

Design Considerations

Like the wall in which they are installed, windows and doors protect the building and its occupants from environmental forces such as wind, rain, and temperature. The combination of wind pressure and driving rain can force water around the seals between the operable sash and frames, weep holes, sealant joints and small pin holes in the surrounding building materials.

Selecting the Right Window/Door class and grade

Window and door ratings are based on a number of performance requirements including uniform structural loading capabilities (wind load), water penetration, air infiltration, and resistance to forced entry. These performance requirements are based on minimum standards set by the American Architectural Manufacturers Association (AAMA) and the Window and Door Manufacturers Association (WDMA). Performance requirements and testing are defined in greater detail in Chapter 7 of this manual.

The AAMA and WDMA rate windows and doors by class and grade based on the ability of a product to meet specific performance criteria. Selecting the right product class and grade is the architect's or contractor's responsibility. Considerations relate to whether the product is intended for use in residential, light commercial, heavy commercial or architectural applications. Other important considerations relate to cost. A client may not be able to afford the best window or door available for the site. Site-specific requirements for product selection must be addressed by the architect, specifier, developer and/or builder in consultation with the client.

Wind Loads

One of the factors used in determining the correct grade window or door is the product's ability to withstand wind loads. Understanding wind loads and how they affect buildings is a complex issue involving a number of factors. When establishing performance expectations for a product, the specifier must consider the geographical location of the building, terrain height of the building, local wind speed, and other factors. These factors are used to establish a design load and performance grade. The performance grade defines the minimum uniform design pressure a product must withstand in order to qualify.

Water Resistance

Water Resistance test pressure have a direct correlation to the wind load design pressure that a product must withstand in order to meet a specific class and grade. The selection of the right class and grade is very important. Improper product selection and/or installation can result in the infiltration of rain, which can cause damage.

Testing Water Resistance

Windows and door are tested for water resistance by spraying the exterior surface with water at a rate of 5 gallons per square foot/per hour. This water application rate is equivalent to a rainfall of 8 inches per hour. (This is more rainfall per hour than a building anywhere in the United States is expected to face.) The test is conducted under a specific static test pressure. When applied to the window or door test sample, this static pressure simulated the load impacted to a product by the actual wind. Wind pressure

is what gives the rain its driving force. Like actual wind might do, this static pressure tends to force the water around the seals between the operating sash or ventilator and frame and through weep holes. Water is typically forced from high pressure areas into areas with lower pressure.

What gives a Window Water Resistance?

Typically windows and doors are designed with compression seals or sliding seals, which are commonly called, weather seals. The design of the weather seal plays an important role when considering both water penetration and infiltration. Compression seals are generally used in projected windows, casements, pivoted windows, and others. Sliding seals are generally used in hung windows and sliding windows and doors.

Compression-sealed products are often designed to be relatively air tight on the inside and are often designed to be relatively air tight on the inside and are often designed with pressure-equalized cavities. Sliding seal products (products which slide on a track) must be designed to allow for the sash to operate with sliding motion. Allowing for this type of operation results in seals that are typically not quite as tight as compression-sealed products. The use of these seals and the product's capability to be pressure equalized has a direct impact on the height of the inside leg of a product. Sliding-seal products have an upturned leg on the interior side, which is generally higher than the compression-seal products. Furthermore these products often have additional features designed into their sill, which allow for the collection and drainage of water.

Affecting Water Infiltration

Manufacturers are constantly testing and developing new products for improved water performance. One solution to solving water infiltration problems is proper product selection. Understanding what can be expected of windows and doors in terms of water performance is important.

Performance ratings can be defined in greater detail. The proper selection of product ratings includes site-specific requirements that must be addressed by the architect, specifier, developer and/or builder.

Obtaining the maximum performance of a product is often on the installer's knowledge of proper installation procedures. Water can easily be forced through cracks and holes around window and door installations from pressure generated by wind. Testing has shown that water can easily enter voids in the seals, nail hole, and other cracks with no pressure at all. This is why it is important to follow the installation procedures completely and conduct a thorough check of the finished work.

Windows and Energy

Windows and doors have traditionally been considered a weak spot in the wall it comes to comfort and energy consumption. Many options, however, are now available to improve a product's energy performance. Learning how products lose and gain heat allows one to choose the right products for a particular job. There are three main ways that a building's energy is transferred through windows and doors.

