

Architects' Guide™ TO GLASS & METAL

Volume 27 • Issue 3

May/June 2013

From the Outside In: Interior Glazing Trends

Also Inside:

- Get Ready for AIA 2013
- Keeping Schools Safe—With Glass
- Spotlight on Glass Stairs
- And More!

Visit **Booth 1650** at the AIA Convention to see our latest technologies for high-performance buildings – June 20-22, Colorado Convention Center

Next-Generation Curtainwall with High Performance Insulation

In a time of stricter energy codes, when the energy performance of buildings is key, the challenge is to empower designers to deliver high-quality architecture with low environmental impact.

Dow Corning® Architectural Insulation Modules combine the aesthetics and convenience of curtainwall construction with the added energy-saving benefits of high-performance *Dow Corning®* Vacuum Insulation Panels. This high-efficiency insulation meets the highest energy requirements while also maintaining design freedom and aesthetic appeal.

Another recent innovation – the *Dow Corning®* brand Silicone Air Barrier System – is a complete air and weather barrier solution that provides airtight moisture control for more energy-efficient designs.

These robust technologies not only improve building energy efficiency. They also offer new design options.

To learn more about our High Performance Insulation solutions, visit dowcorning.com/HPIInsulation.



PERFORMANCE UNDER PRESSURE

INTRODUCING 1630 SS IR CURTAIN WALL – ELITE IMPACT RESISTANCE FROM KAWNEER

High Performance. Larger Spans. Increased Impact Resistance. Kawneer's new 1630 SS IR Curtain Wall – an impact resistant 3" sightline curtain wall system – offers an additional line of defense against high winds, heavy rains and hurricanes. Having undergone rigorous testing, our new curtain wall meets increasing design pressure requirements in impact zones and can deliver larger spans. And, screw-spline architecture with both dry and wet glazing options makes the 1630 SS IR easy and fast to install. Kawneer knows how to protect buildings and occupants. **1630 SS IR Curtain Wall is performance under pressure.**

Architectural Aluminum Systems
Entrances + Framing
Curtain Walls
Windows
kawneer.com



SEE US AT THE AIA CONVENTION

Volume 27,
Issue 3,
May/June 2013

Architects' Guide TO GLASS & METAL

CONTENTS

No Boundaries

18

Interior glass is being used even more frequently for more practical purposes in architecture, such as in health care facilities, or to bring the outdoors in and foster an increased sense of natural light in academia and hospitality facilities.

The Green Mile

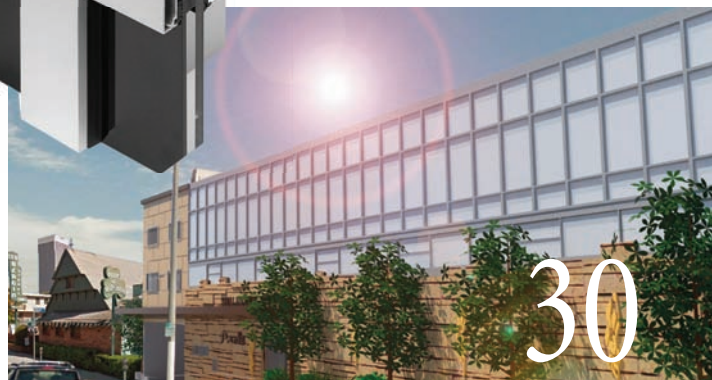
24

The AIA National Convention is headed to Denver, one of the greenest cities in the nation. Here's a look at some of the eco-minded products exhibitors plan to display.

A Time to Learn

30

After the shootings in Newtown, Conn., questions were raised about the use of glass in schools and safety—can schools be filled with natural light and still be secure?



Columns and Departments

- 4 FROM THE EDITOR
- 6 GLASS TECH
- 12 PROJECTS
- 14 NEW PRODUCTS FOCUS
- 34 EDUCATION & RESOURCES
- 35 INDUSTRY EVENTS
- 36 AIA CONTINUING EDUCATION



On the Cover

Glass is a hot item when it comes to interior glazing, such as in the UC Berkeley School of Law-Southern Addition designed by Ratcliff.

Turn to page 18 to learn more. Photo courtesy of Ratcliff
©2012 Tim Griffith/
www.timgriffith.com.

©2013 by Key Communications Inc. All rights reserved. *The Architects' Guide to Glass and Metal* is published bi-monthly by Key Communications Inc., 385 Garrisonville Road, Suite 116, Stafford, VA 22554; 540/720-5584; fax 540/720-5687. Advertising offices listed one page 4. Unsolicited manuscripts and other materials will not be returned unless accompanied by a self-addressed, stamped envelope. All contents are ©2013 by Key Communications Inc. Neither publisher nor its representatives nor its subcontractors assume liability for errors in text, charts, advertisements, etc. and suggest appropriate companies be contacted before specifications or use of products advertised or included in editorial materials. Views and opinions expressed by authors are not necessarily those of the publisher. For permission to reprint, contact editorial office. Printed in the U.S. No reproduction permitted without expressed written permission of the publisher. Questions? Call 540/720-5584. Send subscription inquiries to Key Communications Inc., P.O. Box 569, Garrisonville, VA 22463.

It takes a special kind of glass to make the Glasshouse.

Artist Dale Chihuly is known for the color of his glass. That's why Owen Richards Architects specified Guardian SunGuard SuperNeutral 62 on clear for the Glasshouse, the centerpiece of the *Chihuly Garden and Glass* exhibition in Seattle. With a visible light transmission of 62%, SN 62 allows the beauty of Chihuly's artwork to be seen from the outside. And with a solar heat gain coefficient of 0.31, it meets the City of Seattle's tough energy requirements as well. For complete performance data and other ways to Build With Light, visit SunGuardGlass.com. Or call 1-866-GuardSG (482-7374).

**GUARDIAN
SUNGUARD®**
ADVANCED ARCHITECTURAL GLASS

BUILD WITH LIGHT®

SEE US AT AIA BOOTH #1916

GLASSHOUSE, CHIHULY GARDEN AND GLASS,
SEATTLE, WA

ARCHITECT: Owen Richards Architects

GUARDIAN SELECT™ FABRICATOR:
Hartung Glass Industries

GLAZIERS: Novum Structures
and Eastside Glass
(Guardian Glazier
Connection™ Member)

SUNGUARD GLASS:
SuperNeutral 62
on clear



Build With Light® and Guardian Select™ are registered trademarks of Guardian Industries Corp.

Please order glass samples for accurate color evaluation.

Artwork ©2012 Chihuly Studio. All rights reserved.
Photo by Ben Benschneider.



From the Editor

The Future's So Bright

If studies hold true, taking advantage of natural light in architecture is ideal not only for improving comfort levels and energy savings, but also improving occupant performance and productivity. Research on natural light in schools, for instance, suggests children learn faster and do better on standardized tests in classrooms with more daylight. Reports also have indicated that learning rates go up in day-lit classrooms. So, if children are indeed the future, and natural light can enhance their learning abilities, why would we, as a society, not take every possible effort to ensure their success?

The shootings last December in Newtown, Conn., were devastating. Since that time many jurisdictions and school boards have raised concern over the safety levels of schools throughout the country. For some, the question to answer has been this: should glass and windows simply be removed from schools? For some, that's not an easy one to answer.

Limiting, reducing or eliminating glass usage in schools—not necessarily for the better—could absolutely change the way by which schools are designed and built today. My high school was nearly windowless. Over the years, however, as glass and glass technologies have evolved, so, too, has the way architects design schools. Many newly-constructed schools around the country take full advantage of glass. And just because glass is a significant building material it absolutely does not mean the schools will be any less safe had they been constructed predominantly of brick and mortar. Those advancing glazing technologies have also brought stronger glass and window products; safety films are available; hardware systems, too, have evolved. Yes, you can have glass, natural light and beautiful aesthetics while still providing a safe, productive environment.

This is a topic the architectural industry cannot ignore; I expect to see more and more discussions raised. Turn to page 30 to read an in-depth look at what the future could hold for school designs. You can also visit our sister publication USGlass online at www.usglassmag.com and see the May issue, which was dedicated entirely to school safety. **AGG**



Ellen Rogers

Ellen Rogers

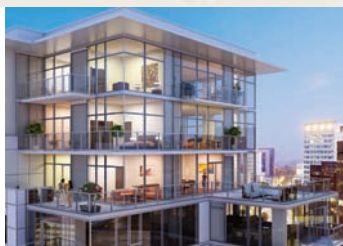
Architects' Guide TO GLASS & METAL

Editor	Ellen Rogers Extension 118 • erogers@glass.com
Contributing Editors	Tara Taffera Extension 113 • taffera@glass.com
Assistant Editor	Casey Neeley Extension 120 • cneeley@glass.com
Special Projects Editor	Megan Headley Extension 114 • mheadley@glass.com
Managing Editor	Dawn Campbell Extension 150 • dcampbell@glass.com
Graphic Artists	Ashley Weaver Extension 132 • aweaver@glass.com
Advertising Coordinator	Nickie Lively Extension 131 • nlively@glass.com
Events Manager	Tina Czar Extension 115 • tczar@glass.com
Marketing Director	Holly Biller Extension 123 • hbiller@glass.com
Customer Relations Mgr.	Janeen Mulligan Extension 112 • jmulligan@glass.com
Web Developer	Bryan Hovey Extension 125 • bhovey@glass.com
Video Producer	Chris Bunn Extension 121 • cbunn@glass.com
Customer Service Assistant	Erin Harris Extension 0 • eharris@glass.com
Publisher	Debra A. Levy Extension 111 • deb@glass.com Published by Key Communications Inc. P.O. Box 569 Garrisonville, VA 22463 USA 540/720-5584; fax 540/720-5687
Advertising Offices:	
Midwest	Lisa Naugle Associate Publisher lnaugle@glass.com 312/850-0899 Fax 312/277-2912
Northeast & Eastern Canada	Contact Publisher Directly Debra A. Levy deb@glass.com 540/720-5584 x 111 Fax 540/720-5687
Southeast	Scott Rickles srickles@glass.com 770/664-4567 Fax 770/740-1399
West Coast & Western Canada	Josh Lentz jlentz@glass.com 206/283-6762 Fax 888/786-8777
Europe	Patrick Connolly patco@glass.com 99 Kings Road, Westcliff on Sea Essex SS0 8PH ENGLAND (44) 1-702-477341 Fax (44) 1-702-477559
China & Asia	Sean Xiao sxiao@glass.com Rm.403, Block 17, Wuyimingzhu, No.6 Jinshan Road, Fuzhou, Fujian, 350001, China. (86) 591 83863000

All Others Contact Publisher Directly

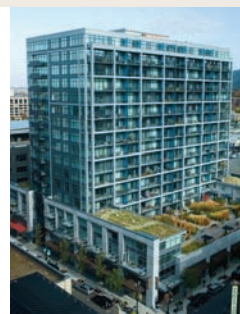
Debra A. Levy
Extension 111 • deb@glass.com





sapa:

Shaping the future



We call it Aluminology...

