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Volume 24 • Issue 5

September/October 2010

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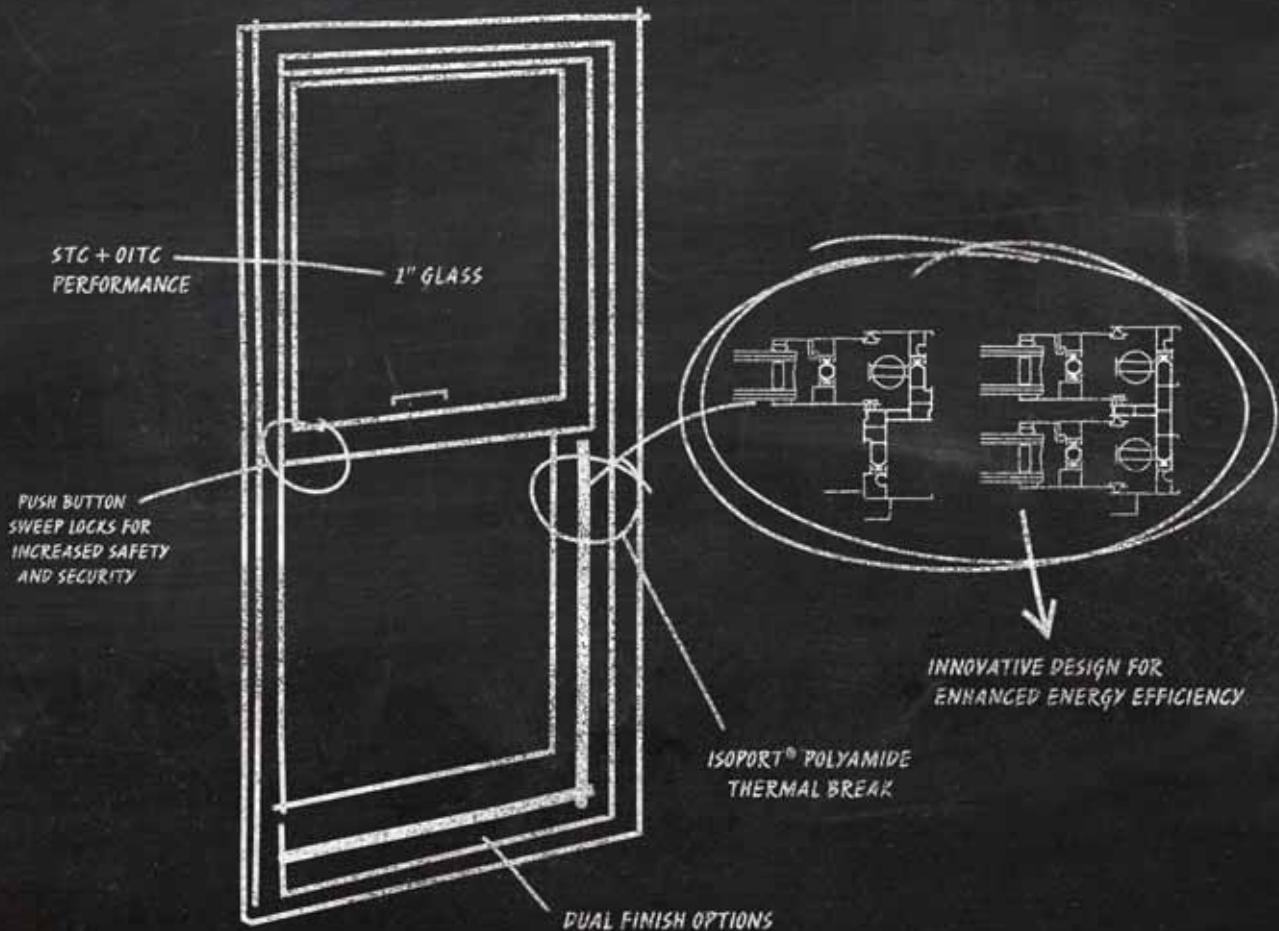
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On the Cover

The Cleveland Clinic, Lou Ruvo Center for Brain Health in Las Vegas, was designed by Gehry Partners and features glass from Viracon Inc. and aluminum systems from Kawneer. Las Vegas-based Sierra Glass & Mirror served as the contract glazier.

