IG Certification Manual

North America including Canada

Revised Fall 2009

Edgetech University

www.certifyyourig.com

Theoretical IG Certification Schedule - United States & Canada

Please note that it is suggested to begin the IG Certification process as soon as possible. The below timeline is a best case scenario and is meant for a theoretical overview. Waiting until 2010 is not recommended and will be the last possible chance to gain certification before July 1, 2010 for products requiring NFRC certification and September 1, 2010 for products certified for the Canadian ENERGY STAR® programs.

Note: The dates and time periods represent the least amount of time from start to finish and assume there will be no delays for testing and other factors. Waiting periods are subject to change and are expected to increase due to an influx of certification requests and limited number of testing openings available. More information is available at www.certifyyourig.com.

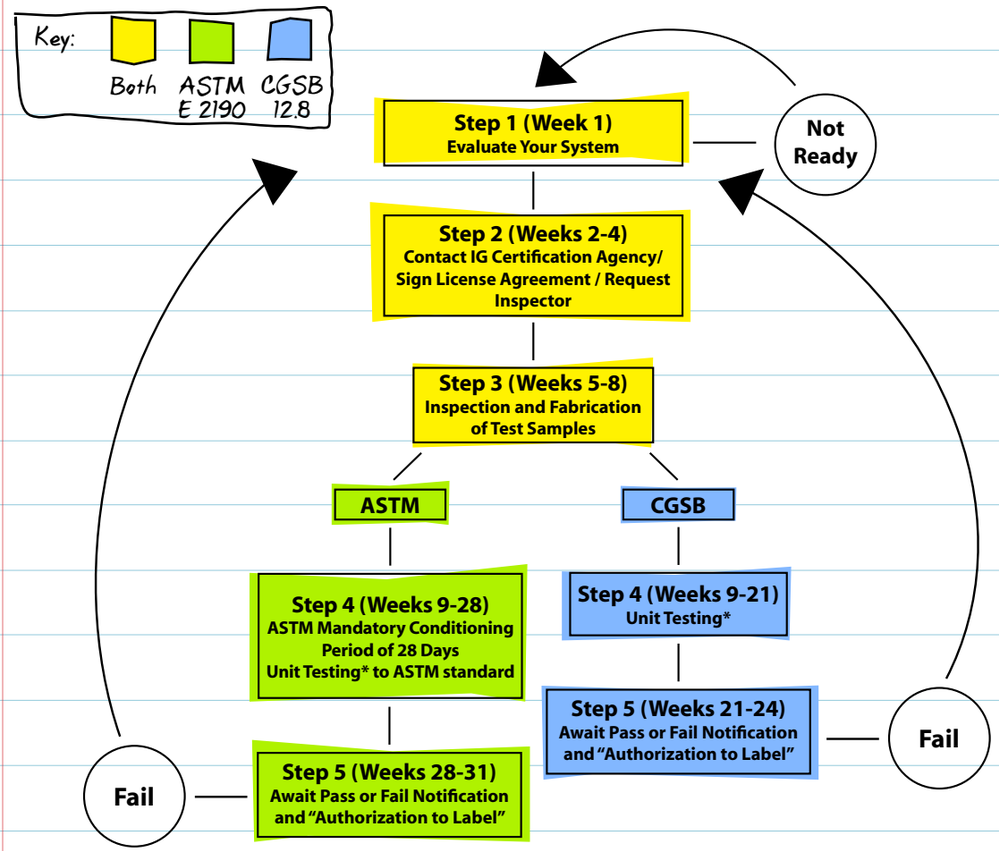
2010 Last Chance Timeline	Standard	Dates
Step 1 Evaluate Your System	CGSB 12.8	Mar 8 - Apr 12
	ASTM E 2190	Oct 4 - Nov 2
Step 2 Contact IG Certification Agency / Sign License Agreement / Request Inspection Audit	CGSB 12.8	Apr 12 - May 10
	ASTM E 2190	Nov 2 - Nov 23
Step 3 Audit Inspection and Fabrication of Test Samples	CGSB 12.8	May 10 - June 7
	ASTM E 2190	Nov 23 - Dec 21
Step 4 Unit Testing ASTM Units are Conditioned for 28 Days After Fabrication	CGSB 12.8	June 7 - Aug 9
	ASTM E 2190	Jan 24 - May 30
Step 5 Await Notification of Pass or Fail Test Results "Authorization to Label"	CGSB 12.8	Aug 9 - Sep 1
	ASTM E 2190	June 1 - July 1