YOU'LL CALL IT the most technologically advanced process for customer-focused solutions in extruded aluminum.

Sapa innovation turns visions into leading commercial building and construction products with advanced engineering, technical competencies and unprecedented resources.

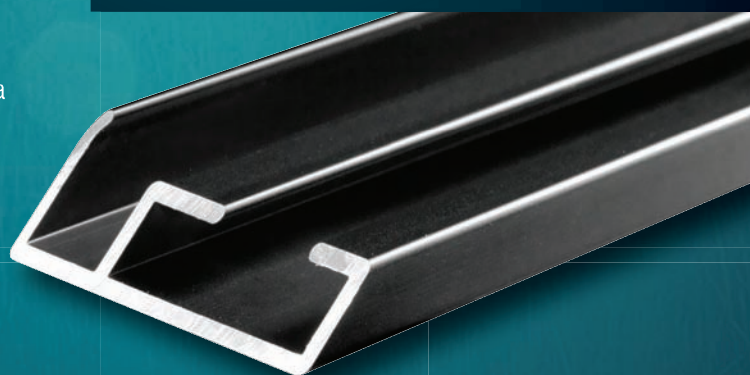
- Operations in 30 countries / 16 plants in North America
- Unmatched capacity and product capabilities
- World class technical and design assistance
- Service and integrated logistics focused on you

Profiles Engineered for Your Success

From window and door framing systems and components, to storefront systems and curtainwall components Sapa **ALUMINOLOGYSM** means finding answers to today's toughest design challenges.

MAKING THE CASE

- ✓ Aluminum is highly sustainable and supports LEED credits
- ✓ Aluminum is 100% recyclable with high scrap value
- ✓ Aluminum can be repeatedly recycled, retaining the same physical properties
- ✓ Nearly 75% of all aluminum ever produced is still in use today



Sapa Extrusions North America

877-710-7272 | www.sapagroup.com/NA
NorthAmerica.Sales@sapagroup.com

Glass Tech

Unconventional Concepts

Rails, Stairs and Floors Offer Intriguing Designs

by Ashley M. Charest

The number one question we receive at the Glass Association of North America (GANA) is not directly about design, but instead is about mechanics. “What is the weight of glass?” The answer is “it depends” but one sample would be approximately 6.4 lb/ft² (31.2 kg/m²) for half-inch glass. That being said, the more intriguing questions we receive are about how our members’ products can be used in “unconventional” ways.

Floors, rails and stairs typically are thought of as wood and metal products, and historically that assumption is correct. However, more and more individuals in the design community are making glass a “typical” choice when they are designing these three building features. With these features becoming increasingly more common, we have created a series of bulletins on the subjects, along with a variety of others.

The text below is an excerpt taken from a recently updated document, *LD 06-0413 Glass Floors and Stairs*.

Choosing the Glazing

Several types of glass products are used in floors and stair treads, including laminated glass and glass block systems. A description of these glass types follows:

Laminated glass - two or more pieces of glass bonded together with an interlayer.

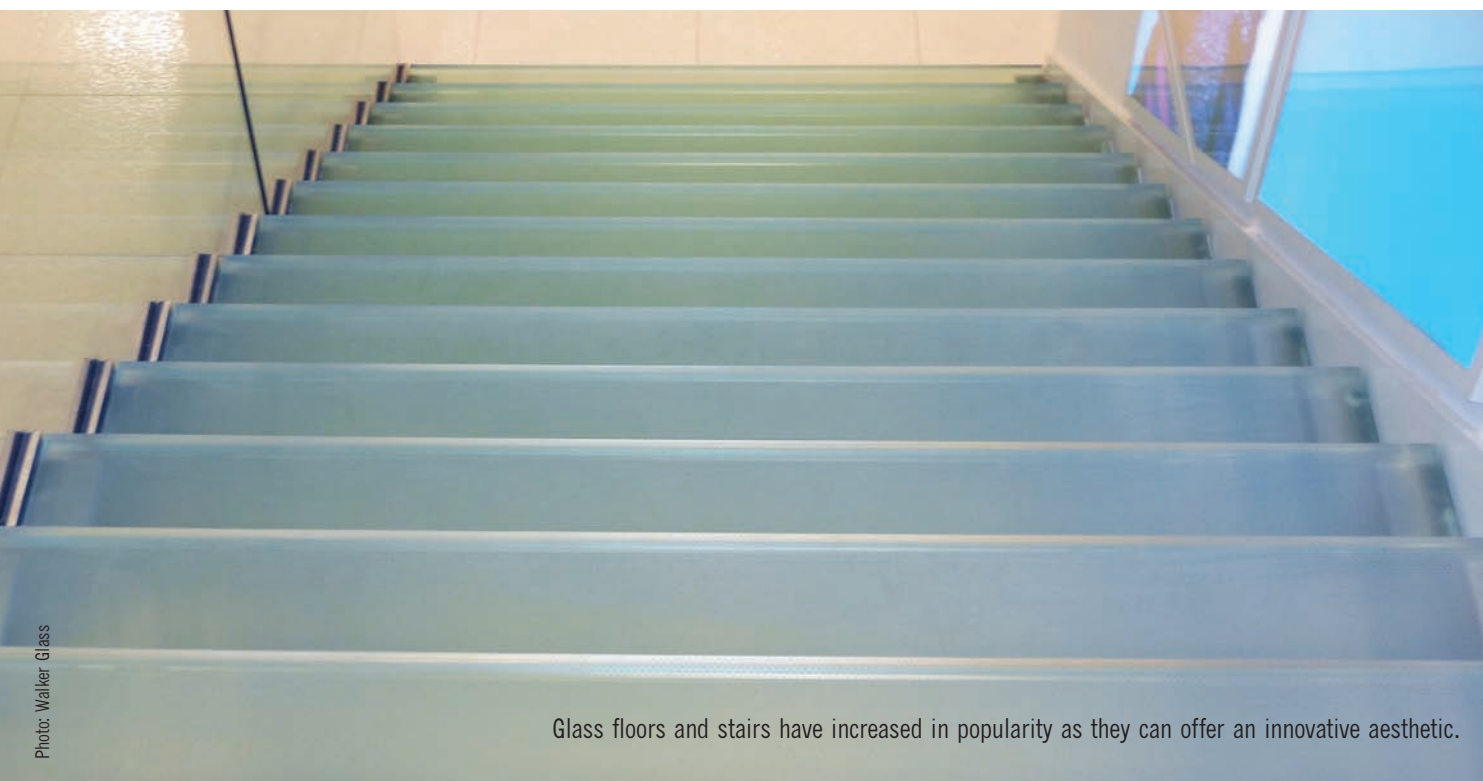
The glass may be annealed, heat- or chemically-strengthened or fully tempered.

Glass block - a decorative hollow glass building block that is set in an aluminum or concrete framework and sealed against moisture.

Providing Slip Resistance

Slip resistance of a walking surface is an important safety consideration. The Occupational Safety and Health Administration (OSHA) requires a minimum slip resistance, expressed as a static coefficient of friction of 0.50. However, special activities, such as dancing, may require a different level

continued on page 8



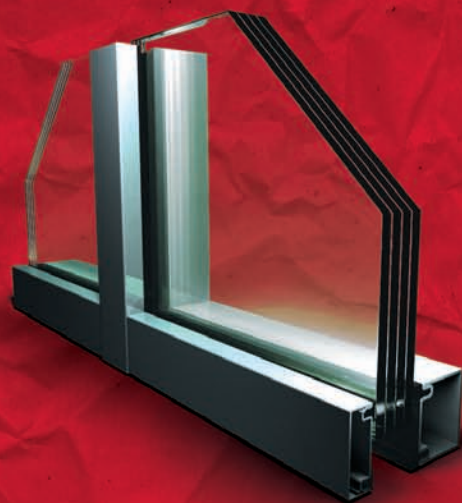
Glass floors and stairs have increased in popularity as they can offer an innovative aesthetic.

Project: E80th Street Townhouse

Location: New York, NY

Architect: Toshiko Mori Architects

Product: Fireframes® Curtainwall Series and
Pilkington Pyrostop® glass firewall



ART CAN BE ON THE WALL OR IT CAN BE THE WALL.

A building can work to protect, while still being a work of art. Frame your masterpiece with our Fireframes® Curtainwall Series. The narrow steel profile allows for large expanses of glass in interior and exterior applications. The system is also available in stainless steel or can feature aluminum cover caps to complement your design. Check out the complete Fireframes family of products for options from fire-rated silicone glazed curtainwall systems to glass floor systems.

fireframes



fireglass.com | 800.426.0279

TGP



FIRE RATED
one source. many solutions.®

Glass Tech

“More and more individuals in the design community are making glass a ‘typical’ choice when designing these three building features.”

of slip resistance. Glass floors used near entrances that may get wet require special consideration.