Photo provided by Sierra Glass & Mirror.

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Glass Tech

Building Safer Buildings
GANA, PGC Release Manual on Protective Glazing

by Ashley M. Charest



While protective glazing applications have been at the forefront of government and high-security commercial building design over the past 15 years, a comprehensive document that encompassed all basic and intermediate information on the subject has not been available. This changed two years ago when the Glass Association of North America (GANA) and the Protective Glazing Council (PGC) International began a joint venture to create such an industry resource. While no singular document can cover everything there is to know about protective glazing, the GANA/PGC Protective Glazing Manual serves as a starting point, and is a guideline for information vital to the success of a project using the various types of protective glazing products.

"The Glass Association of North America was proud to work with PGC International to create this necessary document on protective glazing products and uses," said Bill Yanek, GANA executive vice president. "Our goal is to place this document into the hands of every architect, designer, engineer, specifier and installer that uses or will use protective glazing products in today's buildings."

Subject by Subject

To fully understand the complex variety of options offered by protective glazing, a person must first understand the individual products that can be combined to make an effective protective glazing system. The GANA/PGC Protective Glazing Manual begins with an introduction of overall protective glazing systems and then discusses many components: glass, film, interlayers, and polycarbonate sheets. The beginning sections of the manual also touch briefly on safety and building code issues that must be taken into immediate consideration when designing with such products.

The largest section of the manual deals with the individual application processes that can offer various levels of mitigation using productive glazing products. Those applications include:

- Ballistics resistance;
- Blast resistance;
- Quick egress through protective glazing products;
- Fire-rated glazing products;
- Forced-entry protection; and

"Our goal is to place this document into the hands of every architect, designer, engineer, specifier and installer that uses or will use protective glazing products in today's buildings."

- Hurricane and seismic resistance.

Each chapter on these applications discusses in detail the uses, limitations and guidelines when applying protective glazing products. The sections also highlight important codes, specifications and useful tables when designing protective glazing applications for a building project. In addition, the manual also features full-color graphics that will be helpful for individuals dealing with and/or specifying protective glazing.

Additional Resources

Proper care and handling, to which the manual devotes an entire chapter, is vital to maintain the function of these products. Also included are a quick list reference of industry glossary terms, one compiled list of protective glazing resources and standards, and a list of organizations that can help a designer, architect or installer better utilize and/or understand the product as a whole or the components as separate pieces.

In addition to being available in hard copy and CD format, the manual will also be offered in e-book format, accessible to view via e-book readers such as Amazon's Kindle®, the Sony Reader® and the Apple iPad®. The manual is currently available for purchase online at www.glasswebsite.com or www.protectiveglazing.org. **AG**

Ashley M. Charest is the account executive for the Glass Association of North America in Topeka, Kan. Ms. Charest's opinions are solely her own and not necessarily those of this magazine.



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Passing the

The Power of Certified and Tested Units: 25 Years of Proof

by Margaret Webb

The Insulating Glass Manufacturers Alliance (IGMA) 25-Year Field Correlation Study brings real-world performance and results to further establish a case for quality, tested and certified insulating glass (IG) units. Third-party certification of IG units is critical in establishing the integrity of these products. Certified and tested IG units are an assurance to architects and specifiers that the products have demonstrated quality and performance according to the latest, up-to-date standards.

The purpose of the 25-year field correlation study was to determine the correlation of actual in-service IG unit failures to the ASTM E 773 Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units and ASTM E 774 Standard Specification for the Classification of

the Durability of Sealed Insulating Glass Units for classes C, minimum performance; CB, moderate/mid-level performance; and CBA, maximum performance (see box 1 on page 7 for more details; Editor's note: both ASTM E 773 and ASTM E 774 are now obsolete. The replacement document is ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation).

Background

The IGMA 25-year field correlation study established baseline and ongoing quantitative statistics on long-term performance. Comparisons can be difficult as these units are commonly installed in different environments and under various other conditions, such as different frames, locations and facing different directions.

