

## **Product Performance Approval Q & A...**

January 30, 2007

### **1. What is the International Residential Code (IRC) and the International Energy Conservation Code (IECC)?**

The International Residential Code (IRC) is a comprehensive, stand-alone residential code that creates minimum regulations for one and two-family dwellings of three stories or less. It brings together all building, plumbing, mechanical, fuel gas, energy and electrical provisions for one and two-family residences. The IRC also provides a prescriptive approach (i.e., a set of measures) and a performance approach (i.e., energy modeling) for determining compliance. For our products, this IRC code sets guidelines on Safety Glazing and minimum requirements for energy performance.

The International Energy Conservation Code (IECC) is a code that encourages energy conservation through efficiency in building envelope design, mechanical systems, lighting systems and the use of new materials and techniques. For our products, the IECC sets guidelines on energy performance. The IECC is similar to the energy related components of the IRC, and is referenced within the IRC, though the two are not always identical. Each state has its own energy code requirements. State energy codes are often based on a version of the IECC. State of Texas regulations require houses with "fenestration" amounts (windows and doors) greater than 15% of the total envelope area (all exterior including walls and roof) to achieve the IECC guidelines, and not the IRC energy guidelines.

**2. How do these codes differ from the Federal CPSC Consumer Product Safety Commission guidelines?** The Consumer Product Safety Commission established safety glazing guidelines back in the 1970's which placed requirements on the use of safety glass in and around exterior doors. The IRC code, as it pertains to safety glass used in residential installations, is very similar to the CPSC code. Both of these codes allow for the exemption of certain types of decorative glass from the safety glass requirement. Regardless of the specifics of these two codes, all "outboard" glass used in GlassCraft doors, sidelites, and transoms incorporate safety glass. (Outboard panes refers to the exterior glass panels used in an insulated glass panel), and these products all meet or exceed the safety glass requirements.

### **3. What are the Performance Measurements....U Value, R Value, SHGC and DP Ratings?**

The *R-value* is a measure of resistance to heat flow through materials. The higher the R-value, the greater the insulating value. This rating is usually used on insulation and walls. Our products are not required to carry a rated R-Value.

The *U-value* is a measure of heat conductance. It is used to rate doors and windows. The lower the U-value, the greater the insulation value, and the better job the door does of reducing energy loss.

The *SHGC* is the Solar Heat Gain Coefficient, which is the ratio of the solar head gain entering the space through a door assembly to the incident solar radiation. Solar head gain includes directly transmitted solar head and absorbed solar radiation with is then reradiated, conducted or convected into the space. As this applies to our doors, the SHGC takes into account the glass AND the wood and frame portions of

the entryway, not just the glass panel.

A *DP-Rating* is the Design Pressure Rating of a product. Homes in any of the wind-born debris regions (such as coastal area installation areas) must use doors and windows with specific “design pressure” (DP) ratings, which include both positive and negative rating numbers. This DP rating is expressed in “pounds per square inch”. The positive number corresponds to pressure created by wind blowing at a door, and the negative numbers represents vacuum pressure on the opposite side (inside) of the door. DP Rating Requirements are “site specific” for individual homes, so consult your architect or home builder for the ratings for your area and your home. The higher the DP Rating is, the more resistant to wind the door is. DP Ratings for 25 GlassCraft Entryways are listed on our web site.

**4. Do individual doors or windows have to be manufactured in specific ways to be in compliance with the energy requirements of the IECC?** No. The IECC codes do not require specific materials (such as low-E glass) to be used in any product.

**5. Do individual doors or windows have to energy code rated at all?** No. There is no requirement for any doors or windows to be tested. If a door has not been rated, the consumer may use the IECC default ratings as provided for in the IECC code Section 102 tables 102.1.3 (2) and 102.1.3(3).