There are a variety of ASTM test methods that measure slip resistance using specific test equipment under dry or wet conditions. These are:

- F 609 - Standard Test Method for Static Slip Resistance of Footwear, Sole, Heel, or Related Materials by Horizontal Pull Slipmeter (HPS);
- F 1677 - Standard Test Method for Using a Portable Inclined Articulated Strut Tester (PIAST);
- F 1679 - Standard Test Method for Using a Variable Incidence Tribometer (VIT); and
- D 2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.

Other industry standards, such as ASTM F 1637 - Standard Practice for Safe Walking Surfaces, ASTM F 1646 - Standard Terminology Relating to Safety and Traction for Footwear and Underwriters Laboratory (UL) UL 410 - Slip Resistance of Floor Surface Materials, address the safety issues of walkway surfaces from a more general point of view.

Processes designed to roughen the top surface of the glass to provide slip resistance include sandblasting, acid-etching, ceramic frit and embossing. It is important to note that sandblasting may reduce the strength of the glass by as much as 50 percent; therefore, glass flooring should never be sandblasted in the field without a complete engineering analysis.

Considering Modesty

Modesty becomes an issue when glass floors are found on upper levels and inappropriate lines of sight are created from spaces below. It may be necessary to incorporate a decorated or translucent interlayer in the glass.

Testing

Glass floors can be tested for strength or impact resistance. Test methods that are used include:

- ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction;
- ASTM E 695 - Standard Method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading; and
- ASTM E 2322 - Standard Test Method for

Conducting Traverse and Concentrated Tests on Panels Used in Floor and Roof Construction.

Below is an excerpt from LD 09-0513 Use of Laminated Glass in Glass Railing Systems.

Building Code Requirements

Chapter 24 of the International Building Code (IBC) addresses glass used in handrails and guards. It states that glass used as a handrail assembly or guard section is to be a minimum thickness of 1/4 inch (6 mm) monolithic tempered glass, laminated tempered glass or laminated heat strengthened glass. Glazing in railing in-fill panels is required to conform to Category II impact requirements of the Consumer Product Safety Commission (CPSC) 16 CFR 1201 or Class A of ANSI Z97.1.

Two new provisions were added to the 2009 IBC. The first is an exception to the requirement of a minimum of three glass balusters supporting each handrail or guard section. The code requires attached handrails or guards, except where the glass balusters are laminated with two or more glass plies of equal thickness and the same glass type when approved by the building official.

The second provision addresses glass installed in exterior railing in-fill panels or balusters in wind-borne debris regions. It says the glass is to be laminated glass complying with safety glazing impact requirements. When the top rail is supported by glass, large or small impact testing is required.

Glass Railing Standards

Glass railing system testing is done according to ASTM E 2353-06 Standard Test Methods for Performance of Glass in Permanent Glass Railing Systems, Guards & Balustrades. The standard evaluates static strength, impact resistance and post-break retention. Railing systems are specified according to ASTM E 2358-04, Standard Specification for the Performance of Glass in Permanent Glass Railing Systems, Guards, and Balustrades. These systems include glazing infill, as well as structural glass railing types. **AGG**

Ashley M. Charest is the account executive for the Glass Association of North America in Topeka, Kan.



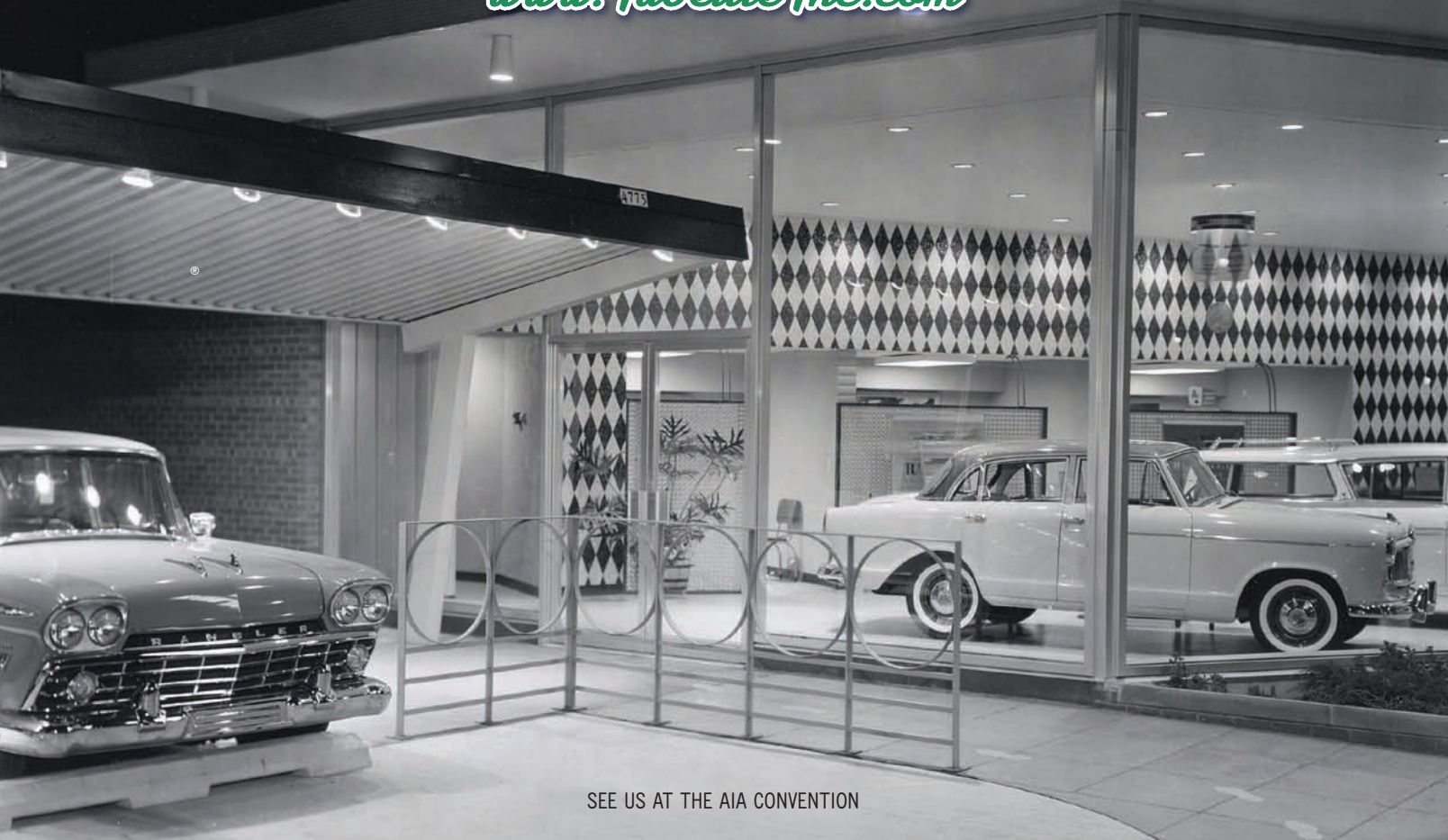
Your *Dependable* supplier of commercial
aluminum building products since 1945

TUBELITE®

DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS

www.TubeliteInc.com



SEE US AT THE AIA CONVENTION



FROM **PROJECT PLANNING** TO **INSTALLATION**

YOUR ONE CALL SOLUTION TO ANY WINDOW FILM PROJECT



WHY CHOOSE AEGIS?

Aegis specializes in innovative techniques and solutions for any window film project. We manufacture, install, and warranty all types of film from safety and security products, decorative and custom patterns to all varieties of sun control and privacy films. We can also manufacture custom products for your project to ensure your vision becomes a reality.



Our Turn-Key program offers a full range of services from consultation through installation. Aegis partners with architects, project managers, and glass shops to complete each project on time, on spec, and on budget. We can provide materials, labor, insurance, and equipment for every project. After completion, you will have the comfort of knowing that your warranty is backed directly by the manufacturer.



PREMIUM AMERICAN MADE FILMS

AEGIS FILMS PROVIDES:

- Consultation/Installation
- Anti-Graffiti Films
- Decorative and Privacy Films
- GSA Approved Security Films
- Sun Control/Hot Spot Elimination
- Glare Control
- Custom Manufactured Products Available

**Your one call solution to
any window film project.**

CALL US TODAY

1-800-438-8468

WWW.AEGISFILMS.COM

Projects

Fashion Forward: Glass Stairs Make a Stylish Statement

Located in Calgary, Alberta, the Le Chateau clothing store features a stylish interior that includes acid-etch glass stair treads, which incorporate an anti-slip texture.



Never were the words “watch your step” more true than they are today. The increasing options for glass walking surfaces have allowed architects and designers to bring the sleek look of glass, so fashionable on the walls, to the floors below. Such is the case for the Le Chateau clothing store in Calgary, Alberta, Canada, which opened in 2012. There, not only are the latest looks all around, but the store’s entire aesthetic is in season with its glassy staircase one of





The acid-etch, anti-slip glass used in the Le Chateau was supplied by Walker Glass, fabricated by Accura Glass Bending and installed by EeStairs.

the main attention-grabbers. The Le Chateau worked with its own in-house architect on the design, which was ultimately installed by glazing contractor EeStairs headquartered in Brantford, Ontario, which worked closely with the design team.

"In terms of the project we provided them with several services starting with an initial rendering where we re-designed the staircase," says Nathan Koppelaar, creative director for EeStairs. "We then worked with RJC Consulting Engineers to engineer the staircase and all the glass. After this we fabricated the stainless steel stringers, and the stainless railing track. We also worked with Accura Glass Bending in Toronto, who laminated and tempered the glass treads with a non-slip/privacy surface finish by Walker Glass."

Koppelaar says the major challenge with this project was timing.