All dates listed assume no delays due to time waits, shipping, unit breakage and other factors.

New program participants are strongly encouraged to allow a minimum of four extra weeks to account for unanticipated waits.

What if you fail testing the first time? It is imperative that manufacturers allow for this possibility and build in enough time to allow for one failed test.

Five steps to IG Certification



*A failure of any unit of the sample set constitutes a failure of the entire set and a completely new test sample set must be made under auditor witness and resubmitted for testing. Also be aware that under the new NRCan and NFRC rules, gas-filled units will be required to also undergo testing. A pass on the gas fill portion means an average of 90% or greater initial gas fill and an average of 80% or greater final gas retention using the same six weathered test samples from Step 4. For the IGMAC program - 10 samples are randomly selected from the test set and tested for initial gas - 90% averaged over the ten samples. Final gas content testing

is on the same ten samples post weathering, HHC (high humidity chamber) and the volatile fog test. Final gas content of 80% averaged over the ten test samples. Test samples that fail the gas fill portion of testing must be submitted for retesting.

If at any stage of the testing the units fail to meet the standard requirements, testing will be discontinued at that point. For initial gas failures, manufacturers may elect to continue with conventional testing; however, to obtain gas certification new samples must be submitted for full testing. Product lines that meet the final gas-fill percentage requirements but fail the initial are encouraged to contact their certifying agency for their programs specific requirements.

National Fenestration Ratings Council (NFRC) and Department of Energy (DOE) to put new ENERGY STAR® mandates into effect by July 1, 2010.

Based on the recommendation of the Insulating Glass Industry Durability Advisory Group (IGIDAG), the U.S. Department of Energy agreed to require insulating glass certification as a prerequisite for ENERGY STAR® labeling. Because NFRC rating, certification and labeling is required of ENERGY STAR® labeled fenestration products, this became a proposed mandatory requirement for NFRC certification.

This new requirement is expected to go into effect by July 1, 2010.
This manual was designed to ensure you can continue using the ENERGY STAR® label when the mandate goes into effect.

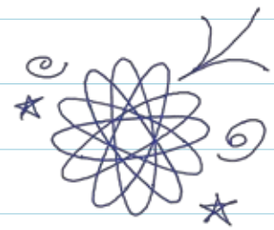
IG Certification Manual

Natural Resources Canada (NRCan) will be mandating IG Certification for the Canadian ENERGY STAR® program. The implementation date will be September 1, 2010.

In Canada, IGMAC (Insulating Glass Manufacturers Association of Canada) Certification has been a requirement in the CSA A440.2 standard for many years. Additionally, the three agencies that offer thermal performance certification require IG Certification as part of their program requirements. It is not expected that there will be major delays in testing for participants who will certify under the Canadian requirements other than delays for conditioning, shipping, glass breakage and other failures.

Inside this manual you will find:

- A general timeline for certification
- Five simple steps to IG Certification
- Frequently asked questions
- A glossary of related terms
- A comprehensive directory of IG Certification Agencies



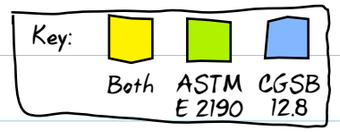
IG Certification Timing is Everything

www.certifyyourig.com

Five Steps to IG Certification

For those manufacturers currently participating in the NFRC Certification Program and who do not currently certify IG, preparing now is key. There are a limited number of labs in North America with each having a fixed number of test specimens that can be tested per 15 week period. As the new mandate draws nearer, extended lead-times and testing backlogs are a major concern.

