

Australian Standard (AS) 4666 Insulating Glass Units is referenced in AS 1288 Glass in Buildings and therefore a secondary reference of the National Construction Code (NCC). This means compliance with AS 4666 is a **mandatory** requirement for all manufacturers supplying windows incorporating IGU's.

### **Did You Know?**

- For all glass products, Australian Standard AS 1288 provides a Deemed-to-Satisfied solution for the NCC.
- For insulated glass units (IGU) to comply with the requirements of AS 1288, they must be compliant with AS 4666.
- There are a series of tests that all IGU manufacturers must subject their products to for compliance with AS 4666.
- All IGU's supplied in the Australian market must comply with AS 4666 (including meeting all testing requirements) whether manufactured domestically or imported.
- If your IGU supplier cannot certify compliance with AS 4666 you may not be complying to the requirements of the National Construction Code.

AS 4666 provides a minimum performance framework to assess the durability of IGU's, therefore ensuring that manufacturers have the processes in place to replicate manufacture of IGU's that have proven, tested performance reliably.

### **AS 4666 Testing Requirements**

**Independent Long-term testing** – Consists of testing sample IGU's as to the compliance requirements outlined in various international standards as called up in section 2 "Long-term type testing" of AS 4666. IGU manufacturers need to provide evidence that their type tested units have passed the requirements of the test procedures in the nominated international testing standards. Type testing consist of:

- Conditioning of the 15 sample units required for each type of IGU tested.
- Measuring the Gas density in each of the samples manufactured with gas. (optional test.)
- Selecting 5 samples to be placed in the long term accelerated weathering chamber.
- Those five samples are subjected various climate cycles over a 13-week period inside the chamber.
- The weather cycles include temperatures as high as 58 degree C, at < 95% humidity and as low as -18-degree C.
- Four IGU'S that have not entered the accelerated chamber are then pulled apart, so that the moisture adsorbent materials used can be tested for moisture content.

- Once the 5 units have completed their 13 weeks in the accelerated weathering chamber, they are measured again for gas density, and then pulled apart so that the moisture adsorbent materials used can be tested for moisture content.
- The moisture content of the units that had been in the cabinet and then those that had not been analysed ensuring moisture does not on average exceeded an increase of 20% and no individual unit had exceeded 25%.
- Essentially this testing ensures if the units are manufactured well that the primary and secondary seals provide an adequate barrier to keep the IGU's integrity intact, ensuring longevity of the product.



Figure 1: Long term accelerated weathering testing chamber and facilities

Long term re-testing of the IGUs needs to be conducted every 2 years, to demonstrate continued compliance to the specified international standards as outlined in clause 2.2.1 of AS 4666.

**On-going (production) testing** – Mandatory daily QA process includes maintaining documented shift records of all key components to ensure processes are controlled and predictably replicated. These tests include these steps:

- Testing that sealants are completely mixed and adhere to the glass and spacer as per the specification. The test procedure for the adhesion of the primary and secondary seals to assess consistency of the sealant quality in the manufactured product includes sealants mix ratio, mix homogeneity and cure rate to be tested in accordance with the methods described in AS 4666.



Figure 2: Testing of sealant adhesion

- Testing to measure the moisture absorbance performance of the desiccant to check that the desiccant is working to specification and has not been exposed to moisture. Desiccant has the function to trap any moisture in the cavity during manufacture and hold it for the life of the IGU.



Figure 3: Testing of moisture absorbance performance of the desiccant

- The desiccant fill test is to demonstrate that sufficient quantity (volume) of moisture adsorbing materials (desiccant) is being placed into the spacer where applicable.
- Testing that the dew point on selected units are completed. This test is to check the moisture content within a completed unit air space to assess the effectiveness of the desiccant in a completed IGU. No moisture to be remained unabsorbed in the unit.



Figure 4: Testing of assessment the effectiveness of the desiccant

- Testing to check that the spacer bar is free of surface contaminants such as dirt, oil and grease as these substances effect adhesion levels of sealant materials. If there are any obvious signs of contaminants, the spacer shall be cleaned or discarded.
- Assessing via visual inspection that seal (primary and secondary) dimensions, edge clearance (between 3-6mm), edge cover (minimum 12mm), front clearance and back clearance

- (minimum 2mm) are as per specification. IGU purchaser can also assess the level of workmanship of the unit by inspecting the primary and secondary seals.