"We had eight weeks from approved drawings to completion, so it was a major push, but we were able to complete this three days prior to the grand opening of the store," he says. "The main challenge in terms of the glass was finding a product that could provide both a rated non-slip surface and a privacy factor. This was achieved using the Walker products."

The top layer of the tread incorporates acid-etched glass pattern 406 from the Walker Textures Traction product line. The 406 acid-etched pattern is designed to provide a high slip-resistant coefficient based on two test methods: ANSI/NFSA B101.1 "Test

Method for Measuring wet SCOF of Common Hard-Surface Floor Materials," and ASTM C1028 "Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method."

The composition of each stair is three layers of 10-mm clear glass, heat-strengthened laminated with a .015 interlayer. Walker Glass supplied about 200 square feet of 10-mm clear glass with the 406 acid-etched pattern, which was used as the walking surface.

Brian Medinski, owner of Accura Glass, says his company frequently does stair tread projects, but this was the first time they had worked with this particular Walker product, which was introduced in 2011.

"On this particular project we got started on it [soon] after Walker introduced this anti-slip texture on heavy glass," says Medinski. "We also do a lot of work with EeStairs, a lot of staircase projects, and have done a variety of stair tread applications for them over the years. They are very professional and the information [they provide us] is always 100 percent."

When it comes to glass designs for walking surfaces, though, there are many considerations to keep in mind. According to Walker, some important features when using acid-etched glass in a flooring application include the ability to combine discretion and security without impeding the natural flow of light. **AGG**

let us
LEED®
you green

- Polysulphide - "The Proven Performer"
- Proven to provide the best field performance when used in a dual sealed IG System
- Fenzi Thiover polysulphide contains no solvents or other hazardous ingredients
- Fenzi HOTVER 2000 Hot Melt Butyl, solvent free
- Excellent mechanical properties, including low permeation of water and gases
- Compatible with all spacer systems and most glazing materials
- "For your next job, specify Fenzi"

**HERE TODAY,
HERE TOMORROW,
TO SERVE YOUR NEEDS**

For Architects Online AIA accredited course, please visit www.fenzi-na.com/architects-education.html



tel: 416-674-3831 fax: 416-674-9323
www.fenzi-na.com

New Product Focus

glass

The Blue + Grey Together

Pilkington North America announced the development of graphite blue, a light blue-grey tint that joins its Optifloat family of tinted glass. The new body-tinted solar control glass offers high daylight transmittance with a soft, blue-grey tone, according to the company.

The new graphite blue tint offers flexibility for original and innovative architectural designs where low reflection is required. It is also suitable for commercial applications requiring solar control. To achieve additional thermal insulation, the new tinted glass can be combined with the company's Energy Advantage low-E glass in an insulating glass unit.

Pilkington Optifloat graphite blue is available in 6mm, 8mm and 10mm thicknesses. The substrate is also available with the company's Solar-E Plus solar control pyrolytic coating.

→ www.pilkington.com/na



safety and security

Glazing Can Help Schools Play it Safe

Kuraray Trosifol says it has a glazing solution for school systems seeking to enhance safety and security that, according to the company, is not only cost effective, but also may help save the lives of children. Trosifol is a PVB glass film that can enhance the characteristics of glass. According to the company, the product transforms standard and tempered glass from something that would shatter to a shield against intruders without detracting from the clarity of the glass or adding yellowness.

"It always is great when we find our product to be able to provide safety in the event that the unexpected happens," says Christian Amad, director of Trosifol. "We saw what Trosifol's benefits were to the automotive glass industry and thought we could make this apply to life-threatening situations, such as an intruder."

While costs may be a barrier for some schools, structural security improvements are now eligible for many state construction grants. According to Trosifol, organizations such as the Department of Homeland Security offer grants to public schools, in addition to smaller programs earmarked to assist at-risk, non-profit organizations in general, as well as those within especially sensitive urban cores.

→ www.kuraray.com

spacers

Chrome Piece

Fenzi North America has released its Chromatech and Chromatech Ultra stainless steel spacers. The warmedge spacers are available with corner keys and connectors.

The Chromatech line also offers better sightline temperatures in excess of 17 percent compared to traditional aluminum, according to the company. The stainless spacers are available in a wide range of air-space widths, have a polycarbonate bridge across the top and are available in three colors.

→ www.fenzi-na.com

continued on page 16

Guam



Storefront

Hawaii



Max' Sliders



Vegas



Herculite/Sandblast

Canada NY Florida



Egress Hardware/
Full Frame Doors

Cabo Mexico



Movable Glass Wall



Curtainwall

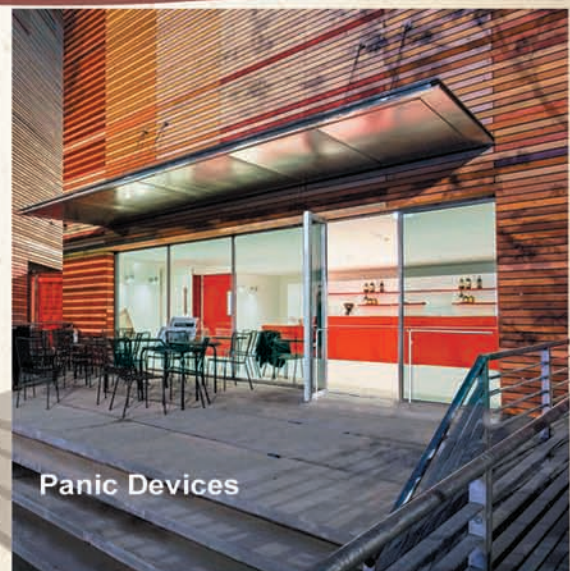
Baja Mexico

If time is
of the essence,
our **NEW**
expedite
program
is the answer.



•Crate/Freight
available
to any part of
the U.S. / International
* consult PRL for details

For Estimates & Orders:
ph (877) 775-2586



Panic Devices

Europe



PRL

**GLASS
SYSTEMS**
www.prlglass.com

Aluminum
ARCHITECTURAL PRODUCTS
www.prlaluminum.com

Complete Glazing Solutions
**Goes
International**

New Product Focus

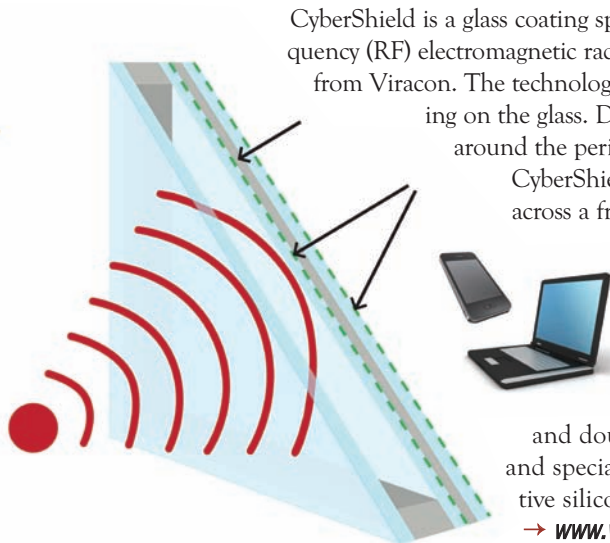
Viracon Debuts RF Solutions

CyberShield is a glass coating specifically engineered to reduce the transmission of radio frequency (RF) electromagnetic radiation. This RF shielding is one of the newest developments from Viracon. The technology's made possible by the use of the Pilkington Datastop coating on the glass. Datastop is conductively connected to the window frame around the perimeter of the window to ensure maximum effectiveness.

CyberShield offers electrical attenuation with an average of 45 decibels across a frequency range from 35 megahertz to 18 gigahertz, while optimizing visible light transmission with a neutral glass color. Additionally, glass performance can be enhanced with low-E coatings and/or silk-screen solutions.

CyberShield glass can be used as a glazing solution for exterior or interior walls where RF shielding is needed. Available in laminated, insulating laminated and double laminated insulating glass, it requires heat-treating and special glazing requirements of a conductive gasket or conductive silicone to maximize performance.

→ www.viracon.com AGG



www.e-bentglass.com

One piece or thousands, our custom fabricated BENT GLASS is bringing form and function to the designs of tomorrow.



**Architectural, Interior, Solar
& Transport Applications**



Precision Glass Bending

THE WORLD LEADER IN
CUSTOM FABRICATED
BENT GLASS

Precision Glass Bending Corporation
PO Box 1970, 3811 Hwy 10 West
Greenwood, AR 72936-1970
UNITED STATES OF AMERICA

TEL (800) 543-8796 • FAX (800) 543-8798 • sales@e-bentglass.com

GUARDIAN
SELECT FABRICATOR
Guardian SunGuard Select™ Fabricator

DS
SolidWorks

DS
CATIA

AutoCAD®



WHEREVER THERE IS GLASS WE CAN *improve* IT.

Madico Architectural Window Films

- Block up to 80% of the sun's heat and reduce glare
- Protect interiors against fading
- Increase safety and security
- Are available in many shades and colors
- Are backed by a strong manufacturer's warranty
- Enhance the appearance of any home or business

Professionally Installed

Madico Window Films are composed of thin layers of metallized and dyed, optically clear polyester laminated with special adhesives and protected by a durable, scratch-resistant coating. The film is generally installed to the inside of windows and doors, offering immediate protection from the harmful and uncomfortable effects of the sun.

Your local Madico dealer is a professional qualified to help you select the right film for your client's home or business.

Improved Aesthetics • Energy Savings • Increased Comfort • Security • UV Protection



Photo: ©2012 Steve Whittaker/ whitphoto.com

NO BOUNDARIES

Interior Glass Is Set to Play an Ever-Growing Role in Architecture

by Jenna Reed

In a learning institution you're creating building blocks that will set the future in motion, where you can not only see what is in front of you, but what lies beyond the walls, and when you look up you see pockets of blue sky. Imagine a place where glass plays a subtle yet vital role in the architecture and drives the learning experience.