Air Leakage

Conduction and Convection

Solar Heat Gain

Air Leakage

Air leakage, also called infiltration describes air flowing through and around parts of the sash of the sash and frame. In the summer, outside air coming in brings heat from the outdoors into the building. Cooled inside air is lost to the outdoors. The incoming air can also carry moisture, which can get trapped inside the wall or raise the humidity level in the building. During winter, the opposite happens. Heated air is lost to the outside and cold air is drawn from the outside. Air leakage is driven by pressure. The greater the difference in pressure between indoors and out, the higher the potential for air leakage.

Other pressure effects are less apparent. In a heated building in winter, the “stack effect” creates higher pressure at the top than the bottom as warm air rises within the building. This pushes air up and out of cracks at the top of the building. And draws it in at the top of the building, and draws it in at the bottom.

Heating and cooling duct systems and ventilation fans also create pressure differences by pulling air from one part of the building and, in the case of heating and cooling ducts, supplying it to another part. Doors and windows can be a pathway for air to be pulled in or pushed out by these pressures.

Aside from controlling pressures in the building, air leakage can be decreased by installing relatively airtight products. Note that cracks will leak more when the product is under greater pressure (as from strong wind or high building pressure.) In addition, joints may increase in size under strong pressure, allowing even more air to pass through.

Problems Associated with Air Leaking

- Heat loss in winter

- Heat gain in summer

- Occasional increased indoor humidity in summer, which in turn increases cooling requirements

- Drafts and discomfort for the occupants

- Higher utility bills

Rating Air Leakage

New windows and doors are often rated for air leakage. This is based on a measurement of the cubic feet per minute (CFM) of air that flows through a fenestration product in relation to its total square foot

area. Improper installation adds to a product’s air leakage. The installer must take care to follow the manufacturer’s instructions and the guidelines to avoid creating new passages for air flow.

Reducing Air Leakage

- Use products with an air leakage rating at or below 0.30 CFM/ft²

- Install the products properly and seal them to the building air or vapor barrier.

- Consider the particular climate and conditions. A low air leakage rating may be particularly important for a product installed in a harsh climate or in the path of strong prevailing winds.

Conduction and Convection

Another way heat passes through a fenestration product is by conduction. Imagine you're holding a hot coffee mug in your hand. The outside of the mug will feel warm from the coffee passes through the solid mug. This is conduction, the passage of heat through a solid material from molecule to molecule. If the mug is a tin cup, you will not be able to hold it for long because metal transfers heat more quickly than ceramic or foam. The same principle applies to windows. Heat passes through the glass and frame. The composition of the window will determine how quickly the heat passes through.

Window insulation is also affected by another heat transfer mechanism called convection. Convection is the transfer of heat by the movement of gases or liquid. As warm air inside a building comes in contact with a cold window, it cools and sinks, creating a convection current of air by the window. On the outside, wind blows against the glass.

In both cases, the air movement on the surface of the glass disturbs the air film next to the glass, which is a component of the window's insulating value. Still air is a good insulator, but moving air is not, so convection currents cause quicker conduction of heat through the window.

Conduction is driven by temperature differences. When there is a difference from one side of the product to the other, heat will pass through the glass and frame. Heat transmission increases when there is a greater temperature difference between the inside and outside.

Manufactures can improve a product's insulating value with multiple panes, gas fills, low-e coatings and improved frames and spacers. All of these slow down the conduction of heat through the fenestration product... Installers can help maintain the resistance to conduction by installing the window or door in such a manner that the entire building's weather barrier is continuous.

Problems Associated with Conduction and Convection

- Heat loss in winter

- Heat gain in summer

- Discomfort felt by occupants sitting near a cold surface in winter (often misperceived as draftiness)

- Condensation on the product caused when warm house air contacts a cold window or door surface in winter

- Higher utility bill

Rating Insulation Value

Insulating value is rated in terms of U-factor, which indicates the rate (how quickly) heat flows through a product for each degree of temperature difference between one side and the other. (U-factor is the inverse of R-value - that is, $U\text{-factor} = 1/R\text{-value}$.) The whole product U-factor as determined in accordance with the AAMA 1503-1998 or NFRC 100-97 accounts for heat flow through the entire assembly, including the frame. This is important to consider, as the glass edges and frame usually have higher U-factors (faster heat transmission) than the center of the glass. **The lower the U-factor, the greater a window's resistance to heat flow and the better its insulating value.**

Reducing Conduction and Convection

The needs of the particular client and climate where the products will be used must be considered. The lower the U-factor, the greater the energy savings will be. Lower U-factors result in improved energy efficiency in both summer and winter. However, in very hot climates, blocking solar heat gain can be more important for keeping the home cool in summer.

