

1.0 INTRODUCTION

The Insulating Glass Manufacturers Alliance (IGMA) administers a voluntary certification program for sealed insulating glass units that comply with the requirements of the CGSB 12.8 standard and the IGMA Gas Concentration Certification Program. The complete requirements of the Program are contained in the document titled "IGMAC Certification Program" (current edition identified on document).

On behalf of the IGMAC Certification Program, the auditor conducts two types of audits: Facility Audits and Compliance Audits. A Facility Audit is conducted primarily to document the construction of samples required for testing under the Program (ie. prior to certification, and within the required re-certification cycle thereafter).

The required re-certification cycle for this program is every two years to qualify the program for listing with the National Fenestration Rating Council (NFRC) program.

After certification has been granted by the IGMAC Certification Program Administrator, Compliance Audits are conducted to verify that construction of certified IG units has not changed, and that other specific requirements of the Program are being met.

2.0 GENERAL INSTRUCTIONS FOR AUDITORS

- 2.1 Audits shall only be conducted upon specific direction from the individual designated as the IGMAC Certification Program Administrator, who will advise the appropriate Auditor's field office for coordination with their field officers. The IGMAC Program Administrator shall provide a completed audit form with the necessary manufacturer and product code information. Any specific instructions as to which kind of audit is required for each participating facility involved will also be noted. (In special circumstances, the program application form may be provided in lieu of the audit form).
- 2.2 In the event that a facility audit report has been issued, the Auditor is to contact the manufacturer in advance to schedule a mutually agreed upon date and time. Compliance audits are unannounced.
- 2.3 The auditor shall always carry a current copy of the IGMAC Certification Program document.
- 2.4 Upon arrival at the manufacturing location, the auditor shall identify her/himself and ask for the specified contact person or alternate representative shown on the audit form and advise that he/she is present to conduct an audit in accordance with the IGMAC Certification Program. The facility audit is scheduled in advance with the manufacturer. Compliance audits are unannounced.
- 2.5 The auditor shall ensure that (s)he is accompanied at all times by a representative of the manufacturer during the audit. **No suppliers are permitted in the plant facility during a facility audit.**
- 2.6 The audit form shall be completed in ballpoint pen and in a clear and complete manner.
- 2.7 It is the role of the auditor to record the required and requested information. The auditor has no authority to make decisions on certification of product or actions to be taken by the manufacturer to comply with the requirements of the Program. The auditor may provide

information to the manufacturer regarding program requirements based on, and with reference to the Program document. The manufacturer shall be referred to the IGMAC Administrator for any decision or direction.

- 2.8** During a facility audit, it is the responsibility of the manufacturer to have sufficient quantities of 4 mm glass to complete fabrication. The auditor shall verify the glass thickness and air space gap for program compliance.

3.0 FACILITY AUDITS

3.1 General

Facility audits involve witnessing the manufacture of small 350 x 500 mm (14" x 20") insulating glass units for forwarding to the test laboratory for testing, verifying the maintenance and documentation of required quality assurance checks, and recording the required and requested information.

Units fabricated and submitted by the manufacturer for certification testing must reflect the manufacturer's actual production unit configuration in all respects.

- 3.1.2 During any facility audit, only employees of the firm being audited shall be present with the auditor.
- 3.1.3 Upon signing the completed audit report, the manufacturer/licensee is testifying that at no time during the 24-hour period preceding the fabrication of test specimens was an employee or representative of any insulating glass component supplier, whether currently supply product(s) to the manufacturer/licensee or not, working on, making modifications and/or improvements to or providing maintenance on the product line and/or equipment from which units submitted for testing are fabricated.