Glass was infused throughout the layout of the Berkeley Law School addition in the form of skylights, walking planks and even transparent/semi-transparent wall systems that allow light to filter into two below grade levels.

And the use of glass in interior architecture goes further. At Villanova's Falvey Library, a glass partition system takes center stage to offer a visual connection to a nearby tutoring and conference space. And in the Seidman University Hospitals Cancer Center in Cleveland, Ohio, glass takes on a

more practical purpose since it is much more difficult for germs to survive on its non-porous surface.

The use of interior glass in architecture can help bring the outdoors inside as well as increase the spread of natural light throughout a building, which can help bolster social interaction.

"The primary benefit in our work [in interior glass] is the extended connections to shared daylight," says Michael L. Prifiti, FAIA, of Philadelphia-based BLT Architects. "Beyond the glazed walls, we are more frequently including transom or sidelites in office construction."

Sherman C. Aronson, AIA, LEED AP, also of BLT Architects, adds, "Glass has so many facets—the design can exploit its transparency, so that there is both an image or color, and the ability to see through to borrow daylight and to create interior effects. Through the use of translucency, we



Left and above: Ratcliff used glass when working on the addition at UC Berkeley Law School to create visual interest and social interaction.

Photo: ©2012 Steve Whittaker / whitpho.com

can obscure vision to areas that are more private, while allowing a sense of connection and perception of lighting.

"It may also provide an opaque finish on a wall, counter or interior finished facing material," he continues. "And the use of textured glass, with a three-dimensional surface, adds activity and life to the situation and catches light in a variety of ways."

Meanwhile, Joseph Nicola, associate principal and director of academic practice at Ratcliff in Emeryville, Calif., says the use of interior glass can help lend an atmosphere of social interaction.

"At the UC Berkeley Law School project, we were able to foster social interaction, enhance the quality of the surroundings, unifying the indoor and outdoor elements, while strengthening connections with the surrounding courtyards and campus," says Nicola. "Interior glass enabled exciting views between the new addition and the existing building's classrooms, creating visual interest and cohesion to students' experiences."

Also extolling the benefits of interior glass in architecture are officials with Paulsboro, N.J.-based McGrory Glass, a flat glass fabricator and consultant to the architectural glass industry.

"Glass provides unlimited options in colors and patterns, encases beauty and visibility, and contributes to the aesthetic disposition of the environment," says Gary McGrory, vice president of McGrory Glass. "Warm colors and subdued tones set a mood for business in a more consultative and creative architecture, whereas bright, bold shades in health care settings can help build a positive attitude and sense of well-being," he adds.

Projects Turning to Interior Glass

There are numerous options for incorporating interior glazing into projects. For instance, at Villanova's Falvey Library BLT used the DIRRT glass partition system in a renovation of an entire floor into a new learning commons, according to Kevin W. Aires, AIA, LEED, BD + C of BLT Architects. DIRRT is a company that makes demountable glass partition wall systems.

"A central 'street' concept was developed with floor-to-ceiling glazed partitions along both sides of an entire lounge corridor providing visual connection to adjacent tutoring services and conference spaces," says Aires. "This has created a stronger community among the different programs located in the learning commons and enlivens the whole facility."

The company also utilized interior glazing at Revel Resort in all the office administration areas.

"With the use of film, we were able to create a sense of an open office, yet still maintain privacy within," adds David M. Smallets, AIA, LEED AP, of BLT.

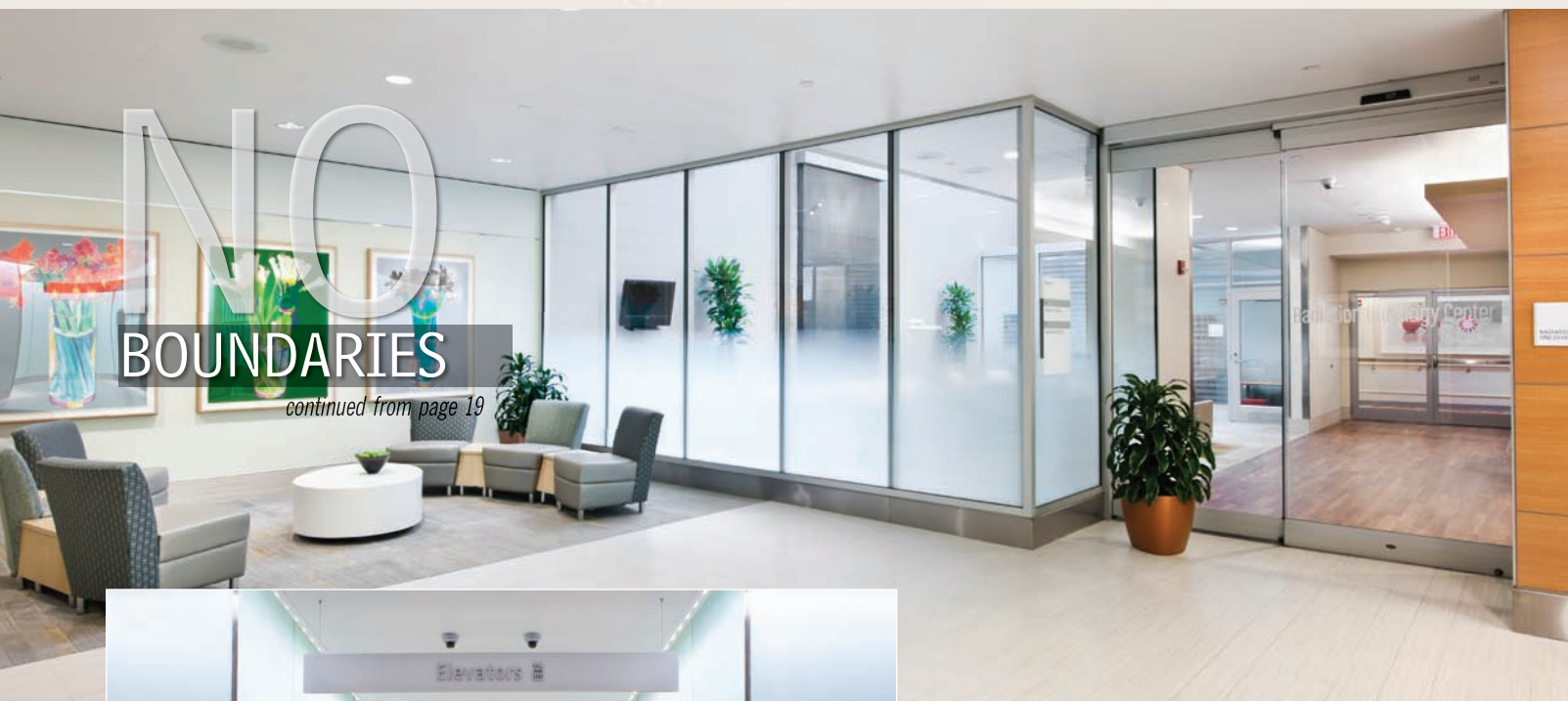
As for multi-family housing projects, Aires says, "We see growing potential for interior glazing within the club room facilities, where smaller breakout spaces can be created for private gatherings, while still allowing them to be experienced as part of the larger amenity facilities."

Prifti, also of BLT, notes, "We are incorporating glazed walls where a visual connection—yet acoustical privacy—is required and where perime-

continued on page 20

NO BOUNDARIES

continued from page 19



Photos: McGrory Glass



Above: Seidman University Hospitals Cancer Center in Cleveland, Ohio, also takes advantage of the qualities interior glass can offer.

ter daylighting is intended to penetrate into the building core. This is occurring in commercial, educational and institutional market sectors."

Further discussing what his company used in the Berkeley Law School project, Nicola, says, "The ability to bring light to the two below grade levels was paramount to the success of the project. By providing glass skylights, glass walking planks, transoms, sidelites and transparent/semi-transparent wall systems, natural light was able to filter through the occupied spaces to provide a connection to the outdoors.

"Novum was the main supplier of all the building glass systems and Teknion provided the movable interior partition system," he adds. "We also created a dynamic and kinetic glass-enclosed central staircase that creates vertical sight-lines between floors and when illuminated, casts a lantern's glow within and without."

While interior glass has been utilized in warm weather climates for quite some time, Nicola says that over the last 10 to 15 years, with the advances in high-performance glass and exterior enclosures, interior glass is becoming more prevalent in cold weather climates.

McGrory Glass officials are seeing the most

interior glass usage with health care facilities.

"Seidman University Hospitals Cancer Center in Cleveland, Ohio, utilized back-coated wall cladding glass for the lobby and elevator areas," McGrory says. "Translucent acid-etched glass [was used] for the stairwells and custom-laminated glass [was used] for the offices and patient rooms to provide privacy."

He adds, "Every architect and designer has his or her custom signature that is applied to their creations. The common thread is a uniqueness derived from years of creative endeavor.

Prestigious walls with depth and clarity are punctuated by textures and shapes. Safety and beauty are enveloped in thrilling and mesmerizing interiors where glass becomes the background for a foreground of grouped function centers."

Interior Glass a Growing Trend Going Forward

All the officials agree that looking to the future, the usage of interior glazing in architecture is likely to continue growing.

"In our academic projects, we have proposed interior glazing systems much more often of late, especially for areas that are looking to create an open feeling to the campus community, while still maintaining an ability to close up after hours," says Aires.

Aronson adds, "We see more use of interior glass, especially in hospitality projects, with no end in sight. And the inventiveness of the manufacturers is always astounding, leading to more unconventional uses. In particular, the ability to create custom images set into laminated glass offers endless options for creativity."

Nicola also says he sees interior glass usage

continued on page 22

SAGEGLASS® SHOWN IN ITS CLEAR STATE IN THE HEART SURGERY UNIT AT DESERT REGIONAL MEDICAL CENTER, PALM SPRINGS, CA

©2013 SAGE Electrochromics, Inc.

