PRESS RELEASE

All about glazing

Improving the glazing options in your home's windows and doors can dramatically improve its thermal performance and thereby reduce your monthly electricity bills. Charl Jacobz from Swartland Wooden Windows and Doors offers an overview on the various glazing options available to homeowners.

04 December 2012, Johannesburg: It is estimated that around 40% of the total energy loss of any home occurs through standard, single pane windows. "By upgrading your glazing to a more energy-efficient option, and you can ensure impressive savings on your energy bills, as well as enjoying a home that is warmer in winter and cooler in summer," explains Charl Jacobz from leading local wooden window and door manufacturer, Swartland Wooden Windows and Doors.

What is glazing?

Glazing is the technical term used for the actual glass part of the windows and doors in your home. Glazing is mounted in various ways into frames, and a specialist glazier traditionally undertakes the installation. That is, unless you have purchased Swartland's Ready 2 Fit wooden windows and doors, which come pre-glazed and pre-sealed, ready for installation.

Says Charl: "Historically, all windows were single glazed, which means they comprised a single pane of standard glass. Today, however, there is a wide variety of glazing options to choose from, which offer various benefits – ranging from increased energy efficiency, noise reduction, and security." However, before we can delve into the various glazing options, it is essential to first understand how thermal performance is calculated.

Thermal performance

"Thermal performance can be divided into two sections – namely, loss of heat through ill-fitting windows and loss of heat through materials and their properties," explains Charl. He says that energy performance ratings for windows and doors are calculated using the following factors:

- **U-values:** The U-factor, otherwise known as the U-value, is the rate at which heat is transmitted through the arrangement of windows and doors in a building. It takes into account all the components that make up the window or door, such as the frame, the space between the double-glazing, and of course, the glass itself. Glass coatings and the type of glass in the make-up of the double-glazing unit also plays a role in the U-value calculation. Each glazing option has a different U-

value, and each delivers different levels of thermal performance. Some options are more resistant to impact, while others offer better thermal performance. And sound insulation.

- **Solar heat gain coefficient (SHGC):** This measurement indicates how well a product blocks out heat from the sun. The lower the number, the better, as a low SHGC rating means that the window in question will transmit less solar heat from the exterior to the interior, and vice versa.

Glazing options

There are many different glazing options to choose from, says Charl: "Swartland's windows and doors can come pre-glazed with your choice of glazing options – whether it be standard 4mm glass, or a thicker 6,38mm Safety Glass that is in accordance with SANS 10137. Double-glazing and Low-E glass is also available on request, depending on the application and level of thermal and acoustic insulation required."

He notes that the most common glass used for residential applications is either 3mm or 4mm clear plate glass, but notes that, to a large degree, the size of the pane dictates the thickness of the glass required: "For instance, 3mm glass would be used when the maximum size of the pane is 0,75m wide, whereas, 4mm glass would be used where the maximum sixe of the pane is 1,5m wide. Where the pane measures a maximum width of 2,1m, 5mm glass would be used, while 6mm glass would be used is the maximum size of the pane measures 3,2m in width."

Charl adds: "Safety glass is required for all doors, as well as windows alongside a ramp or stairs. Floor-to-ceiling casement windows also require safety glass on the bottom panes. 6,38mm Laminated Safety Glass is the most popular safety glass used for residential applications. When installing glass in your home, your builder has to conform to the safety regulations contained in the SANS 10137 Code of Practice. When it comes to safety glazing requirements – Toughened Safety Glass and Safety Glass need to conform to the guidelines contained in SANS 1263. Luckily, if you purchase Swartland's Ready 2 Fit range of wooden windows and doors, all the glazing used meets all the minimum building criteria, to make your life easier."

Charl offers a broad overview on the various glazing options available today, which are mainly used for residential applications:

Double-glazing: Double-glazing is the glazing process in which a window is formed by two panes of glass with the space in between filled with dehydrated air. The two panes of glass forms a layer of insulation and are separated with an aluminium spacer and encapsulated in a primary silicone coating, and then sealed with a secondary silicone or bitumen (waterproofing agent) sealant. The air trapped between the panes of glass form a layer of insulation.