The entire IG Certification process currently takes approximately 31 weeks* for the ASTM E 2190 standard, and 24 weeks* for the CGSB 12.8 standard, so acting fast is critical to meet the 2010 July 1st or September 1st deadlines. Canadian IG fabricators must be certified by July 1, 2010 if they require compliance to NFRC:



Week 1: Evaluate your system

Weeks 2-4: Contact IG Certification Agency/Sign License Agreement/Request Inspector

Weeks 5-8: Inspection and Fabrication of Test Specimens

Weeks 8 -12: Conditioning of ASTM E 2190 units

Weeks 9-21: Unit testing to CGSB 12.8 standard

Weeks 12-28: Unit testing to ASTM E 2190

Weeks 21-24: CGSB 12.8 program: Await pass or fail notification and authorization to label

Weeks 28-31: ASTM E 2190 program: Await pass or fail notification and authorization to label

*TIMELINE IS SUBJECT TO CHANGE AS LABS BECOME FULL.

STEP 1: EVALUATE YOUR SYSTEM

This may be done by referencing a certified products directory provided by IG Certification agencies to see if a system comparable to yours has passed. These directories can be found online at each IG Certification Agency Web site. Please note that many of these certified products passed under old standards (E774), which are less strict than ASTM E 2190.

- Log onto the Web site of one or more of the certification programs and access the Certified Products Directory (CPD).
- Search the CPD by spacer and sealant type that you are currently using and/or have interest.
- If the spacer/sealant system is found, check to determine if testing was to ASTM E774, ASTM E2190 or CGSB 12.8.
- If testing is to ASTM E774 then this is obsolete and will not meet the requirements of the NFRC.

You will also need to determine if your quality assurance program will meet the QC requirements of the IG certification program by conducting a "GAP" analysis.

STEP 2: CONTACT AN IG CERTIFICATION AGENCY

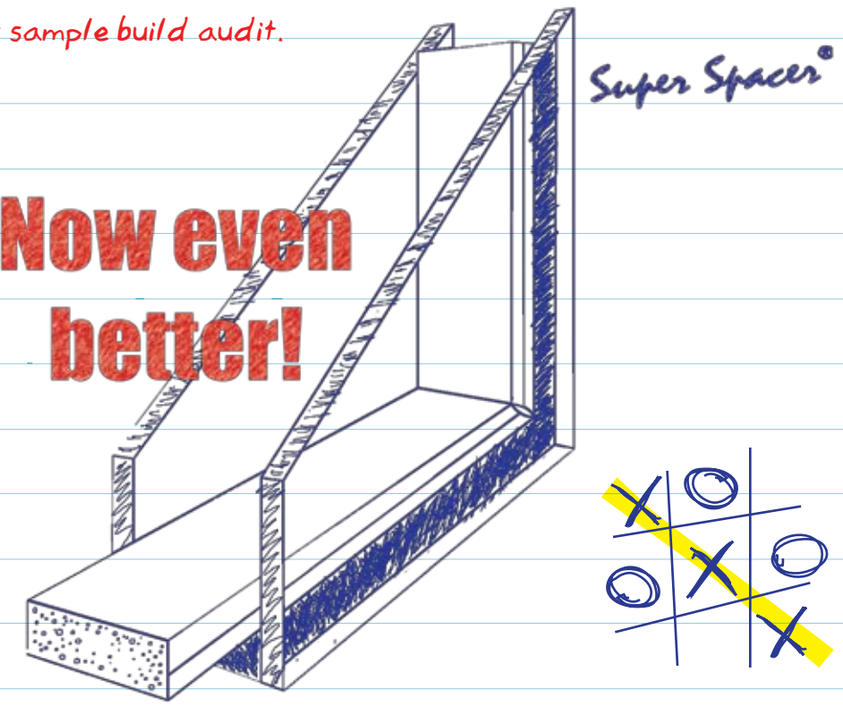
Upon request to begin the certification process, the agency will provide specific instructions on how to get started, which usually includes completing paperwork, scheduling test time with an approved independent testing laboratory and paying all associated fees. After paperwork is complete, the agency will issue an audit report to an authorized inspector. A second key component of the auditor's inspection is the review of your Quality Assurance program and supporting documentation. A formal QA program is a mandatory requirement of all IG Certification programs and you should review the details of this mandate prior to the auditor's visit.