Solar Heat Gain/Solar Radiation

The third major mode of heat transfer through fenestration products is solar heat gain. Radiation is the transfer of heat from one solid to another through electromagnetic waves. It is the movement of heat through space without being conducted from molecule to molecule (conduction) or carried in a gas or liquid (convection). For instance, you feel radiant heat as you face a campfire, although the air around you is still cold. All parts of your body within “sight” from the fire’s heat will be warmed, but your back will remain cool.

Objects are constantly radiating heat to other objects. In fact, people radiate heat to cooler objects around them, including cold windows and doors. This radiant heat loss from our bodies can have a significant effect on our comfort.

But the biggest source of radiant energy is the sun. When the sun’s radiation strikes glass, some of it is reflected outside, some is absorbed, and the rest passes through the glass to the inside of the building. How much solar radiation passes through a product depends on the time of year, the direction the product faces, how much external shading there is and the ability of the glass to reflect solar heat.

In the winter, solar heat gain is usually welcome, as it adds heat to the building. However, in the summer, solar heat gain is usually welcome, as it adds heat to the building. However, in the summer, solar heat gain through south-, west-, and east facing fenestration products is usually a major source of heat buildup. Windows and doors with tints and spectrally selective low-e coatings keep more solar radiation out of the building than products with single pane clear glass.

Problems Associated with Solar Heat Gain

- Heat gain in summer

- Discomfort for occupants sitting in the path of solar heat gain through the glass

- Fading of drapes and upholstery from the sun’s radiation

Rating Solar Heat Gain

The Solar heat gain coefficient (SHGC) indicates the percentage of solar radiation that passes through a product (including the frame). The glass however has a much more significant impact on the SHGC than the type of frame material. **The products with the lowest SHGC keep the most direct solar heat out of the building.**

Reducing Solar Heat Gain

- The local climate and conditions must be considered. Solar gain is not as significant for north-facing products. For south-, west-, and east-facing products with a low SHGC in hot climates.

- The placement of fenestration products in the house to take advantage of solar gain in cold and

mixed climates must be considered. South-facing windows and doors capture the most winter sun. And overhangs or awnings can keep the higher summer sun from striking glazing products.

A low SHGC decreases solar heat gain in winter as well as summer. A lower SHGC is important in warm climates where summer cooling is more significant than winter heating. In very cold climates, however, it may be beneficial to choose a window with a higher SHGC.

Glass that restricts solar heat gain often restricts visible light from passing through the product as well. Consider spectrally selective glazing products that let in the wavelengths of visible light while blocking out the wavelengths of solar energy that carry only heat.

Use external shading (awnings, landscaping, sunscreens) to reduce the amount of solar radiation from reaching the window or door.

Visible Transmittance

One of the main purposes for putting windows in a building is to provide daylight and a view for the occupants within. However, some characteristics that increase the energy of windows can decrease their ability to perform this task. For instance, double pane glass allows a little less daylight to come through the window than single pane glass. While this amount of reduction in Visible Transmittance (VT) is hardly noticeable, tints and films can further decrease the VT.

A lower solar heat gain coefficient usually comes with the trade-off of lower visible transmittance. However, new technology allows manufacturers to make windows with the best of both worlds. Spectrally selective glass maintains high transmittance of visible light wavelengths while restricting wavelengths that are primarily heat. In some cases it is not important to have high VT. Some people like the extra privacy afforded by a dark tinted window and don't mind the decrease in light transmission, especially in very sunny, hot areas. In office buildings, where controlling glare is very important, a low VT is often desirable.

The VT rating is not important the percentage of visible light hitting the window that is transmitted through to the inside. It is expressed as a value between 0 and 1. Fenestration products' VT can be provided for the entire window, including the frame or the glass alone, which will show a higher percentage of light transmittance.

Condensation

Windows and doors (even relatively efficient ones) usually have higher U-factors than insulated walls, ceilings, and floors. In winter, this means the interior sides of windows and doors are usually colder than other surfaces of the building. This makes them a prime target for condensation, which occurs when warm moist air comes in contact with cooler surface. Warm air can hold more moisture than cool air. The warm air cools as it hits the frame and glass and the water vapor condenses out. the colder the interior plane of the window, the more likely water will condense there.

