



# RSL Energy Efficiency Program



*Energy efficiency and beauty at your doorway!*



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## RSL Green Commitment

RSL and Champion Injection Molding are committed to conducting business in a manner that demonstrates environmental responsibility and provides our customers with environmentally beneficial products. Utilizing energy efficient strategies of lean manufacturing, waste minimization, product durability, recycling, geographic sourcing and fuel conservation, the program focuses on continuous improvement. The program has already successfully eliminated waste in the production process, logistics stream and office protocols.

### Lean & Green

A recent investment at the Warren Ohio production facility in low energy tri-phosphorous Ecovations™ lighting, will lower energy consumption by 65,000 kWh per year and create a safer workplace with increased visibility. The implementation of shutdown electronics, equipment and lights when not in use has proven to be a great common sense way to lower energy usage.

Taking steps toward environmentally responsible logistics, RSL/CIM have joined with the EPA in the SmartWay™ partnership. This program aims to reduce greenhouse gas emissions by committing to lower company carbon footprint. The carbon footprint is the total set of “greenhouse gasses” created by a company or process. Utilizing SmartWay™ certified carriers can reduce these emissions. The EPA has approved SmartWay™ carriers as environmentally cleaner and more fuel-efficient options for the transport of goods.

RSL/CIM also use electronic media whenever possible for corporate communication and are continually looking for ways to reduce waste, reuse material and recycle. The companies take pride in working closely with suppliers and customers on finding innovative ways how to lower waste and promote a cleaner environment.

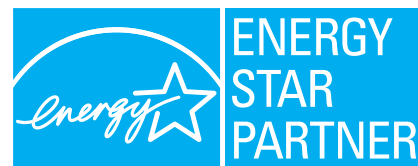
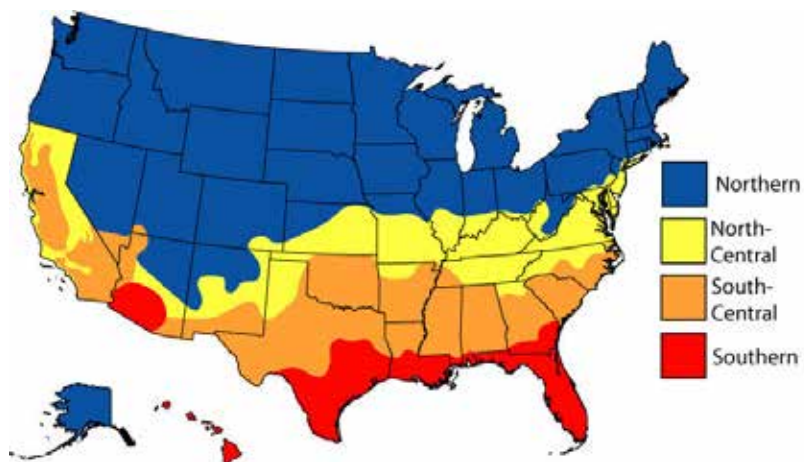
RSL and Champion keep the environment as well as their customers in mind when designing packaging. Both companies use cardboard that is made from 100% recycled medium and biodegradable inks. This provides an environmentally responsible and product friendly way to package goods.





## Energy Star

An energy efficient home does not have to compromise privacy, natural light or beauty at your doorway! RSL doorglass can be used in doors to meet ENERGY STAR and Green Building criteria. RSL includes its U factor and SHGC rating on each label adhered to our doorglass products. The ENERGY STAR Windows Program is a voluntary partnership between the EPA (Environmental Protection Agency) and the NFRC (National Fenestration Rating Council) to promote sales of energy efficient windows and doors. Regional thermal performance standards are defined across four climate zones. Local and state codes may be more or less stringent.