**6. Do individual doors or windows have to be rated at specific U-Values or SHGC Values in order to be in compliance with the IECC?** No. There are three methods to comply with the IECC. The simplest, but most restrictive approach to showing compliance to the IECC is the prescriptive approach. A prescriptive approach calls out required insulation levels for the walls, roof, foundation, windows, doors, and heating and cooling equipment, and also limits window area. All of the energy codes have alternative approaches that allow for energy efficiency trade-offs between components. The alternative approaches are more lenient as well. Yet, there is a misconception that the alternative approaches are too complicated.

THE THREE COMPLIANCE METHODS. Three methods are available to determine compliance with the IECC...the Prescriptive approach, the Performance approach, and the

A *prescriptive compliance method or approach* lists the minimum R-value or maximum U-factor requirements for each building component such as doors, walls, and roofs. This approach is quick and easy to use, but many users find it somewhat restrictive because the requirements typically are based on worst-case assumptions and all requirements must be met exactly as specified. By locating the correct climate zone and looking up the appropriate IECC table of packages, you can verify that your home meets one of the listed home packages listed for that climate zone. The energy performance levels depend on the location of the home and require that single-family homes have no more than 15 percent window area as a percentage of gross area of exterior walls. Homes with greater glazing areas must show compliance using one of the other approaches, and cannot use the prescriptive method.

A Trade-Off compliance method or approach allows you to trade enhanced energy efficiency in one component against decreased energy efficiency in another component. You can, for example, trade decreased wall efficiency (lower R-value) for increased window efficiency (lower U-factor), or increase the roof insulation and reduce or eliminate slab-edge insulation. Typically, this method is less restrictive than prescriptive approaches because components that exceed the requirements can compensate for those that do not meet the code. So, in a home with more than 15 percent window area (for which the prescriptive approach cannot be used) the component approach provides flexibility in deciding such things as whether to put in better windows to avoid having to increase wall R-values.

The Performance compliance method or approach (also called the systems analysis approach) and is the most flexible of the three approaches and the most rigorous. The annual energy use of the building is simulated using computer software and credit can be taken for all energy-efficient features. For example, houses with high performance windows oriented to minimize heating and cooling energy use receive credit for the insulating effects and solar control of the windows. Neither the prescriptive approach nor the trade-off approach account for product installation orientation or solar control.

**7. Does the IECC or IRC allow a door to be exempt from the code?** IECC Code 402.3.3 Glazed fenestration exemption allows that up to 15 square feet of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements.

**8. Do individual doors or windows have to include product labeling for energy performance?** No. If a door or window does not include a product label, then you should use the "default" U-Value or SHG Coefficient value as provided for in the IECC code Section 102 tables 102.1.3 (2) and 102.1.3(3). As GlassCraft completes its product energy testing, we will begin applying the appropriate labels on our door products. We anticipate that this will be complete during the summer of 2007.

**9. Specifically, which product lines have been tested and approved for wind loads?** GlassCraft has received Design Pressure Ratings for many entryway configurations for specific Portobello, Legacy and Estancia entryway configurations. Please refer to the Product Approvals area of our web site for specific configuration. Other GlassCraft Door series (such as the TDL Series and the Buffalo Forge Series) have not yet been tested, and therefore have not received product approval. Buffalo Forge is scheduled to be tested during 2007, as are our Iron Inserts and Fiberglass Doors product.

**10. Are transoms design pressure tested and rated?** Yes. We have tested and received product approvals for all of our transom units, sizes and shapes. 150MPH approvals. These were tested separately from the doors so as to allow these transoms to be installed separately from the entryways, just as a window would be installed. This information is available on our web site.

**11. Specifically, which product lines have been tested and approved for**

**energy efficiency?** GlassCraft has received product energy ratings for only our DecoGlass Window product line. We are currently in the process of having our doors rated for U-Value and SHGC-Values. Therefore, you should use the default values as set by the IECC for now. The IECC has set a default U-Value for operable wood doors with glass of .55, and .39 for solid wood panel doors. In addition, the SHGC value for fenestration with clear IG glass is .55. We will update our web site as soon as this new information becomes available.