Air leakage can also contribute to condensation problems. If warm moist air leaks through cracks around the window or door in winter, condensation can occur within the wall, causing mold to grow on the wall and window frame, leading to material degradation.

Another place where condensation can occur is between the panes of a double pane unit of glass. This is an indication that the seal that hold the panes together has failed. This allows any insulating gases to

escape, reducing the energy efficiency of the window or door. The glass often becomes cloudy, obstructing view.

Problems Associated with Condensation

Small amounts of condensation on the coldest days is not a major problem. However, severe condensation has been reported to cause health concerns and cosmetic damage to a building.

Condensation can contribute to the growth of mold, discoloring the product assembly, and triggering allergies in sensitive people.

Condensation can damage painted surfaces and rot wood frames, sash or trim.

Condensation can damage not only the window or door, but also the wall in which it is installed.

Other Factors Affecting Condensation

Since we see condensation associated with windows and doors, we tend to think of the products as the “problem.” However, condensation is actually the result of several factors, including:

Relative humidity inside the building

Interior temperature

Pressure that increases air leakage

Outdoor humidity and temperature

Solar radiation

the direction the product faces

Rating Condensation

The Condensation Resistance Factor (CRF), developed by the AAMA, allows window purchasers to compare the potential for serious condensation on different products (AAMA 1503-98 “Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows”).

Selecting a proper CRF involves determining the average inside relative humidity and the exterior design temperature. The exterior design temperature can be obtained using ASHRAE tables, which give city-by-city numbers.

Reducing Condensation

Most of the factors causing condensation cannot be addressed by the fenestration product purchaser or the installer. However, one can choose a product that minimizes the likelihood of the problems, especially in buildings or rooms that are prone to condensation problems. In general, bathroom and kitchen windows are most prone to condensation. Especially for these windows:

Windows and doors can be selected with a low U-factor.

Windows and doors can be selected with **warm-edge spacers and insulating frames** to help reduce condensation.

Non-thermal metal frames, which conduct heat quickly, can be avoided. Frames with a high Condensation Resistance Factor can be selected.

Homeowners may install and use exhaust fans in bathrooms and kitchens to remove excessive

interior moisture and to avoid using humidifiers in winter.

Single pane glass is prone to condensation. Products with lower U-factors (such as double pane glass and glazing products with gas fills and low-e coatings) have a warmer interior surface in winter, which reduces condensation. However, because the heat transfer is greater at the edges of the glass, some of these products may still experience condensation around the edge. Products with “warm-edge spacer’s and insulated frames can help keep inside surfaces of the whole assembly warmer, thereby reducing condensation.

Glazing and Framing Considerations

To improve the efficiency of windows and doors, manufacturers often offer a number of options which have an impact on the glass and frame. They can, in fact, customize the product to achieve specific values of conduction resistance, solar heat gain, visible transmittance, condensation resistance and air leakage. Some of the improvements applied to the glass are low-e coatings, tints, and gas fills. The frame and glass edge can be improved by using less conductive materials, designing in a thermal break, or using warm edge spacers between the panes.

Low-e Coatings

A low-emittance (low-e) coating is virtually a clear microscopic metal oxide layer applied to a surface of one or more panes of glass. The coating allows certain wavelengths of radiation to pass through more easily than others. A low-e coating can improve the insulating value of a window or door as much as adding a third pane of glass.

A typical high-transmission low-e coating let in heat from the sun, but helps reflect the buildings heat back inside. These coatings are excellent for cold climates, and are particularly useful for south-facing fenestration products. Coatings are frequently placed on the inside of the exterior pane of glass/

Some new windows have spectrally selective low-e coatings. These windows are good for mixed climates where both heating and cooling are typically needed. They help restrict the heat energy from the sun but allow much of the light to come through, which is beneficial in summer, and keeps the home’s heat from radiating outside which is beneficial in winter.

Tints

Various tints are available to reduce glare from the outside on sunny days and to reduce the amount of solar gain through the glass. Tints are primarily used in light commercial buildings but are occasionally used in residential applications. Homeowners often retrofit a tinted plastic film onto existing glass to reduce solar gain or increase privacy. However, homeowners should be aware that tinting may result in increased heat build-up within the glass panes, thus increasing the potential for glass breakage due to heat stress. Some window and door manufactures will consider their glass warranties void if such tinted films are applied to their products.