ENERGY STAR APPROVAL FOR YOUR ENTRY DOOR

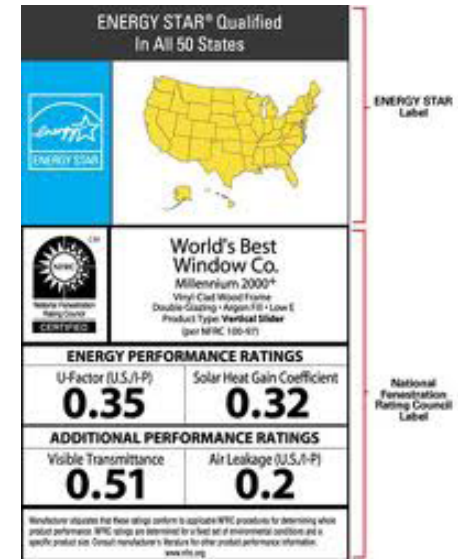




# Certification - National Fenestration Rating Council (NFRC) and Energy Star

The National Fenestration Rating Council (NFRC) certifies U-Factor and Solar Heat Gain Coefficient performance for door assemblies.

Energy Star's program for doors is managed by the Environmental Protection Agency (EPA) in order to spur production of NFRC qualified products designed to reduce energy use and associated costs for homeowners.



## Why is NFRC Certification needed?

- Required for ENERGY STAR label
- Required to back up manufacturer's certification statement per the IRS
- Specified in ENERGY STAR homes and green building programs
- Opportunity for competitive advantage
- To be prepared for more stringent codes in future
- Assists in qualifying for Energy Saving Tax Credits



# 1 — Certification

- \* Specify products you want to qualify for Energy Star.
- \* RSL [www.RSLinc.com](http://www.RSLinc.com) and your door slab supplier can help guide you through the process.
- \* RSL is performing simulations of our products in several popular doors to save you time and expense.

*Note: The NFRC website also has information on the certification process.*

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# 2 — Contact NFRC

- \* Contact the NFRC at [www.nfrc.org](http://www.nfrc.org). Call Toni Stroud at 240 821-9511 or 301 589-1776 and/or [tstroud@nfrc.org](mailto:tstroud@nfrc.org)
  - \* He will send the Pre-Hanger a packet of forms. Sign a license agreement with the NFRC.
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# 3 — Contact Inspection Agency

- \* RSL recommends NAMI at 804 684-5124 but other options are Keystone, and AMMA.
  - \* Complete a rough draft of the Quality Assurance Manual to the IA within 30 days of registering with NFRC. The IA will offer guidance if needed.
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# 4 — Select Simulation Labs

- \* Select a SIMULATION lab and a VALIDATION lab.
- \* Architectural Labs 717 764-7700 is a recommended SIMULATION and VALIDATION test lab. RSL can provide data to other labs if they sign a confidentiality agreement.

*Note: Physical testing may not be needed if already completed by the door slab mfg. for their own original NFRC certification.*





## 5 — Computer Simulation

- ✿ Request RSL and door slab supplier(s) to provide product design data to Architectural Testing for computer simulations.
- ✿ Simulator calculates U-factor and SHGC.
- ✿ RSL is performing simulations for a defined set of doors to save you money and time.
- ✿ This report is called the Simulation Matrix with Ratings
- ✿ Timing: 12 weeks (may vary)
- ✿ Cost: \$500 - \$3,000 depending on the number of door and doorglass combinations.

*Note: Do not simulate models you will not label.*

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## 6 — Physical Validation Test

- ✿ ONE door and doorglass combination from the simulation study needs to be physically tested by the test lab (Architectural Testing).
- ✿ Your company must prepare and send a prehung test specimen to the test lab.  
*Note: Consult with your IA to determine if previous physical tests can be used.  
Using a previous physical test will save time and expense.*
- ✿ The physical Validation Test needs to correlate with the simulation (Simulation Matrix with Ratings).
- ✿ Cost: \$600 to \$1,500, if needed.





## 7 — Simulation Report

- \* Simulation Lab writes Simulation Report that includes:
  - \* Simulated reference values (Simulation Matrix with Ratings).
  - \* Validation Test values
  - \* Description of the glass thickness, glass coating, type of spacer, air gap, air filler, glazing layers, type of door, etc.
  - \* Report is released to an Inspection Agency (IA) through the permission of RSL.
  - \* IA double checks simulation report and issues “Validation Review of Simulation Test & Physical Test”
  - \* IA approves Simulation Report and assigns your company Certification Authorization Report (CAR#).
  - \* Results uploaded to NFRC database.
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## 8 — Inspection and Labeling

- \* Pre-Hanger develops an annual inspection and labeling procedure with IA.
  - \* Schedule an inspection within the first six months of licensing..
  - \* IA fees: \$1400 to \$2100 a year.
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## 9 — Energy Star

- \* Email [partnership@energystar.gov](mailto:partnership@energystar.gov) to request a door category.
- \* Request direct access to Energy Star artwork files.
- \* Learn more at [www.energystar.gov](http://www.energystar.gov).