IGMA now has the quantitative results that prove sealed IG units tested and certified to the most stringent industry standards carry better in-the-field performance than those that are not. The study was an ambitious project that examined in-service IG units in specific residential and commercial buildings in various locations across the United States. The project began in 1980 with reports issued at the 10-, 15- and finally, 25-year marks. The study was based on long-term analysis of in-the-field building performance and examined in-service insulating glass units in specific residential and commercial buildings located in all regions of the United States. Almost all the units studied faced south or southwest.

The standard for visual failure was defined as "moisture, fog or dirt collection on the glass lite surfaces located within the air space," exhibiting "permanent material obstruction of vision through the unit due to accumulation of dust, moisture or film on the internal surface of the glass." In the first seven years, frost points were taken on almost all the units. Visual inspections were completed eight times during the first ten years and again at the 15- and 25-year point.

In 1990 an additional study was undertaken to



The IGMA 25-year field correlation study looked at seal failures in a variety of commercial and residential projects throughout the United States.

Test

examine more than 10,000 CBA units in 102 buildings from units. This part of the study was designed to include some of the newer seal and edge technologies that were added since the original study.

The Results

Although applications were wide ranging, actual performance varied little from hot to cold or wet to dry climates or sea level to mountain exposures. Eighty percent of the buildings had no insulating glass failures after 25 years. Glazing systems that held water at or near the edge sealant had accelerated 60 percent of the failures that did occur in the remaining buildings. The importance of managing water in the glazing cavity is a critical factor in the performance and longevity of certified insulating glass units. Water held at or near the edge seal of an IG unit will result in premature failure, cause structural damage to the glazing system and may result in the formation of mold (see box 2 above for more information on the study's results). The formation of mold and its effect on the occupants of a structure continues to be a prime health and safety concern for architects when designing buildings.

Based on the information obtained from the 25-year data, it is estimated that the failure rate of C and CB units is in excess of 20 percent, due to the number of buildings re-glazed and known systems that were not properly performing to keep water away from the IG edge. In addition, the number of C and CB units demonstrating failure in the 25-year study (14 percent) had approximately three to four times the number of failures of the CBA units (3.6 percent). This clearly demonstrates that the units that achieved the CBA or highest level of certification outperformed the units that had only achieved the C or CB level of certification.

IGMA's recommendation is that IG units should be certified to the ASTM E 2190 standard for improved long-term durability against failure and include glazing of units in accordance with IGMA standards. **AG**

Box 1: Summary of ASTM E 773/E 774 Test Specifications

Class	High Humidity	Accelerated Weathering	Frost Point
	(days)	(cycles)	
C	14	140	-34°C (-30°F)
CB	+14	+56	-29°C (-20°F)
CBA	+14	+56	-29°C (-20°F)

Box 2: Summary Survey Failure Rates

	Phase I, 1980-2005				Phase II, 1990-2005
	25-Year		15-Year		15-Year
	C+CB	CBA	C+CB	CBA	CBA
Failure Rate	14.0%	3.6%	10.8%	2.9%	1.0%
Units	917	797	1,025	1,018	10,944



In some applications water was captured in the airspace. In these cases, when the water freezes in the winter there is a high probability of glass fracture due to the water expanding.

Margaret Webb, CHRP, is the executive director of the Insulating Glass Manufacturers Alliance in Ottawa, Ontario. Additional information about the organization can be found online at www.igmaonline.org.

Projects

Glass Pool Walls See Increasing Popularity in Australia

Glass and glazing trends vary from country to country. In Europe, for example, double-glazed facades are quite common, while in Australia, glass railings and balustrades can be seen on many homes, condos and hotel projects. In addition to balcony and patio railings, glass walls surrounding pools are also growing in popularity in Australia.

"[Large-scale], frameless, glass pool walls are at the top end of the affordability scale," said Vince Bianchini with Cooling Brothers,

an Australian glass company located in High Wycombe, Western Australia. "There is an increasing trend for glass pool windows, which our company engineers, supplies and installs on a regular basis."

In one recent project, Cooling Brothers manufactured, supplied and installed the stainless steel channel and tempered laminated glass, constructed with DuPont's SentryGlass Plus, for the glass pool wall at Tower 4 Burswood Complex located in Burswood, Western Australia.