Celebrating 10 years of bringing daylight to life.

In 2003, SAGE installed electronically tintable windows in the heart surgery unit at the Desert Regional Medical Center. SageGlass filled the room with natural light, blocked glare and eliminated the need for shades and blinds.

Ten years and hundreds of projects later, SageGlass continues to enhance the lives of people in hospitals, schools and commercial buildings around the world. We're pleased to celebrate our 10th anniversary of bringing dynamic solar control to life. And we're proud to commemorate our pioneer customer.

See SageGlass in operation at sageglass.com or call us at 877-724-3321.



SAGE

Glass that tints on demand.

NO BOUNDARIES

continued from page 20

continuing to gain ground.

"With the advent of technology to offer high performance and efficient glass systems and manufacturing ability to produce glass systems which are both aesthetically beautiful, energy efficient and cost effective, there are fewer limitations and a wider array of opportunities to bring light and connectivity into buildings," he says.

McGrory says he expects even more health care facilities to turn to interior glass in the near future.

"There is a trend to use more glass in health care facilities due to the inability of bacteria to survive on the hard, non-porous surface of glass, especially in applications such as wall cladding and marker

boards," he explains.

So whether being used for more practical purposes in health care, or to bring the outdoors in and foster an increased sense of natural light, it appears the trend toward utilizing interior glazing in architecture is poised for further growth. **AGG**



Jenna Reed is a contributing editor for *Architects' Guide to Glass & Metal* magazine. She can be reached at jreed@glass.com and followed on LinkedIn.



WE NEED A FEW GOOD DEALERS

Become an Anti-Fog Systems Dealer Today

- Additional profit potential on all sales calls
- Exclusive Territory
- Expand market potential in your existing market
 - Differentiate your business from your competitors (be unique)
 - Ability to resell to other dealers in your exclusive licensed territory
 - Your customer may be eligible for generous energy rebates
- Eligibility for installs from the AFS Corporate Sales Group (increased income)

1 (855) FOG-FREE ■ (941) ANTI-FOG ■ (941) 268-4364 ■ www.antifogsystems.com

SCORPION

WINDOW FILM

ARCHITECTURAL FILM

Decrease utility costs while increasing protection, value and style to your home or office.



NEW PRODUCT LINEUP ▼

Mirage_{series}

The Mirage Series provides excellent glare and solar protection in areas of extreme heat. With a futuristic, metallic look, Mirage is a perfect option for today's most sophisticated commercial and residential architecture.

SILVER

Vision_{series}

The Vision Series provides great optical clarity and low reflectivity. With a very soft, natural color, Vision offers exception performance without any distortion, providing the clearest of view.

NEUTRAL

Flare_{series}

The Flare Series provides a very distinct look that will enhance the overall curb appeal to any home or business. With a warm, copper tone, Flare offers exceptional performance and glare control.

BRONZE

Storm_{series}

The Storm Series provides a dual reflective design that performs from the outside while enhancing the view from the inside. With a bluish tone, Storm offers exceptional heat rejection and glare control that is perfect for today's commercial architecture.

DUAL-REFLECTIVE

Spirit_{series}

The Spirit Series provides a dual reflective design that performs from the outside while enhancing the view from the inside. With a natural earth tone, Spirit offers exceptional heat rejection and glare control that is perfect for today's residential architecture.

NATURAL

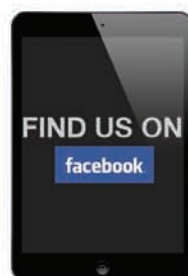


SCORPION IS
EXPANDING ITS DISTRIBUTION
NETWORK



**STAKE YOUR
CLAIM**

800-483-9087
SCORPIONWINDOWFILM.COM



WIN
A FREE IPAD MINI
GO ONLINE TODAY!

The Green Mile

Many AIA Exhibitors will Focus on Energy Efficiency and Sustainability When They Visit the Mile High City

denver, one of the greenest cities in the nation, will host hundreds of energy-conscious architects when the 2013 American Institute of Architects (AIA) National Convention takes place there June 20-22. Glazing products certainly have a lot to offer to those looking for sustainable, eco-friendly options.

Here's a look at some of the products you can expect to find when you walk the halls of the Colorado Convention Center.

curtainwall

Let's Do the Lamboo – Booth #1752

Lamboo Inc. will debut its curtainwall system technology, allowing visitors a chance to see how it has integrated the sustainable natural resource of bamboo into curtainwall members and storefront system components.

The Renewall series is made for both residential and commercial applications, bringing what the company describes as “warmth and longevity” to projects “while exceeding aluminum system’s performance through longer unsupported spans, higher fire rating, and thermal performance.” The split mullion design allows for integration of Lamboo materials with aluminum coverings for applications such as storefronts, curtainwalls and conservatories.

The coupling mullion pre-fabricated frames can be finished in the fabrication shop with base profiles, interior gaskets and glass supports.

→ www.lamboo.us



Going Together – Booth #1323

The combined Kawneer and Traco exhibit space will highlight a range of products including sun shading, impact-resistant and high thermal performing products and systems. Kawneer will feature its new 1630 SS IR curtainwall, which the company says is designed to deliver performance under pressure.

It has undergone rigorous testing to hurricane and blast mitigation standards and offers an additional line of defense against high winds, heavy rains and hurricanes. It is available in wet (silicone) glazed and dry glazed options, and offers a 3-inch sightline.

This year, Kawneer will also be presenting an on-site CEU Session, “Components of a LEED Strategy in Division 8: Glass & Glazing” on Thursday, June 20 from 10:30 to 11:30am.

The latest high-performing Traco window products will also be featured at the show.

→ www.kawneer.com

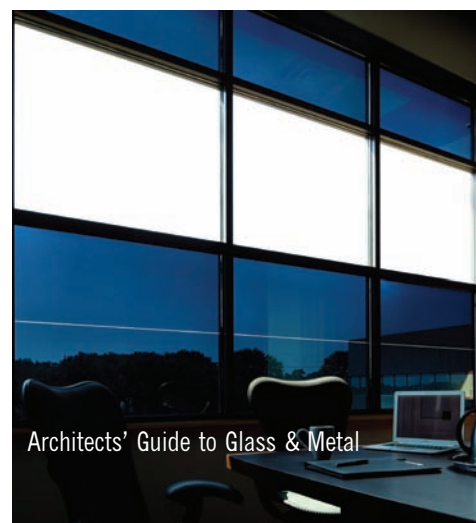
dynamic glazing

Tint on Demand – Booth #2111

SAGE will showcase its electronically tintable SageGlass® for windows, skylights and curtainwalls. The glass can be tinted or cleared enabling users to control the sunlight without shades or blinds, while maintaining views to the outdoors and reducing energy consumption.

According to the company, SageGlass tints on demand and can be zoned to better control solar heat gain and glare at any time of day. The company adds that its next-generation SageGlass, now available, has in-pane zoning capabilities allowing building occupants to change the tint in three different sections in a single pane of glass.

→ www.sageglass.com



finishes

Germ Free is the Way to Be – Booth #3139

Linetec has introduced the use of antimicrobial protection for high-touch, architectural metal products' exterior and interior surfaces, such as doors, windows, curtainwall, entrances, panels and column covers.

Antimicrobial protection is infused into select polyvinylidene fluoride (PVDF) finishes to inhibit the growth of stain and odor causing bacteria on the coating of aluminum surfaces for health care facilities, educational campuses and other buildings. As a fluoropolymer finish containing a minimum of 70 percent PVDF resin, this three-coat system meets requirements of the AAMA 2605 specification for architectural coatings.

→ www.linetec.com



Photo: BR&K Building Group of Charlotte, N.C., courtesy of Linetec.

glass

It's Super Secure – Booth #1347



Safti First announced the addition of the SuperSecure II-XLS 45-120 minutes to its product line. SuperSecure II-XLS achieved a Class A-1 rating per the California Department of Corrections (CDC) 860-09a testing requirements and meets ASTM E-119/UL 263/NFPA 251 with hose stream up to two hours, according to the company.

SuperSecure II-XLS does not incorporate wired glass, giving it a clear, wire-free appearance. Designing with SuperSecure II-XLS provides maximum security protection; protection against fire, smoke and dangerous radiant heat; high STC ratings and it comes with a five-year manufacturer's warranty.

→ www.safti.com

How Low-E Can You Go? – Booth #1736

PPG Industries has introduced Solarban® 67 glass, a solar control, low-E glass with what the company calls a soft, imperceptible neutral coating that gives buildings a crisp, clean and clear exterior appearance along with solar control performance.

Engineered with a proprietary double-silver, magnetron-sputtered vacuum deposition (MSVD) coating, PPG says Solarban 67 glass reflects the true timbre and brightness of ambient light and color accurately and authentically. The low-E coating also gives the glass levels of solar control performance not typically associated with highly transparent glass, according to the company. In a standard 1-inch insulating glass unit (IGU) with conventional clear glass, Solarban 67 glass has visible light transmittance (VLT) of 54 percent and a solar heat gain coefficient (SHGC) of 0.29, which yields a light-to-solar gain (LSG) ratio of 1.85.

Solarban 67 glass can be specified with clear glass or with blue, green and earth-toned glasses such as Atlantica®, Azuria®, Optiblue®, Pacifica®, Solarblue® or Solargray® glasses on the second or third surface of an IGU. When paired with Solarban 67 glass in an IGU, these tinted glasses offer SHGCs that range from 0.19 to 0.34 and VLT of up to 42 percent.