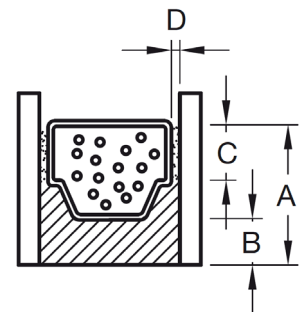
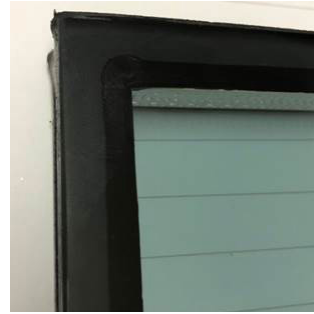


Figure 5: Dual seal IGU components

Table 1: Minimum sealant dimension for dual seal IGU (AS 4666)

Sealant Type	A (mm) total depth of seal	B (mm) beneath spacer depth	C (mm) primary seal depth	D (mm) primary seal thickness
Hot melt	10	4	3.5	0.25
Polysulphide	10	4	3.5	0.25
Polyurethane	10	4	3.5	0.25
Silicone	10	4	3.5	0.25

Compliant manufacturers can demonstrate that their processes are appropriate and certified by submitting their factory records and processes to external audits conducted in accordance with ISO 17020 by an accredited certifying organization, who will issue a general AS 4666 product certification.

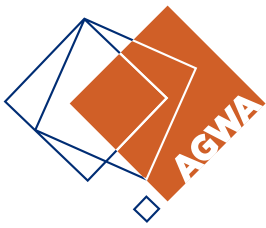
### **Labelling and Certification**

Manufactured IGUs must carry a permanent identifier, marked in a visible location (usually on the internal spacer or applied to the glass edge and visible when glazing beads are removed.). The label must show:

- Manufacturer's or supplier's name or trademark, and a unique manufacturing site identifier.
- Reference to AS 4666.
- The date of manufacture, including month and year.



Figure 6: An example of the compliance marking



## **Conclusion**

To ensure windows and glazing contractors can fully comply to both AS 2047 and AS 1288, it is vital that your IGU manufacturer can prove that they have the documented shift processes and long term testing in place, which will also provide assurance that they have been made to internationally recognized and audited standards. This will also give you confidence that the product will meet long term performance and warranty periods.

## **The Role of IGMA**



The Insulating Glass Manufacturers Alliance (IGMA), is a subcommittee of AGWA and represents most major manufacturing sites of IGU within our Industry. IGMA has been instrumental in advocating greater controls over the manufacturing of IGU's and to ensure they are made to similar international standards in both Europe and North America. As part of manufacturing membership of IGMA, members are required to hold compliant testing and accreditation for all of their manufacturing sites.

AGWA recommends that you look for an AS 4666 accredited IGMA supplier as your guarantee of confidence that your supplier has sufficiently invested in systems and controls to ensure compliance with the relevant Australian Standards and the quality of the manufactured IGU.

Disclaimer: This key message has been developed to provide general guidance, awareness and education to AGWA members only. It should not be viewed as a definitive guide and should be read in conjunction with the requirements of the National Construction Code (Visit [www.abcb.gov.au](http://www.abcb.gov.au)). While every effort has been made to ensure the information is accurate the AGWA expressly disclaims all and any liability to any person for anything done in reliance on this publication. No responsibility is accepted by the AGWA for any mistakes, errors or omissions in this publication.

## **Australian Glass and Window Association (AGWA)**

a: Pymble Corporate Centre, Suite 1, Level 1, Building 1, 20 Bridge Street, Pymble NSW 2073  
t: +61 2 9498 2768 f: +61 2 9498 3816 e: [admin@agwa.org.au](mailto:admin@agwa.org.au) w: [www.agwa.com.au](http://www.agwa.com.au)