Glass pool walls, such as the one installed at the Tower 4 Burswood Complex in Western Australia, are becoming popular design features.



Bianchini explained that Cooling Brothers was invited onto the project by the Mirvac Pty Ltd., the project builder.

“The original design concept had very large, stainless steel, up-right support posts in between each panel of glass,” he said. “Due to a previous domestic pool wall job spanning 16 meters long, which our company had completed 18 months prior, we were able to offer a truly frameless glass pool wall, which was the original [design] intent.”

Bianchini adds that they worked with Bill Smalley from Scott Smalley Partnership as its engineering consultant. Together the team re-designed and engineered the frameless glass wall.

The project incorporates four panels approximately 2,000 mm high by 2,500 mm

long constructed of 32-mm tempered, laminated glass with polished edges.

“Due to the weight of the glass panels weighing in excess of 450 kg (approximately 992 pounds) logistics of lifting, crainage and glazing were factors we had to overcome,” Bianchini said, who added that the work was completed in stages.

“The stainless steel channel was cast into the concrete shell of the pool. Following this the glazing occurred several months later, followed by the waterproofing and silicone seal required,” he said.

Cooling Brothers says it helped achieve the goal of the project, which was to provide the swimming pool area with an uninterrupted glass wall that would serve as the focal point for the development’s entry. **AG**

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New Product Focus



glass Open the "Sungate"

As a way to help commercial buildings in heating-dominated climates retain heat from the sun and reduce winter heating costs, Pittsburgh-based PPG Industries introduced Sungate

400 glass, a passive low-E glass with a magnetron sputtered vacuum deposition soft coat. The company says the new glass has a winter U-value (insulating value) that is 9 percent better than that of Sungate 500 glass, a passive low-E coated glass manufactured with hard, pyrolytic coatings.

In addition to its insulating qualities, Sungate 400 glass has a clear aesthetic. The company says when coated on a conventional clear glass substrate, visible light transmittance (VLT) for Sungate 400 glass is 76 percent; on a Starphire glass substrate, VLT is 80 percent.

According to the company, Sungate 400 glass is ideal for use as a passive low-E product when specified as a third-surface coating on Starphire glass. Sungate 400 was engineered to be paired

continued on page 12

hardware

Closing in on New Systems

The Aluflex 40 is the newest addition to Häfele America Co.'s sliding hardware systems. This new bottom rolling hardware system is designed for use in interior spaces and allows large, made-to-order aluminum frame sliding doors to be installed to a ceiling height of up to 8 feet by 2 inches. It can be accessorized with different decorative glass designs or with different translucent materials to meet specific space requirements.