→ www.ppgideascape.com

continued on page 26



AIA Show

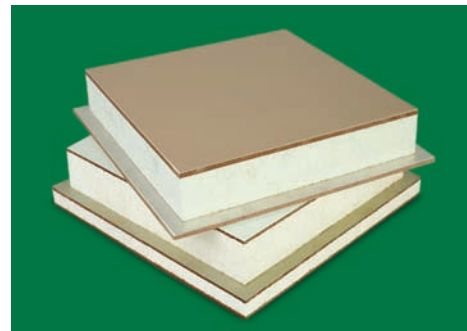
continued from page 25

Mape the Most of It – Booth #707

Mapes Architectural Panels announced the development of its new Mapes-R Plus infill panels. These modified panels have additional insulation, which the company says allows for previously unattainable R-values to be achieved without modifying the existing glazing pockets.

Mapes-R Plus panels are designed to fit any size glazing pocket and can increase R-values by more than 200 percent, according to the company, which also states that values up to R=27 are possible within a 1-inch glazing pocket. Mapes-R Plus panels can also be used in glazing pockets as small as 1/4-inch for retrofit application.

→ www.mapespanels.com



silicone solutions

Air Tight Options – Booth #1650

A number of silicone-based innovations designed to improve the sustainability, energy efficiency and durability of new and retrofit buildings will be on display in Dow Corning's booth. Featured products will include the company's silicone air barrier system, a complete air and weather barrier solution designed to provide airtight moisture control for more energy-efficient building envelope designs. The company will also offer its architectural insulation modules, which the company says is a design-enabling high-performance insulation solution for next-generation curtainwalls. Also on display will be the building insulation blanket, a thin, environmentally safe insulating material that offers freedom of design coupled with improved energy efficiency, according to the company.

→ www.dowcorning.com

doors and windows

Kolbe Does Commercial – Booth #334

Kolbe now offers a door and window product line for commercial buildings, the Kolbe 4500 Series. Created for hospitality, multi-family and mixed-use projects, the Kolbe 4500 Series includes fixed and tilt-turn windows, tilt and slide doors and outswing hinged doors. The steel-reinforced uPVC products are designed to meet commercial building requirements for enhanced energy efficiency, occupant safety, low-maintenance and longevity, according to the company.

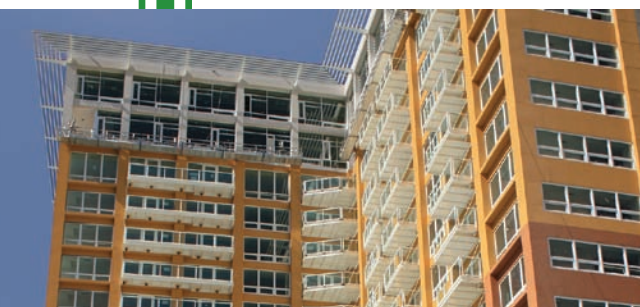
Kolbe 4500 Series windows and doors are available in two frame styles: North American 3-1/4-inch frame with nailing fins and European 2-3/8-inch frame. Dual overlapping neoprene gaskets provide a seal against air and water infiltration. One-inch insulating glass is standard, and 1-3/8-inch triple pane insulating glass is available, which allows fixed windows to achieve U-values as low as 0.17, according to the company, which also states that window units with laminated glazing options attain sound transmission class ratings as high as 39.

→ www.kolbecommercial.com

Panda Lift & Slide – Booth #1939

Panda Windows and Doors has announced the newest addition to its lift-and-slide door line, the thermally-broken aluminum wood clad lift-and-slide system (TS.13), which the company says is set to be its most weather performing system yet.

The TS.13 lift-and-slide is insulated to ensure comfort and energy efficiency in high-end applications, according to the company, and the wood interior is available in several species such as mahogany, cherry, maple, pine and oak. The thermally-isolated aluminum frames make the system strong and resistant



to the harshest elements and do not require constant finish maintenance. The company says this is because the technology consists of separating the aluminum profile and placing a glass fibers integrated polyamide iso-bar in the middle to provide maximum strength and 500 times less thermal conductivity than non-extruded aluminum.

All of its lift-and-slide systems operate by “a simple turn of the handle” for a smooth operation. All frames are finished with custom colors in powder coat, kynar or anodized. The option to produce a two-tone color piece is also available.

→ www.panda-windows.com

On a Roll – Booth #1903

Klein USA has introduced its new Rollglass Self self-closing sliding glass door system. Designed to replace a traditional swinging door, the system features a single, frameless interior sliding glass door in series with either one, two or three fixed frameless glass panels. After the door is opened, the door panel closes by itself according to eight different adjustable speed settings.

The sliding glass panels are available up to ten feet high with either 3/8-inch or 1/2-inch thick glass. The design of the glass installation allows in natural light, and the system is ceiling mounted so no floor track is required.

→ www.klein-usa.com



BIM

Guardian Debuts BIM Solution – Booth #1916

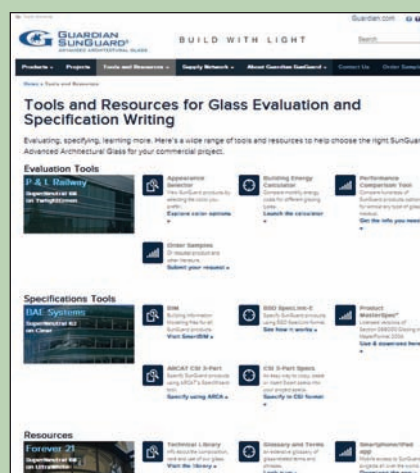
Guardian Industries will launch a first-of-its-kind building information modeling (BIM) solution as well as a new SunGuard low-E glass for commercial applications.

The company's new web-based BIM Generator, available at www.sunguardglass.com, populates manufacturer data for thermal and optical performances of project specific customer IG make-ups in the BIM format. The BIM Generator creates detailed content that represents the correct thickness and color of the inboard and outboard lites. By leveraging visibility settings, users can control the level of detail depending on the desired scale of the view. The content is created for Revit 2013 to take advantage of Revit's material analytics for energy simulations. In addition to specific customized makeups, standard makeups will be available for download at www.sunguardglass.com, Autodesk Seek, and SmartBIM.

Also making its debut is SunGuard Neutral 78/65, a commercial glass product that provides high visible light, high solar heat gain and a neutral color. Neutral 78/65 can be used in double- or triple-glazed units, and in combination with the SunGuard portfolio of high performance low-E coatings.

Guardian will also present its InGlass interiors portfolio, including Guardian Reveal, glass that transitions from transparent to privacy in a single click.

→ www.guardian.com



continued on page 28

AIA Show

continued from page 27

Visit the Architects' Guide to Glass & Metal magazine!

Be sure and stop by booth #3617 to visit with the staff of the Architects' Guide to Glass & Metal. You can pick up free copies of the magazines, sign up for our free e-newsletters, as well as our many other publications. We look forward to seeing you in Denver!

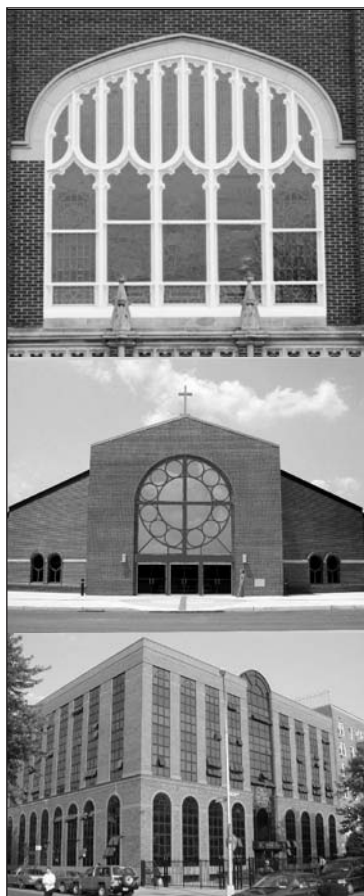


Amaba Offers Sliding Door Options – Booth #3062

Amaba Products offers a number of glazing selections, including a decorative stainless sliding door system that the company says is both practical and visually appealing. The system is available in pure stainless steel as well as a variety of other materials. According to the company, the system is ideal for applications where space is limited. They are also ADA-compliant and can be used in both residential and commercial applications.

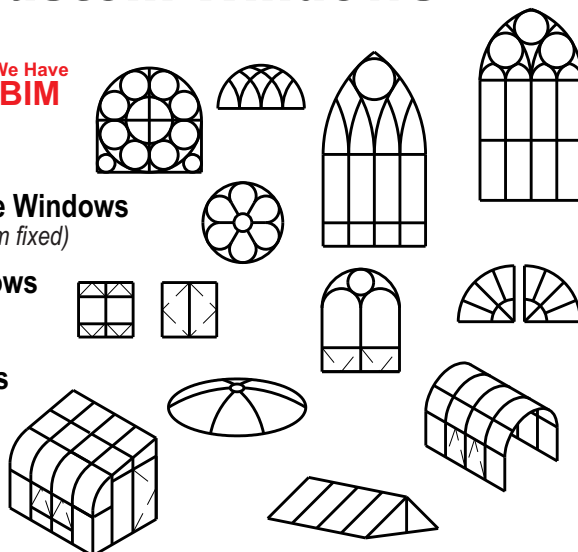
In addition, the company also offers 100-percent stainless steel towel warmers available in a number of different finishes.

→ www.ambaproducts.com AGG



Manufacturers of America's Finest Custom Windows

- Custom Shaped Windows **We Have BIM**
- Church Windows
(for Stained and Protective Glass)
- Narrow Profile Equal Silteline Windows
(ventilators are indistinguishable from fixed)
- Historical Replication Windows
- Hurricane/Impact Windows
- Dual Color Thermal Windows
- Skylights, Walkways, etc.
- Metal and Glass Bending
- Sunbilt Sunrooms



Family Owned and Operated Since 1906

J. SUSSMAN, INC.

109-10 180th Street • Jamaica, New York 11433
Tel: 718-297-0228 Fax: 718-297-3090

www.jsussmaninc.com

FINE ARCHITECTURAL METAL PRODUCTS AND SERVICES



www.sunbilt.com

WINDOWS • SKYLIGHTS • WALKWAYS • SUNROOMS • GLASS and METAL BENDING



COMPLETE SOLUTIONS FOR THE GLASS INDUSTRY! **(800) 919-7181**

*Polishing at
the highest level*

FUSHAN Polisher by IGE Glass Technologies, Inc

FP10-45



Well accepted by the most famous and prestigious glass fabricators, Fushan delivers quality and Value while increasing production and profits.