3.2 Procedure

- 3.2.1 Upon notification from the IGMAC Program Administrator, an auditor will be assigned for the facility audit, and be provided with the audit form.
- 3.2.2 The assigned auditor will contact the manufacturer and agree upon an audit date. To avoid excessive travel costs, the facility audit will be scheduled with routine inspections in the area, if possible.
- 3.2.3 The auditor shall witness the manufacture of the 20 ~ 24 (minimum / maximum) actual test units required for testing, and shall verify that:
- a) the test units are being manufactured in accordance with the following applicable portions of CAN/CGSB 12.8: "One set of specimens comprising at least 20 insulating glass units, with outside dimensions 350 x 500 mm (± 5 mm) and hermetically sealed cavities of at least 12mm for double-glazed units and 6mm each for triple-glazed units. If the units are to be tested for argon gas concentration, then all 20 units must be filled with argon gas and sealed as per the normal procedure. All argon gas measurements are conducted by Spark Emission Spectrography (SES). One lite of a double-glazed unit must be an optically transparent sheet or float glass with or without a coating to facilitate dew point measurements. For triple-glazed test specimens, the Low-e coating must be on the center lite in order to facilitate non-destructive gas testing. Each lite of glass shall have a 4 mm nominal thickness. The overall thickness of a sealed unit for testing shall not exceed 40 mm to accommodate existing apparatus. The specimens shall be fully representative of manufacturer's standard production units with regard to design and construction including 4 test samples with cavity materials such as but not limited to grills, muntins, films, decorative inserts, blinds etc. It is recommended that the

manufacturer obtain a copy of the CGSB 12.8 standard to ensure all requirements of the standard are met.

- b) if a manufacturer is gas filling IG units, the corresponding test units must be constructed for gas filling and units are required to be gas filled for the determination of initial and final gas concentration levels under the standard test method for determining argon gas concentration and be manufactured with Low E coating. Gas testing is non-destructive using the SES methodology. The ten units tested for gas content are the 4 weather-cycled units plus 6 of the high humidity units. Initial and after gas content testing will be conducted on the same samples. Units fabricated with cavity materials are NOT tested for high, humidity, weather cycling or gas content.
- c) Internal components may include but are not limited to blinds, films, decorative glass inserts, grills and muntins. When testing muntins or grills, test samples shall be fabricated dividing the sample into 1 X 1 offset, with 4" as demonstrated in Figure B2-1, Muntin Bar Test Sample Configuration .

It is recognized that a given company may utilize numerous Internal Components (IC) in production units and it is not practical to regularly test all IC variations. The following shall serve as a guide the manufacturer and auditor in selection of the IC to be tested:

- Favor shall be given to testing worst case IC
- Favor shall be given to testing highest volume production IC
- Consideration shall be given to testing IC on a rotational basis

The following direction is also provided:

Muntins or Grills - When testing muntins or grills, test samples shall include all components of the muntin or grill system (i.e. holes, clips, brackets) and shall be fabricated dividing the sample into 1 X 1 offset, with 4" as demonstrated in Figure B2-1, Muntin Bar Test Sample Configuration).

For multiple cavity test samples, muntins or grills should be included in all cavities if actual production units have muntins or grills in all cavities. Multiple cavity test samples shall include the same number and placement of Low e coatings as production units. Units with cavity materials will be tested only for volatile fog.

- d) If the optional initial seal test is requested or not, auditor shall so note on audit form in space provided.
- 3.2.4 The construction details related to gas filling, and the gas type used in production, shall be recorded on the audit form (if applicable).
- 3.2.5 The auditor shall note on the audit form, under Auditor notes, if the manufacturer is currently using "low E" glass in production. Test samples prepared for argon gas concentration testing must be manufactured with Low-E coating if the manufacturer's actual production units are manufactured with Low-E coating. Special fabrication regarding the Low E coating is required for triple and quad glazed units. Manufacturers are to contact the IGMAC approved test facility of their choice for instructions. Special instructions are available from the IGMAC office regarding fabrication of quad glazed units.
- 3.2.6 The auditor shall record the product codes on the audit form for each of the actual components being used in the assembly. (S)he shall carefully review the product codes with the manufacturer's contact person, and shall make appropriate notation on the audit form if there is any discrepancy between the components being used and the component codes shown on the form by IGMAC.

Note: From time to time new developments in components, that were not considered in the development of current component codes, can cause uncertainty in the appropriate code to record. If there is any uncertainty as to the appropriate code to use, for this or any other reason, the auditor shall make appropriate notation on the audit form and include the trade name if available, appending additional information as necessary so as to ensure clarity. **The manufacturer's representative is to endorse note as recorded on form.**

- 3.2.7 The auditor shall place the non-removable identification label on an outside glass surface of each of the 20 or 24 IG test units, locating the label in a corner rather than toward the center of the glass. The auditor shall initial and date each identification label.
- 3.2.8 The auditor shall review the status of the manufacturer's Q.C. records program, recording the status of each record on the audit form. Auditors are to refer to Appendix F: In-Plant Quality Control Requirements and Appendix G: Quality Control Forms.
- 3.2.9 The auditor shall sign and date the completed audit form and shall have the manufacturer's representative also sign in the space provided and initial the "Permanent Mark" section of the form reserved for the identifying certification mark. If this area is blank, the auditor is to provide the manufacturer's certification mark. The auditor shall leave a copy of the completed audit form with the manufacturer who must include a copy with the shipment of test units to the test laboratory.