Double-glazing substantially reduces and regulates thermal loss from the inside and solar heat gain from the outside – as such, it is able to reduce the energy spent on regulating the temperature in your home by as much as 50%. Double-glazing is also environmentally friendly. Our homes cause around 28% of all carbon dioxide emissions, and replacing single pane windows helps to reduce these emissions and combat energy loss. Double-glazing also provides excellent security because its composition and design make it very difficult to break. It is also very effective in providing great acoustic insulation. This reduces outside noise levels and contains the noise levels from within too.

Independent tests by the South African Fenestration and Insulation Energy Rating Association (SAFIERA) confirmed that Swartland's range of double-glazed wooden windows are the most energy efficient tested windows in the country.

Heat-absorbing tints: These tints change the colour of the glass so that it absorbs a large fraction of the incoming solar radiation, thereby reducing the SHGC, visible transmittance and glare of the glazing. Grey- and bronze-tinted windows tend to dramatically reduce light penetration, as well as heat, as they are not spectrally selective, while blue- and green-tinted windows offer great penetration of visible light, while simultaneously reducing heat transfer.

Low-emissivity coatings: Otherwise known as Low-E coatings, low emissivity coatings on glass use insulated glazing to control heat transfer. A Low-E coating comprises a microscopically thin metal or metallic oxide layer that has been deposited directly on the surface of the glass, which cannot be seen by the naked eye. This coating lowers the U-factor of the window, and they can also control the SHGC levels. Although glazing with a Low-E coatings tends to be a bit more expensive when compared to traditional glazing, they are known to reduce energy loss by as much as 30% to 50%, ensuring that they pay for themselves many times over in the long run.

Reflective coatings: These are used to reduce a window's glare and its SHGC by reducing the transmission of solar radiation. However, they tend to block out more light than heat. They usually comprise thin, metallic layers, which are available in a range of colours. However, since they block out so much light, the reduced cooling energy demands can be offset by the need for additional electrical lighting, so they are not a very energy-efficient alternative.

Spectrally-selective coatings: Specialised Low-E coatings are available with spectrally-selective filters, which are able to filter out 40% to 70% of the heat that is normally transmitted through insulated window glass, while simultaneously allowing in maximum light transmission. These coatings are designed to optically reflect particular wavelengths, while remaining translucent to others. Such coatings are regularly used to reflect the infrared portion of the solar spectrum, to reduce heat transfer – to create glazing with a

low U-factor, low SHGC, but with high visible transmittance. Studies have shown that glazing with spectrally selective coatings can reduce the energy requirement for cooling a space by as much as 40%.

Safety glass: This is glass with additional extras that make it less likely to break, or pose a threat when it is broken. Widespread designs include toughened safety glass (also known as tempered glass), laminated glass, and wire mesh glass:

- Toughened glass is processed by controlled thermal or chemical treatments to make it stronger than normal glass. This glass boasts balanced internal stresses, so that when the glass is broken, it crumbles into small, granular chunks that are not as harmful as the traditional splintered and jagged shards. It is commonly used for vehicle windows, shower doors, architectural glass doors, countertops, cooking hobs, and sliding doors for example.
- Laminate glass is held together when it shatters by an interlayer, which is commonly made of polyvinyl butyral (PVB), which is sandwiched between two, or more layers of glass. This interlayer keeps the layers of glass bonded together, even when broken, preventing the glass from breaking up into potentially dangerous shards and fragments. It is often used in applications where there is a possibility of human impact of if the glass could fall from a distance, such as for skylights, extra large panes of glass. The PVB also gives the glass a much higher level of sound insulation and blocks 99% of any incoming UV rays.

“So, as you can see, there are a lot of options when it comes to glazing – each with their own strengths and weaknesses. As such, it is essential to consider which glazing to choose for each specific area in your home, for optimum energy-efficiency, safety and visual translucence,” concludes Charl.

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Released on behalf of Swartland Wooden Windows and Doors (www.swartland.co.za) by The Line Communications (www.theline.co.za, ant@theline.co.za).