- Log onto the Web site of the IG certification program with which you intend to list and download information concerning program procedures and licensee requirements. To be in accordance with NFRC requirements, any accepted certification agency must be compliant to ISO Guide 65 and use independent testing laboratories that are accredited to ISO 17025 to perform ASTM E2190 or CAN/CGSB 12.8 (Canada).

Five Steps to IG Certification

(Step 2 continued)

- Evaluate the Quality Assurance Program requirements of the chosen agency and ensure that you meet the minimum.
- Contact agency to submit paperwork and schedule an initial audit and test sample build date.
- Note any limitations of the certification program regarding presence of component suppliers at time of IG unit build. Some do not allow for component suppliers to be present during the test sample build audit.



STEP 3: INSPECTION AND FABRICATION OF TEST SPECIMENS

It can take up to a month for the auditor to come to your plant and the auditor must be present to witness the manufacturing of sample units. After manufacture is complete, the test units will be labeled by the auditor. Under ASTM E 2190, the units must ship to the lab within 4 weeks of IG fabrication. Under the IGMAC program, test units must be received by the lab no later than 90 days after fabrication. Units received 91+ days are rejected and the fabricator must have a new facility audit. They may condition at either the fabricator or the testing laboratory. This allows for stabilization of the test units before testing. This requirement is detailed in ASTM E 2188, Standard Test Method for Insulating Glass Performance, Item 7.2, which is the referenced test method in ASTM E 2190.

- Ship test samples to an independent laboratory that is approved by the chosen certification agency and meets the above mentioned accreditation requirements. These units must be marked/labeled by the auditor for identification prior to shipment to the testing facility, and a copy of the completed inspection report must accompany the test samples.

STEP 4: SUBMIT UNITS FOR TESTING

After manufacture is complete, the test units will be labeled by the auditor, shipped to the test lab (within 4 weeks for ASTM E 2190, within 90 days for IGMAC) and conditioned. During this time,

the test units will undergo the prescribed tests, which include high humidity, accelerated weathering and volatile fog tests.

- A failure of any unit of the sample set constitutes a failure of the entire set and a complete new test sample set must be made under auditor witness and resubmitted for testing.

STEP 5: AUTHORIZATION TO MARK

Upon successful completion of the testing and submittal of the test reports, the Certification Agency will send you a notification of certification and authorize you to mark your IG with certification identification.

- Upon successful completion of testing and with your approval, the laboratory will forward the test report to the IG certification program agency that you have chosen.

- Upon confirmation of all necessary documents, verification of an acceptable Quality Assurance program and review of laboratory test report, the certification agency will provide a formal notification that allows you to "mark" (e.g., label, watermark, engrave, etch, etc.,) IG units demonstrating listing under the certification program's Certified Products Directory.

Five Steps to IG Certification

For IG units requiring compliance to NFRC, the NFRC Inspection Agent (IA) will review documentation that you provide at the next NFRC inspection. This is to ensure IG units being manufactured for use in NFRC certified and labeled fenestration products are compliant with NFRC and DOE/ENERGY STAR® requirements.

