



# Thermal Performance Just as Crucial in Summer as Winter

BY DEAN LEWIS

**A**fter the winter season, as the landscape turns to green (in more ways than one), we are reminded that thermal efficiency is not just for winter anymore.

As we all know, U-factor cuts both ways. Whether the direction of heat transfer is inside-out or outside-in, the requirements for reducing heat conduction (i.e., minimizing U-factor) are well-known. An allied parameter is solar heat gain, measured by the solar heat gain coefficient (SHGC), which decreases as less solar heat is admitted.

Consumers and contractors are getting the message of year-round energy savings and learning about the ways to achieve it more than ever before, which is likely to lead to increased demand for high-performance products.

## The Proof is in the Reports

For example, a report by Harvard University's Joint Center for Housing Studies (JCHS) notes that, in the next five years, the focus of remodeling spending will shift from upper-end discretionary projects (such as designer kitchens with granite countertops, etc.) to replacements and upgrades, particularly energy-efficient retrofits such as window replacement.

Similarly, the National Association of Home Builders' (NAHB) New Home 2015 survey of builders of new homes collected the predicted characteristics of an average new single-family home in 2015. Among the study's key findings is that most new homes will have some variant of a "great room" (combined kitchen-family-living

room). Additionally, low-E windows were ranked the most likely green feature of the 2015 home.

## Codes Keep Getting Tighter

Further driving the trend toward acceptance of more efficient windows, the performance ante has been raised by various codes, standards and government programs. For example:

**Low-E windows were ranked the most likely green feature of the 2015 home.**

**International Energy Conservation Code (IECC).** Aiming to achieve energy savings of 30 percent relative to the 2006 model code, new prescriptive window requirements call for U-factors of 0.50 or less in southernmost climate zones, ranging down to 0.32 in northern climes. Permissible maximum SHGC varies from 0.25 in southern areas, with no prescribed maximum in northern zones where solar heat gain helps offset winter heating costs.

**ICC-700 National Green Building Standard (NGBS).** Jointly developed by the International Code Council (ICC) and the NAHB and published with ANSI approval in 2009 – the NGBS defines four certification-like green compliance threshold levels for residential construction. Builders can self-certify that they meet bronze, silver, gold or emerald levels, with the latter said to incorporate energy savings of 60 percent or higher.

ICC-700 requires ENERGY STAR® compliance for fenestration products or optionally defaults to different NFRC-certified U-value and SHGC requirements that vary according to rating points that they

earn and by climate zone. Maximum points are awarded for maximum U-factors as low as 0.25 in the North up to 0.45 in the South, with accompanying SHGCs ranging from 0.25 in the South with no maximum in the North.

**EPA ENERGY STAR.** The 2009 update to Energy Star door and window criteria calls for U-factors ranging from a maximum of 0.60 in the

South to 0.30 in the North, and SHGC values of no more than 0.27 in the South with

no maximum for the North (although there are U-SHGC trade-offs permitted in the North).

**DOE R-5 High-Performance Windows Program.** Because price is the principal barrier to more widespread market commercialization of high-performance windows, the aim of the Department of Energy's (DOE) High-Performance Windows Volume Purchase Program (formerly known as the R-5 [equivalent to U = ~0.20] Program) is to make highly insulating windows more affordable and thereby reduce average heat loss through the windows by 40 percent.

Forward-looking manufacturers need to consider the inevitable trend toward ever tighter energy efficiency standards and consumer demand that will go beyond R-5, including ratings that are harder to achieve economically. |

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