

Land of the Three?

The State of Triple Glazing in the United States

by Nick St. Denis

Photo: JE Berkowitz

Triple glazing has taken some time to catch on in the United States. However, increased stringency in codes for new construction, as well as added benefits in retrofit work (such as the project pictured above), could help push the technology along.

Triple glazing is commonplace in Europe, particularly in colder climates and due to the region's more stringent energy codes.

But the technology has taken a bit longer to find traction in the United States.

That technology could be poised for growth in the coming years, so *Architects' Guide to Glass & Metal* took a look at some factors that could—or already are—contributing to modest gains in the adoption of triple glazing in the U.S.

Better Buildings

The Department of Energy's (DOE) Better Buildings Challenge, an ongoing initiative that strives to make commercial and industrial buildings 20 percent more energy efficient over the next 10 years, could be a driver in triple glazing, particularly in retrofit applications.

"With the president's Better Buildings Initiative, commercial building owners are going to need to address a host of issues with their older stock of holdings," says Darrell Cherry, business development manager at JE Berkowitz and Renovate. "Windows are a central component of that review and/or upgrade."

"Given that buildings consume as much as 40 percent of the energy used in the U.S. (according

to the DOE), there is a great need to bring these older buildings into line with newer energy codes and ratings. One way to do that—and we think the most cost-effective—is to upgrade the current, single-glazed windows to highly energy efficient triple-glazed windows."

David Warden, enerGfacade brand manager at YKK AP America, says the 20-percent goal can be accomplished, in part, by increasing awareness and offering incentives to builders and building owners. "This has worked historically as long as the building market is healthy and willing to drive change by bringing underutilized technologies, like triple glazing with advanced aluminum framing, to the forefront," he says.

"... Historically, program requirements drove architects and builders to close in the space and focus on envelope efficiencies like insulation, HVAC and roofing systems—ultimately discounting fenestration as a viable solution, except in cases where a glass façade system was the primary design feature of the building. However, most studies show that by upgrading the fenestration system, the maximum return on energy savings is realized."

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Occupant Comfort

The energy savings may take the forefront in the conversation of triple glazing, but there are other factors at play, including the increased occupant comfort the technology can provide.

"Let's not forget that in addition to energy savings and, thus, money, there is also a comfort factor for tenants," says Cherry. "This is improved no matter the region. Happier, more comfortable tenants in a newly upgraded building is a good thing."

Warden agrees.

"Daylighting, natural ventilation, and better thermal-performing fenestration systems are starting to gain traction because studies show that providing quality views and natural daylighting improves occupant comfort, reduces stress, and increases performance," he says.

The Hold-Up

So with triple glazing's bright potential, what factors are holding the technology back?

Cost is certainly a concern, as builders are striving to get a return—even if it is far down the road—on the investment. But there's more at play than just the dollars.

"Most storefront designs currently do not accept triple glazing. These systems are not easily modified to accept triple glazing options," says Warden.

Additionally, recent advancements in the utilization of low-E coatings on the second and fourth surfaces of the traditional 1-inch IGU increase performance and may further delay the adoption of triple glazing.

Another concern, adds Warden, is that "Triple glazing increases the mass of the system, which has a direct impact on the structural deadload requirements for the framing system and the building foundation and floor loadings."

A Place for Thin Glass?

Some manufacturers have started developing ultra-thin glass for architectural purposes, and the glass has been lauded at recent trade shows and used in some niche applications. However, the industry is still trying to figure out where exactly the technology fits.

Dirk Schulte, vice president, business development for contract glazing firm APG International Inc. in Glassboro, N.J., thinks one possibility is using it as an architectural component—particularly as the third lite of a triple IGU.

If the interior lite is replaced with a thin glass product, it could significantly reduce the added weight of a triple IGU compared to double glazing.

"The biggest application (of thin glass) I see is its use as an integral member of triple-glazed insulating glass units," he says. "We will see a lot of



Photo: JE Berkowitz

Occupant comfort, especially in office environments, is a major benefit of triple glazing.

triple IGUs, [and] thin glass could be used as that intermediate glass layer."

European Influence

Warden says that while it's too early to tell if the U.S. market will move to triple glazing given its different designs and building needs from Europe, there will continue to be a level of influence from across the pond, particularly in regions that demand protection against harsh winters.

The institutional sector may take the lead.

"We see increased demand for triple glazing in medical, government, and mixed-use buildings which could be influenced by data coming from Europe," says Warden. "Time will tell if triple glazing can compete with technology advancements of traditional 1-inch double-paned IGUs paired with enhanced framing systems."

Looking Forward

"Triple glazing is a highly efficient option that is being explored in architectural window and curtainwall applications," says Warden. "I believe triple-glazed fenestration systems will become more relevant as green building codes gain more acceptance and local codes demand more stringent energy performance."

Cherry thinks the U.S. will "undoubtedly" follow Europe's lead in triple glazing requirements in new construction. He also believes the potential will be realized in retrofitting.

"Upgrading older buildings allows them to become much more competitive with new construction, allowing for greater profitability for those who undertake such renovations," he says.

And after all, says Cherry, "There is nothing 'greener' than a current building." **AGG**

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