In Canada (for units not requiring compliance to NFRC), this verification is conducted by one of the three agencies (selected by the window manufacturer) that offer thermal performance programs and testing. These agencies are the Canadian Standards Association, Intertek Testing Services and the Quality Auditing Institute.

Frequently Asked Questions

What is ASTM E 2190?

ASTM E 2190 was approved in 2002 as part of a continuing effort to harmonize North American standards for IG testing and performance. E 2190 is a standard specification for IG unit performance and evaluation designed to be equal to or improved over its predecessors ASTM E 774 (U.S.) and CGSB 12.8 (Canada).

DUAL-SEAL RULES

Frequently Asked Questions

ASTM E 2190 testing is divided into three parts:

- High Humidity Test IG - samples are subjected to two periods of continuous high-humidity and high-temperature (95% RH at 140°F) exposure. The first period is for 28 days prior to Accelerated Weathering testing and the second is for 14 days following weathering.

- Accelerated Weathering Testing - simulates weather cycling from -20° F to 140°F with high humidity and UV radiation exposure over a 63-day period. Six of the submitted test samples undergo both the high-humidity test cycles and accelerated weathering.

- Volatile Fog Test - uses UV radiation and elevated temperatures to show whether IG units contain volatile components that may condense inside the IG unit as a visible "fog". Two test samples are selected for this test.

What is CGSB 12.8?

The CGSB 12.8 Standard has been the Canadian standard for more than 20 years. The CGSB 12.8 standard is divided into four parts:

- High Humidity Test IG - Seven test samples are subjected to a constant water mist, with temperature cycling from a minimum temperature of 22 F +/- 3 C to a maximum of 55 F +/- 3C for 28 days.

- Accelerated Weathering Testing - simulates weather cycling from -32 F +/- 3C to 50 F +/- 3C for 53.3 days. Four test samples are subjected to this test.

- Volatile Fog Test - uses UV radiation and elevated temperatures to show whether IG units contain volatile components that may condense inside the IG unit as a visible fog. The Canadian fog test has a greater maximum temperature of 10 degrees Celsius over the ASTM E 2190 test. Two test samples are selected for this test.

- Initial Gas Fill - Ten samples are selected at random from the submitted test set. Of these units, four units are tested for high humidity and four units for accelerated weathering. The two units selected for the volatile fog test are also tested for initial gas fill for a total of 10 units. The CGSB standard also mandates final gas fill measurements, but a final gas fill percentage was not established in the standard. The ten units that are selected for gas fill measurement must meet 90% or greater, an average figured using the ten test samples to pass the initial gas fill requirement. However, the IGMAC program has both initial and final gas content requirements.

Frequently Asked Questions

Will my single seal system pass ASTM E 2190?

Because of the stringent nature of E 2190 test methods, some units - particularly those with only a single-seal construction - may have difficulty passing the test requirements and some re-engineering may be required.

What are the standard sample sizes for IG Certification?

For both the ASTM and the CGSB standard, test samples are 14 x 20 inches; 4mm (5/32-in.) glass with 12mm (1/2-in.) airspace. For the ASTM standard two additional glass thicknesses are allowed: 5mm (3/16-in.) glass with 6mm (1/4-in.) airspace or 6 mm (1/4-in) glass with 12 mm (1/2-in) airspace. Testing IG unit specimens fabricated with 6 mm (1/4-in) glass with 12mm (1/2-in.) airspace is considered a more stringent test.

Frequently Asked Questions

How many test units are required for IG Certification?

ASTM E 2190 - For double-glazed units:

Twelve units are required and are dispersed as follows:

- Six units for the High Humidity and Accelerated Weathering
- Two units for the Volatile Fog Box
- Two units to allow for breakage during shipping
- Two units to allow for breakage during testing

ASTM E 2190 - For triple-glazed units:

Fourteen units are required and are dispersed the same as double-glazed, with the extra two units going into the Volatile Fog Box.

