 400, 5mm Max.	1 in 450, 4mm Max.	1 in 450, 4mm Max.
15 & 19mm	1 in 500, 6mm Max.	1 in 600, 4mm Max.	1 in 600, 4mm Max.

6.5 Holes:

Misalignment of holes is acceptable, provided it does not exceed 2mm.

7. Visual Faults / Surface Quality

The standard for IGU is based on the faults being not readily visible at 3 meters when viewed perpendicular to the surface using daylight without direct sunlight, or with a background light suitable for observing any imperfections and as the glass would normally be viewed.

The glass is to be inspected in transmission (looking through the glass). Scratches, scars, surface marks and imperfections are acceptable if not readily visible from 3 metre viewing distance.

8. Edge Quality

All glass for use in IGU shall have a minimum standard of edgework such that:-

- a) Any damage caused to the edge after furnacing is not acceptable.
- b) Scallops are permitted up to a maximum of 3mm.
- c) Shells are acceptable in toughened glass that have been ground for furnacing provided they extend no greater than 5mm from the plate edge.
- d) Shells are not acceptable on Flat Polish, Flat Smoothed or Mitred processed edges.
- e) Flared or splayed edges are not acceptable in laminated glass - expect for the end of score up to a maximum size of 3mm.

9. Localised warp

To be determined by adherence to requirements for substrates in accordance with AS/NZS2208:1996. Localised bow or kinks is not to exceed 1mm over any 200mm span.

10. Secondary Seal

All K&K IG units are supplied standard with Polysulphide as the secondary seal. Structural silicone is available upon request.

It is strongly recommended that structural silicone be specified as the secondary seal on K&K Glass IGU's in applications where the secondary seal is exposed to UV including but not limited to butt joints, overhead installations or shallow rebates etc; the integrity of the IGU may be compromised and potentially will void the warranty.

It is also suggested reading this in conjunction with the K&K Glass Technical Glazing specification for IGU's.

11. Performance Characteristics

11.1. Visual Distortion

11.1.2 Roller Wave Distortion

An inherent consequence of the heat treatment process is roller wave which is caused by the heated, slightly softened glass being in continual contact with the oscillating ceramic rollers.

This distortion is more noticeable in reflective or dark tinted glasses and if applicable, the direction of roller wave should be specified.

Evaluation of the level of distortion that is caused by the furnacing process is a subjective judgement. The use of a Roller wave Gauge to measure the surface profile of the glass will give a good indication of the level of visual distortion in the glass. The standards for visual distortion are based on a surface profile that will result in an acceptable level of visual distortion. The roller wave is measured from peak to trough and maximum standards are as follows:

Substance	Custom Toughened Glass	Toughened Glass for Laminating	Toughened Glass for MultiGlazing
4mm	0.14mm	0.1mm	0.14mm
5 & 6mm	0.14mm	.01mm	0.14mm
8, 10 & 12mm	0.14mm	0.08mm	0.14mm
15 & 19mm	0.14mm	0.08mm	0.14mm

11.1.3 Photoelasticity or Anisotropy (iridescence)

The variation of stress across the surface of toughened glass due to the toughening process can result in light and dark areas being visible (sometimes known as 'leopard spots') when polarized light is incident upon the glass. This phenomenon is known as photoelasticity and the intensity of the visible photoelastic pattern depends upon the degree of polarization of light and the glass thickness. This photoelastic effect is an inherent characteristic of all heat treated glass and is not a cause for rejection.

The photoelastic effect is more noticeable either at a glancing angle or through polarized spectacles.

11.1.4 Newton's Rings

In a large IGU, the two glass panes may be so displaced by air pressure as to touch in the middle. If this happens, then Newton's Rings may be visible in this area. They are roughly circular, coloured bands like oil films on water, but normally less intense in colour. They occur only near the centre of a unit and cannot appear if the cavity, internal pressure and/or glass thickness is sufficient.

11.1.5 Brewsters Fringes

Brewsters Fringes are not a fault. They can occur only with very high quality float glass IGUs and are the consequence of the thickness of the two glasses being so accurately similar and

their surfaces so flat, that the multiple reflections of light within one glass can combine with those similarly reflected within the other, with such small path differences as to cause interference. The effect is of faint coloured bands or irregular shapes, which can be located anywhere over the surface. It is rarely noticeable in normal lighting conditions.

11.1.6 Deflection and Reflection

With typical IGU constructions, quite small changes in temperature and pressure are sufficient to cause significant changes in the images reflected from the windows due to glass deflection. Usually the appearance is of a convex (pincushion) distortion when the glass is bowing outwards and a concave (dished) distortion when bowing inwards. These ever-changing distortions are superimposed on any small local edge deflection due to variation in manufacture or glazing of the unit. They are an inevitable consequence of the laws of physics and cannot be eliminated.

12. Inspecting Surface Quality (within 2M)

The standard for IGU is based on the faults being not readily visible at 3 meters when viewed perpendicular to the surface using daylight without direct sunlight, or with a background light suitable for observing any imperfections 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.

12.1 Digs

Digs are not permitted.

12.2 Scratches

Scratches less than 75mm in length and less than 0.5mm in width are allowable.

12.3 Furnace Pick up

- The furnace Pick-up is not to exceed 3mm in diameter.
- More than 3 Pick-up markings between 1 and 3 in diameter per plate is unacceptable.
- Any number of Pick-up markings below 1mm in diameter is allowed. Where the glass is coated, a different set of guidelines apply.

12.4 Heat Markings and “Orange Peel”

Heat markings or “Orange Peel” is acceptable if not visible from 3m when viewed between an angle normal to the glass and 45° to the glass.

13. Specification of Primary seal (PIB-969)

PIB-969 is a solvent free, permanently plastic and load depending deformable one component adhesive/sealant based on polyisobutylene (PIB), which does not cure. The material is remarkably softened by heat. The adhesion is physical; final adhesion is obtained after a press procedure.

Base	Polyisobutylene (PIB)
Colour	Black
Odor	Ordorless
Consistency	Permanently Plastic
In service temperature range	-30°C to +80°C
Density	Approx. 1.25g/cm
Thermal Conductivity	0.2W/(m.k)

14. Specification of Metal Spacer

Thermotech® IGU is separated by a metal spacer and the cavity of the spacer is filled with desiccant. Spacer material: Aluminium

- Spacer Colour: Black
- Thermal Conductivity: 160W/(m.k)

15. Specification of Desiccant (Molecular Sieve 3A)

Molecular Sieve 3A is a highly porous, crystalline alkali metal aluminosilicate in beaded form. It's the potassium form of the type A crystal structure. The pore opening in the crystals have a diameter of approximately 3A (3 angstroms).It's large enough to allow in moisture, but excludes molecules such as unsaturated hydrocarbons, which can potentially from polymers.

Typical Chemical Formula - $K_{72}Na_{48}[(AlO_2)_{12}(SiO_2)_{12}] \cdot xH_2O$

Property	Unit	Specification
Appearance		Bead
Total Volatile (575°C,1 hr)	%	1.5 max.
H ² O-Adsorption Capacity (*24h)	%	20.0 min
dust	ppm	40 max.
Bulk Density	g/l	700 min
Delta T (20g/20g)	°C	35 min
<ul style="list-style-type: none"> • Lbs H²O/100 lbs activated absorbent at 17.5mmHg, 25°C, 60% RH 		

Pease note:

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