There are two types of tints:

Tints that restrict light as well as heat gain. These are typically the bronze and gray tints.

Spectrally selective tints that reduce heat gain allow more light to be transmitted into the building. These tints appear light blue or green.

Reflective coatings or films are also often used for light commercial buildings to reduce glare and heat gain. These are similar to reflective (mirror) coatings used on sunglasses. Like standard tinted glazing, these coatings can reduce light and visibility through the window.

Gas-Filled Units

The dead air space between panes in double-or triple-paned glass lowers its U-factor. In a standard, double pane fenestration product, it is still air on the outside surfaces of the glass that provides most of the insulating value. To further improve thermal performance manufacturers often fill the space between the panes with inert and nontoxic gas that insulate better than air. Inert gases typically uses are:

Argon – common and relatively inexpensive.

Krypton - more effective than argon, but more expensive.

Framing Materials

The frame material and style also have an effect on a product's energy efficiency. In double pane windows and doors, conduction is often higher through the frame than through the glass.

Spacers many variations of edge design have been tried over the years. Currently the design most used by manufacturers incorporates spacers and polymer sealants. The layers of glass are separated by a spacer, and sealant is applied around the entire perimeter. A desiccant is included in the spacer to absorb any residual moisture between the panes after sealing the perimeter.

In connection with the sealant, the spacer performs several functions. It helps to accommodate stress included by thermal expansion and pressure differences; it resists the passage of water vapor into the space between the pane; and it helps keep any insulating gases, such as argon or krypton from leaking out. Some examples of spacers are:

Aluminum

Stainless steel

Improved design metal

Insulating silicone foam, extruded vinyl, or pultruded fiberglass

Thermal break/barriers incorporated into metal spacers.

Sound

Windows and door can be pathways for noise from traffic, airplanes, or noisy neighbors to enter the building. Noise transmission through windows and doors is affected by the amount of air leakage because the sound waves are transmitted through air. It is also affected by the thickness of the glass and air spaces between the panes.

In general, what is good for energy efficiency is good for noise reduction. Properly installed windows with low air leakage ratings and low U-factors will keep a house quieter than single pane. Leaky windows. Some windows and doors are specially designed to minimize sound transmission.

Noise Ratings

Windows are sometimes rated for sound transmission. In the past they were given a Sound Transmission Class (STC) rating, measured in decibels (dB). However, this rating is intended for measuring transmission of speech and office equipment noise through interior partitions. An Outdoor-Indoor Transmission Class (OITC) rating is more appropriate, and has been developed by AAMA and ASTM. A window with higher noise rating will block more noise.

Sound Ratings and Reducing Sound

Products can be used that have low air leakage ratings and double panes with glass of unequal thickness, laminated glass, and or gas fills.

If noise is a particular concern, consult the manufacturer for specifications on the sound transmission of the products.

Install and seal the windows and doors properly.

Architects and designers can consult tables of acceptable sound levels for different types of light commercial and residential buildings, and choose products accordingly.

Safety Considerations

There are several critical safety issues that impact the design and function of various fenestration products:

- Fire and Egress
- Safety Glass
- Insect Screen Safety

Fire and Egress

Building codes usually specify that all bedrooms in the first three stories of a building need at least one operable window or exterior door approved for emergency escape or rescue, which must open directly onto a public street, alley, yard, or court. An “egress” window must be operable from the inside without the use of tools.

Safety Glass

Most codes require safety glass where a window or door (with glass) may be subject to human impact.

Insect Screen Safety

Insect screens prevent the passage of insects, not children. The latches that keep the screens in place allow for easy removal for cleaning and storage. These latches will not hold up under the weight of even a small child. Additionally, screen mesh can be cut torn, and kicked out of the screen retainer tracks.

Thousands of children are injured or die in the United States due to accidental falls from unprotected window openings. If the homeowner asks about screen safety, recommend the following:

Whenever possible, open the windows from the top rather than the bottom.

If you open the windows from the bottom.

If you open the windows from the bottom, only open them 4" or less.

Do not place furniture that a child could climb on in front of an unguarded window.

Consider using window guards to protect children from falls.

If you decide to install window guards, make sure they are made of strong materials, installed correctly, and in accordance with local building and/or fire codes.

Never attach a child protection guard to a window frame that is rotten or loose.

Remember that windows screens are meant to deter insects, not children. They can give a false sense of security and are meant to prevent a child from falling.