CGSB 12.8 - For double-glazed or triple-glazed units:

A maximum of 24 units can be fabricated at the time of the audit. The actual testing requires:

- Eight units for High Humidity
- Four units for Accelerated Weathering
- Two units for the Volatile Fog Box
- Two units to allow for breakage during testing
- Units 17-24 allow for breakage during shipping

What if my system does not pass ASTM E 2190 or CGSB 12.8?

Manufacturers should give themselves plenty of time before the mandate goes into effect and anticipate additional costs to redesign or purchase the new IG fabrication equipment necessary for them to be compliant.

Who should I contact to begin the IG Certification process?

Upon evaluating your system, contact an IG Certification Agency (see IG Certification Agency Directory).

Glossary of Related Terms

Accelerated Aging: Laboratory conditions designed to recreate the normal aging process of IG units in a short period of time.

ASTM E 2188: North American harmonized ASTM standard test method for IG unit durability performance.

ASTM E 2189: North American harmonized ASTM standard test method for testing IG unit resistance to volatile fogging.

ASTM E 2190: North American harmonized ASTM standard specification for IG unit performance and evaluation.

ASTM E 773, E 774, E 1887: Previous U.S. standards for IG unit testing, performance and evaluation (replaced by harmonized E 2188, E 2189, E 2190).

CGSB 12.8: Canadian standard specification for IG unit testing, performance and evaluation. This standard was one of the predecessor standards in developing the ASTM E 2188, E 2189 and E 2190 standards; however, CGSB 12.8 remains an active standard in Canada and is the reference standard for IG certification under the IGMAC certification program. Both ASTM E 2190 and CGSB 12.8 are referenced in the National Building Code of Canada.

Condensation: Formation of moisture on an IG unit surface when the surface temperature is lower than the localized air dew point. Condensation occurs first around the window's edge, where surface temperatures are the coldest. If a standard cold edge spacer exists and outside temperatures fall to 0°F/-17.78°C, condensation will form on the glass edge even in homes with as little as 15% relative humidity.

Dual Seal Units: Insulating glass using two separate sealants for the edge seal system. Based on material characteristics, one sealant is used principally for the resistance of moisture into the IG unit and to prevent leakage of insulating gases (argon, krypton). The second sealant primarily acts as a structural sealant/adhesive to maintain the integrity of the IG unit.

Frost Point: Temperature within an IG unit at which moisture condenses and/or freezes on the interior glazing surface(s). To pass the requirements of ASTM E 2190, an IG unit must have a frost point equal to or less than -40°F or -40°C . Dry ice with thermocouples and digital indicators are used to determine the frost point in an IG unit.

P-1 Test: IG units are tested and evaluated under extreme temperatures, humidity and ultraviolet (UV) light exposure. Test specimens are fully and continuously exposed to conditions of 140°F or 60°C, 95% RH and 100% UV. Many engineers consider

Glossary of Related Terms

P-1 the world's toughest accelerated aging and durability test. One week of testing is considered by industry experts to be equivalent to approximately one year in the field.

R-Value: A measure of the resistance to heat loss; a measure of conductivity. R-value is the inverse of U-value.

Single Seal Units: Insulating glass using a single sealant for the edge seal system. Based on material characteristics, the single sealant is used for the resistance of moisture into the IG unit to prevent the leakage of insulating gases (argon, krypton) out of the unit and as a structural sealant/adhesive to maintain the integrity of the IG unit.