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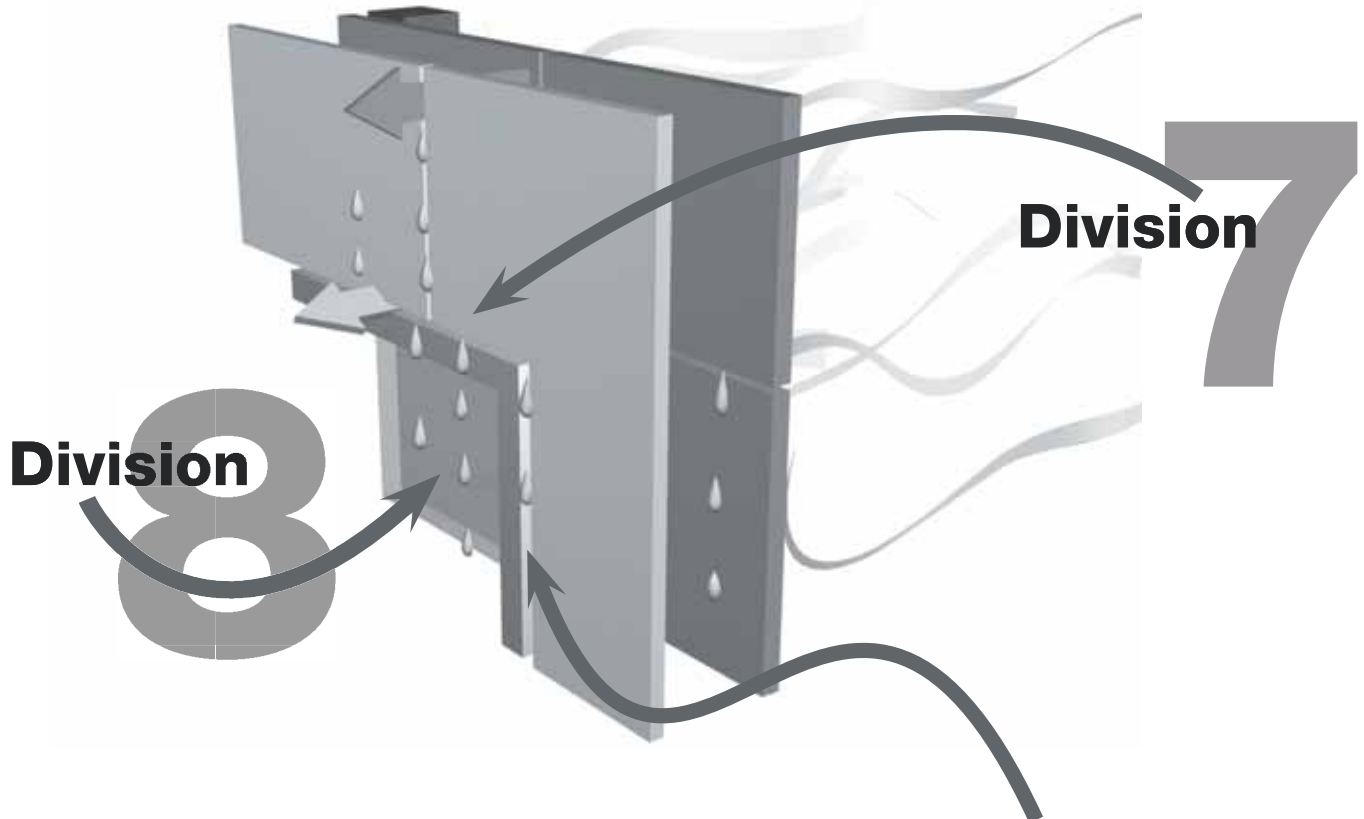
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- Most manufacturers won't warrant the connection of their sealant to flashings and air barrier membranes.
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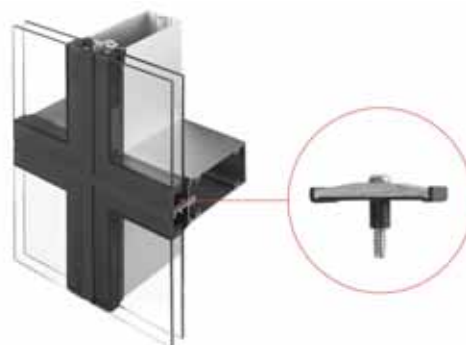
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storefront and curtainwall Clear Connections

To meet what it says is a growing demand for a monolithic look for low-rise applications, Kawneer Company Inc. has introduced Clearwall™ curtainwall, which features a four-sided toggle glazed system with a glass retaining mechanism. The company says the Clearwall curtainwall is a cost-effective alternative to four-sided systems and its unique toggle mechanism reduces installation labor, simplifies onsite logistics and enhances safety while providing a high level of aesthetics.

The new system was developed specifically with low-rise commercial and institutional building applications in mind. The system's effectiveness comes from the combination of the toggle system with a recessed glass edge spacer insulating glass unit. The toggle mechanically captures the inboard



lite of the insulating glass unit and rotates in place automatically locking when the fastener is installed. Each toggle captures an edge of adjacent glass lites, increasing the efficiency of installation.

Clearwall curtainwall also features two mullion depths allowing for increased design flexibility based on performance requirements. It has been tested in accordance with North American performance standards, including seismic, thermal cycling, cyclic water and severe wind-driven rain resistance. Kawneer's range of anodized and painted finishes is available for Clearwall curtainwall, which is also offered in two other glazing options. Each option accommodates 1-inch insulating glass and uses the toggle system. The additional options incorporate an attached interface to the glass with structural silicone or 3MTM VHB™2 structural glazing tape.

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