Plant shrubs or grass under the windows wherever possible to cushion potential falls. The surface can greatly affect the degree of injury sustained from a fall.

Window Labels

Independent Organizations provide uniform ways to evaluate products. Labels provide the information needed by the designer, installer, and consumer to compare performance ratings, as well as its physical specifications and compliance with standards.

Temporary Labels

Many new windows and doors carry temporary labels that indicate the energy specifications for the product. These may include labels from AAMA, NFRC, Energy Star, or local energy agencies.

NFRC

The National Fenestration Rating Council label indicates the window's energy performance characteristics. The NFRC is a nonprofit public/private collaboration of manufacturers, trade associations, builders, designers, specifiers, code officials, consumers, utilities and regulators. It does not set minimum standards or mandate specific performance levels.

The NFRC currently rates U-factor, Solar Heat Gain Coefficient, Air Leakage, and Visible Light Transmittance for two standard sizes of windows. In the near future the label will also include a condensation resistance rating and an annual energy performance rating.

Although the NFRC certification is voluntary, many manufacturers is voluntary, many manufactures now certify their products. In many states, building codes require certification as evidence of compliance with code standards. If there is no label, ask the manufacturer for the window's NFRC ratings or look in the window's NFRC ratings or look in the Certified Products Directory, which can be purchased from NFRC.

Energy Star

The Energy Star Windows program is a voluntary partnership between the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the fenestration industry to promote sales of energy to promote sales of energy efficient windows and doors.

Windows and doors started to carry these in 1998.

To get an Energy Star label, a window or door with glass must meet certain energy performance criteria, depending on the area of the United States where the window is sold. The label does not give specific energy ratings but indicates that the window's energy ratings make it a high-performance candidate zone.

The Energy Star program splits the United States into three regions on whether buildings in each area require primarily heating, primarily cooling, or both heating and cooling.

AAMA WINS LABEL

At the request of building code officials, AAMA developed a new temporary label. The AAMA Window Inspection and Notification System (WINS) label may include information on products ratings, anchoring requirements, installation instruction, and special product qualifications, such as approval by local code evaluation services. The WINS label may also incorporate the NFRC temporary labels and the Energy Star label.

Permanent Labels

Permanent labels provide for performance and manufacturer tracking for the life of the window. The labels are typically attached in a location unseen when the window is closed. There are a few national organizations that provide permanent labels. Two of these organizations are:

AAMA – American Architectural Manufacturers Association

WDMA - Window and Door Manufacturers Association

AAMA and WDMA also provide the test procedures and laboratory certification to rate windows for permanent labels.

The American Architectural Manufacturers Association (AAMA) provides labels for vinyl, wood, metal, and composite windows and doors. The certification label shows that the window complies with a certain class and minimum grade (its ability to withstand wind load, and meet a given water resistance and air filtration rate).

Independent third-party laboratories (accredited by AAMA) test the performance of windows and doors for the manufacturer, following test procedures outlined by AAMA and WDMA in their joint standard AAMA/NWDA

The Window and Door Manufacturers Association labels wood and vinyl windows and doors that meet WDMA industry standards. The WDMA certifies the class and grade for wood and vinyl products.

The AAMA label has a four-part code, indicating the product type, performance class, performance grade, and maximum size tested.

The product type indicates the window style, such as casement window or hinged glass doors. The performance class shows the type of building for which the window was designed.

The performance grade gives the design pressure. In order to obtain an AAMA or WDMA label,

windows must meet the minimum design pressure for their performance class.

Windows can also be tested at higher design pressure (grade) rating. The performance grade is the number that the installer should use to check against the architectural specifications.

The maximum size tested may seem like a minor detail when looking at a window's label. However, the size of the window can have a great effect on its structural capability.

Label Removal

The AAMA and WDMA certification labels are permanent and are left on the window. They are usually located on the inside of the frame. Where they are out of sight when the window is closed.

Temporary labels, such as WINS, NFRC, Energy Star, or labels from other state or local organizations are removed after the window is inspected. When removing temporary labels, follow manufacturer's instructions. Use extreme caution when using razor blades to remove labels as they can scratch the glass.

Child Safety Labels

Most new window screens, such as insect screens and sunscreens, carry a child safety label indicating a fall hazard warning. This label indicates that the screen frame to prevent children from falling out. The label is permanent and is affixed to the screen frame where it can be seen when the window is open.