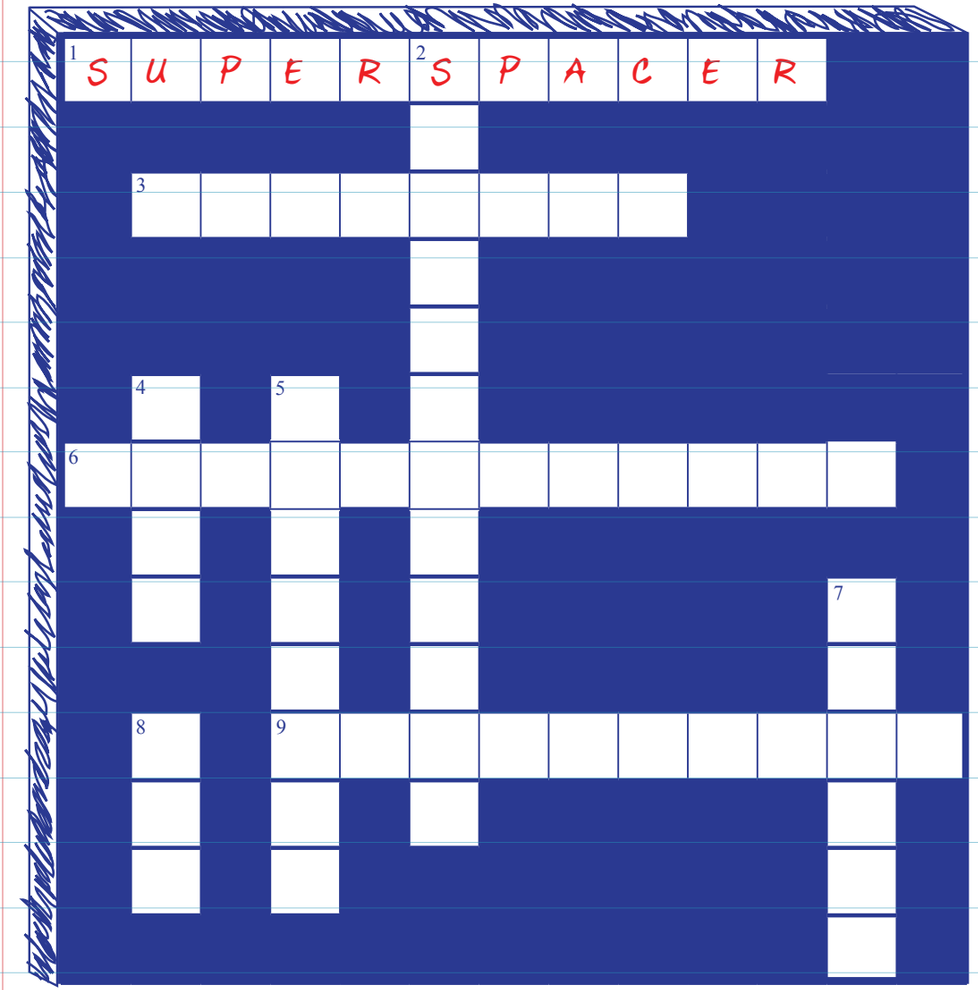
Spark Emission Spectrograph: Equipment used to measure argon gas concentration in an IG unit through non-destructive emission of an electrical spark within the IG unit.

U-Value or U-Factor: A measure of how well heat is transferred by the entire window - the frame, sash and glass - either into or out of the building. U-value is the inverse of R-value.

Volatile Fog: Condensation of chemicals or other impurities within an IG unit on the interior glazing surface(s) that result in a permanent haze or "fog".

Edgetech IG has figured out the IG certification puzzle. Just in case you were still hoping for a challenge, we made a fun and helpful puzzle for you to solve below. (answers are at back of manual)

Assignment 1



Across

1. ~~Super~~ _____
3. Better than single seal
6. Formation of moisture on an IG
9. Label for IG certified windows

Down

2. Sustainable window technology
4. Super Spacer® is made from this
5. Industry experts
7. Measurement rate of heat loss
8. Edgetech's value promise

31 weeks? Can you afford to not be dual seal? Find the key benefits to help ensure you pass IG Certification requirements.