The auditor shall return the original copy of the audit report form to the serving regional audit office. The inspector should make an additional copy for his/her records. The serving office will submit the original of the completed audit form to the IGMAC Program Administrator.

- 3.2.10 Following the facility audit and prior to departure from the manufacturing facility, the auditor shall inform the manufacturer that they have 90 days from that date forward to have sample units shipped to an IGMAC approved test facility for testing in order to remain in compliance with the Certification Program. For identification and lot traceability, a copy of the auditor's facility audit report is to be included with the test samples shipped to IGMAC approved test facility. The IGMAC approved test facility will advise the IGMAC Program Administrator upon receipt of the test units for recording and administrative purposes. A list of IGMA approved test facilities is included on the Audit Report form.
- 3.2.11 The auditor shall inform the manufacturer that all test samples shall be forwarded directly to the IGMAC approved test facility within the allotted time period. The auditor will inform the manufacturer that there shall be no "pre-testing" of any test sample being forwarded to the approved test facility except for normal in plant quality control inspection processes performed by the manufacturer and at the manufacturer's discretion.

4.0 COMPLIANCE AUDITS

4.1 General

- 4.1.1 Compliance audits are unannounced. Their purpose is to provide IGMAC with the information required to determine whether the manufacturer is continuing to produce IG units with the same components and materials to those for which IGMAC has granted certification, to verify the maintenance and documentation of quality assurance checks required by the program, to verify that certified units are being properly identified/marked, and to record the required and requested information.

4.2 Procedure

- 4.2.1 Upon notification from the IGMAC program administrator, an auditor will be assigned for the compliance audit, and be provided with the audit form.
- 4.2.2 The assigned auditor will NOT contact the manufacturer in advance of the audit except that in exceptional cases, and only with the approval of the IGMAC Certification Program

Administrator, the following is permitted:

If the manufacturer is located in a particularly remote area, or is known to produce IG units only on a periodic basis, the manufacturer may be contacted to determine what periods during a broad time frame of approximately one month or more, access for auditing will be possible. In such circumstances care shall be taken to preserve the unannounced nature of the audit.

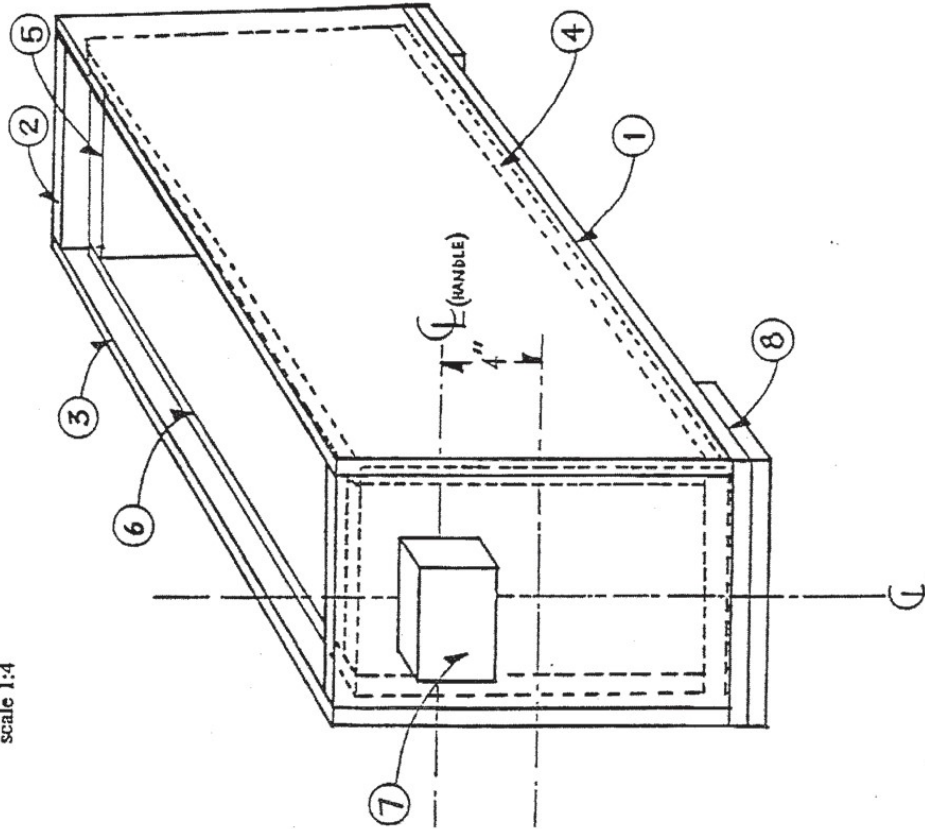
- 4.2.3 To avoid excessive travel costs, the audit will be scheduled with routine inspections in the area, if possible.
- 4.2.4 The auditor shall inspect components as prepared for production, a sample certified unit(s) in production (if in production), and a sample on hand, in stock, or awaiting shipment. (S)he shall carefully review the product codes with the manufacturer's contact person and shall verify the product codes on the audit form for each of the actual components being used. (S)he shall make appropriate notation on the audit form if there is any discrepancy between the components being used and the component codes shown on the form prepared by IGMAC. The auditor shall also check carefully for any non-certified products being manufactured at each location (that is, products that would be coded differently than on the audit form(s) provided for the location) and highlight his/her observations in the comments area of the audit form. The auditor will also include notation in the report of any additional components that may be in stock (eg. sealants) and/or units at the location that may be in production or completed.
- 4.2.5 The auditor shall note on the audit form, the permanent mark and whether the manufacturer is currently using "low E" glass, or is gas filling, in production. Product lines that do not participate in the Gas Component Certification program will be identified on the audit report as AIR irrespective of whether the manufacturer gas fills or not. Only product lines that have successfully met the requirements of the Gas Content Certification program are to be identified on the form as IGMAC certified (designated as GCIA)