## Green Building Practices

Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and human health. But effective green buildings are more than just a random collection of environmental friendly technologies. They require careful, systemic attention to the full life cycle impacts of the resources embodied in the building and to the resource consumption and pollution emissions over the building's complete life cycle.

On the aesthetic side of green architecture or sustainable design is the philosophy of designing a building that is in harmony with the natural features and resources surrounding the site. There are several key steps in designing sustainable buildings: specify 'green' building materials from local sources, reduce loads, optimize systems and generate on-site renewable energy.

Building materials typically considered to be 'green' include rapidly renewable plant materials like bamboo and straw, lumber from forests certified to be sustainably managed, dimension stone, recycled stone, recycled metal, and other products that are non-toxic, reusable, renewable, and/or recyclable. Building materials should be extracted and manufactured locally to the building site to minimize the energy embedded in their transportation.

Low-impact building materials are used wherever feasible. However, a common fallacy is that 'green' materials are always better for health of occupants or the environment. Many harmful substances (including formaldehyde, arsenic and asbestos) are naturally occurring and are not without their histories of use with the best of intentions. A study of emissions from materials by the State of California has shown that there are some green materials that have substantial emissions whereas some more 'traditional materials actually were lower emitters. Thus, the subject of emissions must be carefully investigated before concluding that the natural materials are always the healthiest alternatives for occupants and for the earth.

\* Contact RSL or your local distributor for a signed copy of our Manufacturer's Certification Statement for energy efficiency tax credits.



## RSL Testing

On July 1st 2010 a new NFRC (National Fenestration Rating Council) requirement for IGUs (Insulated Glass Units) goes into effect regarding performance rating and labeling. This is a federally mandated requirement for Energy Star qualification. As a component manufacturer, no doorglass product can be Energy Star certified alone. RSL, however, has conducted and passed the testing required by NFRC. RSL has selected NAMI (National Accreditation and Management Institute), an NFRC authorized company, as its certification agency for this program. Performance testing will be conducted every two years and an audit of RSL's fabrication process will be done twice annually. RSL will identify approved IGU with NAMI logo and approval # etched in the bottom right corner of each IGU. Architectural Testing for **ASTM E2190** conducted successful seal durability testing (fogging, humidity & accelerated weathering) of RSL sealed insulating glass units and summarized the results in ATI report #89495.01-122-28. NAMI certified these test results (report #NI1009973).

Architectural Testing conducted **Acoustical Performance** testing (report #83632.01-113-11). This test measured sound transmission loss.

Architectural Testing conducted thermal performance simulations of RSL Clear, LowE, GBG, BBG, Impact and decorative doorglass in accordance with NFRC standards for **U Factor**, **Solar Heat Gain Coefficient**, and Visible Transmittance. The tests included a wide range of doorglass sizes with various spacer widths, materials, insulating techniques, gas filling, clear tempered and LowE glass. The test were conducted using both polystyrene and polyurethane filled steel and fiberglass doors.





## RSL Testing

RSL doorglass frames protect against moisture and air infiltration in two ways (frame to glass and frame to door). RSL vinyl and Impact frames both have co-extruded flaps on both frame to glass and frame to door edges. These white, watertight flaps eliminate oozing and provide an excellent seal. RSL's injection molded frames use a frame to door **sealant** that is a white, foamed material combining the best qualities of closed cell foam and elastomer (rubbery) sealants. This high adhesion sealant has moderate surface tack with superior heat resistance (2830F). The frame to glass sealant uses a mildew resistant, solid butyl that will not shrink, crack or become brittle.

RSL's **Hurricane Impact** units are engineered to meet high velocity hurricane zone requirements TAS 201, 202 & 203. Tested at Testing Evaluation Laboratories and approved by Florida Building Code #FL11515, this product withstood 9000 pressure cycles against water & air infiltration and has a DP of +/- 60psf.