Assignment 2

E	N	E	R	G	Y	S	T	A	R	V	I
L	D	G	S	U	M	N	B	Z	V	P	J
S	B	U	W	L	F	B	M	K	S	R	D
U	B	S	A	E	T	S	E	F	A	Y	U
S	U	G	T	L	A	N	A	R	I	P	R
T	V	X	V	T	S	M	H	G	Y	L	A
A	V	E	U	L	S	E	E	A	I	R	B
I	G	O	T	P	A	B	A	G	J	A	I
N	Y	R	A	K	E	A	L	L	D	K	L
A	D	C	E	U	D	C	T	A	L	W	I
V	E	T	P	N	G	E	H	Z	C	B	T
I	A	H	O	A	E	F	S	J	B	X	Y
E	B	X	R	X	T	R	M	X	V	G	V
W	D	K	B	N	E	D	A	W	F	Z	X
G	O	Y	L	U	C	I	R	I	N	N	W
O	C	I	L	G	H	L	T	P	S	J	M
S	U	F	O	A	M	W	R	R	L	T	Z
U	G	B	G	H	H	S	J	N	A	G	C
S	U	P	E	R	S	P	A	C	E	R	I
I	D	D	S	F	J	L	J	H	P	D	S

~~Edgetech~~ Dual Seal

SustainaView ENERGY STAR®

Health Smart Durability

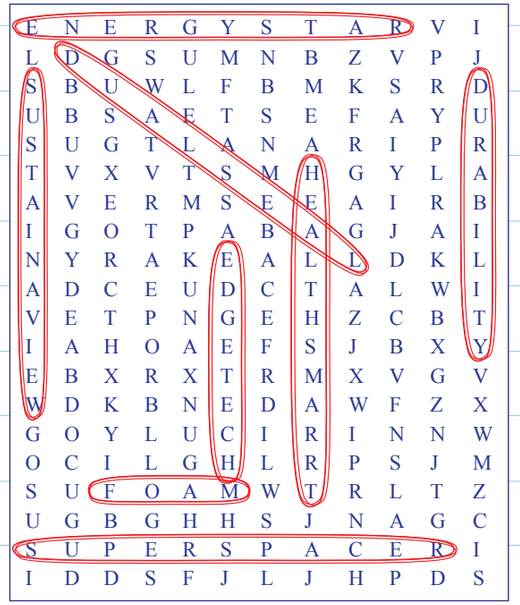
Super Spacer Foam

Notes

Assignment 1 - ANSWER KEY

1. Super Spacer 2. SustainaView 3. Dual Seal 4. Foam 5. Edgetech 6. Condensation
7. U-Value 8. 360 9. Energy Star®

Assignment 2
ANSWER KEY



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Start Certification Now!

IG Certification Agency Directory

www.certifyyourig.com

Insulating Glass Certification Council (IGCC)

100 West Main Street
PO BOX 730
Sackets Harbor, NY 13685

Web: www.IGCC.org
Phone: (315) 646-2234
Fax: (315) 646-2297

IGCC-IGMA Certification Program for ASTM E2190 and Gas Content

Insulating Glass Manufacturers Alliance (IGMA)

1500 Bank Street, Suite 300
Ottawa, ON
K1H 1B8

Web: www.igmaonline.org
Phone: (613) 233-1510
Fax: (613) 482-9436

IGMAC Certification Program for CGSB 12.8 and Gas Content

Keystone Certifications

1790 Old Trail Road
Etters, PA 17319

Web: www.keystonecerts.com
Phone: (717) 932-8500
Fax: (717) 932-8501

ASTM Certification Program

National Accreditation and Management Institute (NAMI)

11870 Merchants Walk
Suite 202
Newport News, VA 23606

Web: www.namicertification.com
Phone: (757) 594-8658
Fax: (757) 594-8659

ASTM Certification Program

Associated Laboratories

1323 Wall St.
Dallas, TX 7521

Phone: (214) 565-0593
Fax: (214) 565-1094

ASTM Certification Program

RECYCLED CONTENT