Note: The auditor shall advise the manufacturer that, if they are gas filling, they are required to test accordingly for Gas Content Certification by their next regularly scheduled re-certification date. If a manufacturer chooses to make up samples for testing during the current audit, it is permitted to conduct the audit as a facility audit - completing the audit form accordingly.

- 4.2.6 If applicable, the auditor shall verify the construction details related to gas filling, and the gas type used in production, as shown on the audit form and shall note any discrepancy on the form.
- 4.2.7 The auditor shall review the status of the manufacturer's Q.C. records program, recording the status of each record on the audit form.
- 4.2.8 If no certified product in production is available for inspection, the auditor is to be given access to the manufacturer's packaging and shipping areas of the plant so as to inspect general stock of components which has been prepared for both certified and/or non-certified production as the case may be.
- 4.2.9 The auditor shall sign and date the completed audit form and shall have the manufacturer's representative also sign in the place provided and initial the "Permanent Mark" section of the form. The auditor shall leave a copy of the completed audit form with the manufacturer. The Auditor shall return the original copy of the audit form to the serving regional audit office. The Auditor should make an additional copy for his/her records. The serving office will submit the original of the completed audit form to the IGMAC Program Administrator.

Shipping Box
for insulating glass units

scale 1:4



Notes:

In order to maintain a reasonable weight (maximum 90 lb or 41 kg) of the box and contents and to afford maximum protection to the units during shipping the following guidelines have been developed:

1. Use #8 - 2" wood screws (Robertson head) for assembly of the box.
2. The handle (item 7) is centered as shown
3. When soft or sticky sealants are used (e.g. hot melt) apply silicone release paper along inside surfaces of items 2 and 4 (where unit edges will touch)
4. (a) A maximum of 7 - 1/2" sealed double glazing units in one box
(b) A maximum of 5 - 1/4" or 1/2" sealed triple units in one box.
5. Units are packaged resting on their longest edge, side by side and separated by a sheet of 1/16" corrugated cardboard (or equivalent); any excess space should be filled with additional sheets of the packing material.

Item	Qty.	Dimensions	Material
1	2	11 1/2" by 24"	1/4" plywood
2	2	10" by 16"	1/4" plywood
3	2	16" by 24"	1/4" plywood
4	2	10" by 22 1/2"	1" extruded polystyrene
5	2	8" by 14"	1" extruded polystyrene
6	2	14" by 22 1/2"	1" extruded polystyrene
7	2	5" long	2" by 4" spruce
8	2	4" by 11 1/2"	1/4" plywood