RSL Clear, **LowE**, and GBG doorglass is insulated with aluminum spacer bars, whose horizontal lengths are filled with moisture absorbing desiccant. To ensure accurate identification of the time and location of manufacture, the vertical aluminum spacer bars are etched with "RSL" and the month and year of assembly.

RSL uses soft coat and hard LowE glass in order to reduce air conditioning energy in the summer and reduce heating in the winter. This energy efficient glass is insulated on the #2 side (sealed in the airspace on the outer pane of tempered glass and facing the inside of the home).



A wide selection of RSL products meet energy efficient requirements.



## Test Standards

**Rigorous requirements ensure durable IGU performance.**

- ◆ **ASTM E2188 – 2002**  
Standard test method for IGU weather & humidity cyclic testing
- ◆ **ASTM E2189 - 2002**  
Standard test method for IGU resistance to fogging
- ◆ **ASTM E2190 - 2008**  
Standard test method for IGU performance. Six samples tested for 105 days in humidity and weather cycling tests with initial, intermediate and final frost / dew point requirements at minimum to -40°C. Two samples tested for 7 days to resistance to fogging with no fogging as pass criteria
- ◆ **ASTM E413-04**  
Standard test method for rating sound insulation
- ◆ **NFRC 100-2004**  
Procedure for determining U-Factors
- ◆ **NFRC 200-2004**  
Procedure for determining Solar Heat Gain Coefficient & Visible Transmittance





# Energy Efficiency Ratings in Fiberglass Doors

- Half light doorglass must be equal to or less than .25/.25 for U factor & SHGC
- Doorglass larger than half lights must be .30/.40 in North or North Central regions
- Doorglass larger than half lights must be .30/.25 in South or South Central regions

		1/2" Clear	1/2" Std Low-E	1/2" Clear GBG	1/2" Std Low-E GBG	1" Clear	1" Std Low-E	1" Std Low-E GBG	BBG Clear (Closed)	BBG Std Low-E (Closed)	1" Decorative	Impact Clear	Impact Std Low-E	Impact Std Low-E GBG	Impact Decorative
<b>Half Light</b> 36" & 3/4 Oval	U-Factor	.28	.25	.29	.25	.27	.23	.23	.24	.21	.23	.25	.22	.22	.22
	SHGC	.20	.17	.17	.15	.20	.17	.15	.06	.03	.16	.17	.16	.14	.13
	DT/VT	.21	.19	.18	.16	.21	.19	.16	—	—	.17	.20	.18	.16	.15
	ST	28	28	28	28	32	32	32	35	35	32	35	35	35	35
<b>3/4 Light</b> 48" & Large Oval	U-Factor	.30	.27	.31	.26	.28	.24	.24	.26	.22	.24	.27	.24	.24	.24
	SHGC	.24	.21	.21	.18	.24	.21	.18	.07	.04	.19	.21	.19	.17	.16
	DT/VT	.25	.23	.22	.20	.25	.23	.20	—	—	.20	.24	.22	.19	.19
	ST	28	28	28	28	—	—	—	35	35	32	35	35	35	35
<b>Full Light</b> 64" & 80"	U-Factor	.36	.32	.37	.31	.34	.28	.28	.30	.26	.28	.31	.26	.26	.27
	SHGC	.31	.27	.27	.23	.31	.26	.23	.09	.05	.24	.27	.25	.22	.20
	DT/VT	.33	.30	.28	.26	.33	.30	.26	—	—	.26	.32	.29	.25	.25
	ST	28	28	28	28	30	30	30	35	35	32	35	35	35	35

**U-Factor:** Defines the amount of heat loss. The lower the value, the less heat is transmitted through the entry door.

**Solar Heat Gain Coefficient (SHGC):** The portion of directly transmitted and absorbed solar energy that enters the interior. The lower the value, the less heat is transmitted through the entry.

**Daylight Transmission/Visible Transmission (DT/VT):** Measures how much light comes through the entry. The higher the value, from 0 to 1, the more daylight is let in over the unit area of the entry.

**Sound Transmission (ST):** Measures how much sound comes through the entry. The higher the value, the more sound transmission is reduced.

The performance ratings above were developed by Architectural Testing using applicable NFRC procedures for determining whole product performance. The ratings are determined for a fixed set of conditions and specs.