**12. What are the Texas Energy Codes?** The Texas Energy Code has adopted Chapter 11 of the 2000 International Residential Code, which corresponds to Chapter 6 of the 2000 International Energy Conservation Code for single-family residential construction. Texas Senate Bills 365 and 5 effectively adopted the IRC state wide in Texas in 2001.

**13. Do GlassCraft products meet the new Texas Energy Code requirements for air infiltration?** We have two product configurations currently approved by the TDI. See this link for more information: <http://www.tdi.state.tx.us/wind/prod/drentry.html#non-impact>. Additional configurations are pending.

**14. Where can I get the GlassCraft Florida Building Code Approvals?** All of the current Florida Building Code Approvals and Engineering Certificates are available on our website. Our Florida code approval number is FL7390. Our approvals are also listed on the State of Florida product approval web site.

**15. Are the approvals on your website?** Yes, all current energy and wind-design pressure approvals are on our web site.

**16. Do you have Impact approvals on your doors?** GlassCraft has not tested any of our doors for impact approval, and none of our doors would pass. Currently, we have no plans to manufacture a door for impact approval.

**17. I need a door for a 130 (140, 150) mph wind zone. Does GlassCraft have a system for this?** Likely yes; however, all of GlassCraft's products are rated by "Design Pressure" rather than wind speed. The architect or engineer of record for the project is responsible for and should be able to supply you with design pressure (DP) ratings required for the door system.

**18. What wind zone am I in?** You should discuss this with your architect or builder or remodeler. The calculations are very complex and include (a) the density of housing around the house, (b) the average roof height, (c) the position of the door on the house, and (d) closeness to the shoreline. In general, the International Code Council's web site has wind-zone charts for general reference.

**19. Who determines the DP rating for my house?** Your architect or engineer of record. The DP rating for door systems varies for a single house depending up the exact location of the door system in the house.

**20. What is the Design Pressure rating of your doors?** GlassCraft has tested 24 different entry systems. Doors are not individually rated, but must be rated with the door, astragal, weatherstrip, sill, door hardware and jamb systems specified, and be approved as an entire entry system. The results of GlassCraft's tests and the

applicable entryway configurations are available on our web site.

**21. I have a component approval of someone else's sill or jamb leg or lockset hardware. Can I still use your approval?** No. There is no such thing as a component approval in the Florida Building Code. GlassCraft has tested its products with specific component parts, and these specific parts must be used to build the entryway correctly. If you choose someone else's components, the GlassCraft approval does not cover that system with the other component part.

**22. If I use a GlassCraft entry system, does that mean that during high wind that I will not have air or water leaks?** No. The entry system was tested to meet a certain test standard, and selected to meet the particular code in your area. Many other variables, however, come into play. Assuming that your entry was properly installed, and the architect properly specified the performance for wind load (DP rating), a GlassCraft system should perform well in these high wind and water situations.

**23. What type of product performance labeling are you putting on your products?** GlassCraft is currently affixing an energy performance sticker on our DecoGlass Windows. In addition, we are placing Design Pressure performance data on our entryways. Soon, we will be placing energy performance labeling on all doors.

**24. Can GlassCraft test a different and new entryway configuration?** GlassCraft understands the desire of builders to use specific configurations. However, testing and associated approvals cost many thousands of dollars for each configuration. In addition, some configurations just do not work, especially at high wind loads. Therefore, GlassCraft cannot test individual and unusual entry configurations. Please note that our current plans are to continuously add additional configurations when possible.

**25. If I cut my door down in height, can I still be approved?** Yes or no. Minor trimming of the edge of a door to fit will not affect the approval. Any modification that significantly alters the structure of the door (ex. re-railing) will invalidate the approval. In that case it is better to arrange a special order door made to height or modify the opening height into which a standard door can be placed.

**26. Can I put a mail slot in my door and keep the approval?** In general, no. A typical mail slot is larger than the maximum damage hole allowed during an impact test. In addition, it provides a stress focus thereby weakening the overall door structural strength.

**27. Does GlassCraft currently offer low-E glass in any of our products?** No, not as a stock option on any product at this time. We do offer it as a custom order product.