FP14-45



FP10P

Fushan Polishers are heavy duty, well built and well engineered straight line glass polishing machines.

Known for lower maintenance costs, fewer breakdowns and the highest quality polish attainable, Fushan Polishers will soon be known as number 1 in the United States and Canada.



offering complete service, toolings & spare parts
www.IGEsolutions.com

Photo: CWAarchitects

A Time to LEARN

With Full Glass Usage, Schools Can Still Be Safe and Secure

By *Ellen Rogers*

They might as well have said, "Windows; who needs them?" In 1964 the Manual of Regulations and Recommendations for School Building Planning and Construction from the Idaho State Department of Education, Boise, noted that "The increased use of artificial lighting and forced ventilation has made the use of windows less important. The construction of buildings with no windows has proven satisfactory in many cases."

In 1999, the Heschong Mahone Group Inc. said otherwise in its report, "Daylighting in Schools," which was completed for Pacific Gas and Electric. The study examined school districts in three states. In Seattle, Wash., and Fort Collins, Colo., where end-of-year test scores were used as the outcome variable, students in classrooms with the most daylighting were found to

have 7 to 18 percent higher scores than those with the least. In San Juan Capistrano, Calif., where the study was able to examine the improvement between fall and spring test scores, the study found that students with the most daylighting in their classrooms progressed 20 faster on math tests and 26 percent faster on reading tests in one year than in those with the least.

Yet the shootings last December in Newtown, Conn., reminded the world that glass, more often than not, is perceived as the weakest link. As the Sandy Hook shooter reportedly shot his way into the school through glass in the entrance, questions and concerns sprang forth across the nation over the use of glass in schools. Should its use be limited? Should it be removed completely, returning schools to the windowless brick boxes of the past?

For a private, urban high school in Los Angeles, CWAarchitects used a stone base to a height of 14 feet with a translucent curtainwall above. The design allows for natural light, while also ensuring privacy from the street.

Daylight Findings for Capistrano School District

Difference as a % of District Average Improvement in Fall to Spring Scores



Daylighting, minimum to maximum

Looking at the ratio between fall and spring tests in Capistrano, Calif., HMG found students in the most daylit classrooms had test scores that improved 20 to 26 percent.

Daylight Findings for Seattle School District

Difference as a % of District Average Spring Test Scores



Daylighting, minimum to maximum

In Seattle, HMG researchers looked at the end of the year test scores and found students in classrooms with the most daylighting tested 13 to 9 percent better than those in classrooms with the least amount of daylighting.

Daylight Findings for Fort Collins School District

Difference as a % of District Average Spring Test Scores



Daylighting, minimum to maximum

According to the HMG study, students in Fort Collins, Colo., classrooms with the most daylighting had a 7 percent increase in math and reading scores on spring tests.

Source: Hescong Mahone Group

The question of glass usage in educational facilities is one that must be balanced carefully. While in its simplest form glass may be more vulnerable to breakage, intrusion and security violations than other materials, such as brick and concrete, the benefits weighing in its support are strong. There are options, design tactics and products that can be incorporated into school projects that will strengthen the building envelope and increase its level of safety.

And the Bricks Came Down

New construction school designs have seen a tremendous evolution.

"As they say, 'back in the day' educational facilities were typically brick buildings with single or double hung windows," says Donnie Hunter, manager, architectural promotion with Kawneer Co. Inc. "Over the years we have seen a change to fewer operable windows in walls that resembled military or institutional, prison-type buildings. Today, educational facilities are going back to using windows for ventilation and to provide additional sources of natural light."

Mike Turner, vice president of marketing for YKK AP America, says many school designs have taken on a modern aesthetic thanks to the variety of window products available.

"Especially at the high school level, those designs are incorporating products such as curtainwall in staircase areas as well as across the main facade in greeting areas as a way to provide daylight into those spaces," says Turner.

Architect Christopher Ward of CWArchitects based in Pasadena, Calif., agrees. "Glass allows light in and makes for a more cheerful space and many studies have been done that show daylight or even the perception of daylight ... improves performance in classrooms." Improvements also

include better attendance and participation, as well as an overall improved attitude among students, Ward says.

Multiple Choices

Safety glass, however, is not new in schools. In fact, federal law (CPSC 16 CFR 1201), requires its use.

According to Mila Kennet of the Department of Homeland Security Science and Technology Resilient Systems Division, while laminated and tempered glass types are both considered safety glass, they behave very differently with different performance expectations.

"Laminated glass holds the glass particles together and monolithic tempered glass breaks into thousands of small particles," she says. "Laminated glass, therefore, provides more debris control than monolithic heat-strengthened glass."

She continues, "Aside from aesthetics, the building envelope has a huge impact on a variety of building functions, and these also include security. A fundamental protective measure is to use anti-shatter materials, such as laminated glass, and wet glaze the glass within the frame (structural silicone) to develop the capacity of the laminate and prevent bite pull-out in response to extraordinary loads."

In the United States, the use of tempered glass is typically more common than laminated glass. That may be changing, however. Ron McCann, director of international sales with Owatonna,



Photo: YKK AP

Glebe Elementary School, in Arlington, Va., features products such as curtainwall, storefront, windows and sunshades for an abundance of natural light.

continued on page 32

A Time to LEARN

continued from page 31



Photo: Hurfon+Crow

Large spans of glass within the Evelyn Grace Academy in London allow teachers to have visual contact to the outside school grounds.

Minn.-based Viracon, says his company is seeing an increasing use of laminated glass in schools.

"Schools have been incorporating laminated glass for vandalism more than anything else," says McCann. "We've also seen its use grow for sound control [purposes]."

Jon Johnson, general manager of Trudeco/Trulite in Columbus, Ohio, believes there is a wide variety of products, such as laminated glass, that can meet virtually any type of threat—using the products in the appropriate setting, though, is what will help make a difference.

"If [the school] is in a higher crime/threat area, for example, architects could specify a more robust system," he says. In a setting such as Sandy Hook, the entrance area was the only part affected. Johnson says in a case such as this, having a means to slow the intruder's entry, such as laminated glass, would allow school officials more time to call local authorities.

Glass is also important for schools because it helps in surveillance. Kennett explains that in many instances having glass of the appropriate thickness can provide additional response time "and would help to provide more surveillance to see who is coming ... each case is different and glass has to be designed at the level of protection intended [for each school]."

And in these designs, the primary intent is to ensure the safety and security of the occupants without having them feel restricted or afraid.

"For the main entrance you want it to be safe

and secure, but not a fortress where people think they are going into a dangerous building," says Meghan E. Beach, architectural manager, AGC Glass Co. North America.

Design Tactics

Carefully considered designs can allow for the incorporation of glass, providing natural light benefits. The Evelyn Grace Academy in London stands as such an example. Designed by London-based architectural firm Zaha Hadid Architects, the school is located in an area with one of the highest crime rates in Europe.

"This meant a lot of the students attending the school come from backgrounds where they are exposed to gang culture or unstable family backgrounds and therefore are at risk," says project architect Bidisha Sinha. "The school, in-turn, has a very strong agenda of giving the students an environment that feels safe for them and allows them to achieve their best potential without them feeling constantly policed. This means that all supervision needed to be discreet and passive."

Sinha says this goal was achieved by creating an interior feature out of vision glazing that flanks all classroom doors, so that at any given point visual contact could be established within circulation spaces and teaching accommodations. Likewise, all corridors ending in staff rooms have glazed partitioning, thereby never allowing for a "dead end," which could be an area for incidents.

"Externally, this same vision was extended by allowing most teaching accommodations and shared facilities, especially at the ground level, to have a large expanse of glazing thereby always maintaining a visual contact to the external play areas," Sinha says. "It also enables students and the extended community to visually engage with the sporting and cultural activities happening within the school, providing a sense of motivation and camaraderie."

Sinha says the entire ground floor of the school features tempered and laminated glass; the upper floors feature laminated glass for balustrades and full-height partitions. **AGG**



kuraray

TROSIFOL.com/en

WHAT TRANSFORMS GLASS INTO A SHIELD?

At Kuraray, we make good products even better. Our industry-leading TROSIFOL-PVB films have made glass safer for over 60 years. Laminated safety glass used in windshields protects you and your family on the road, and our architectural glass interlayer serves as a barrier against burglaries, hurricanes, blasts, and more. Invisible, strong, and dependable, our films transform everyday glass into everyday protection.

Beyond the surface.

TROSIFOL®

Education and Resources

Fire Protection.
Design Perfection.

aluflam

Fire-Rated Aluminum
Window And Door
Systems

For beauty, the best in safety and design flexibility look to Aluflam. Built to blend effortlessly with non-rated storefront and curtain wall systems, our virtually limitless portfolio includes true extruded aluminum vision doors, windows and glazed walls fire-rated for up to 120 minutes. You'll see why we've become the favorite of architects and installers alike. Aluflam gives you a barrier to fire, not inspiration.



Aluflam USA
Phone 714-899-3990 | Fax 714-899-3993
Email info@aluflam-usa.com
www.aluflam-usa.com

Linetec Offers Online Architectural Resources

From its blog to e-newsletters, videos to on-demand continuing education programs, Linetec offers a number of online resources designed to help architects better understand architectural finishing.

The company has a blog that provides technical tips, project highlights and other news items. It also offers a monthly educational newsletter that tackles topics covering common and unique challenges. It also offers suggestions for improving aesthetics, performance and other technical applications.

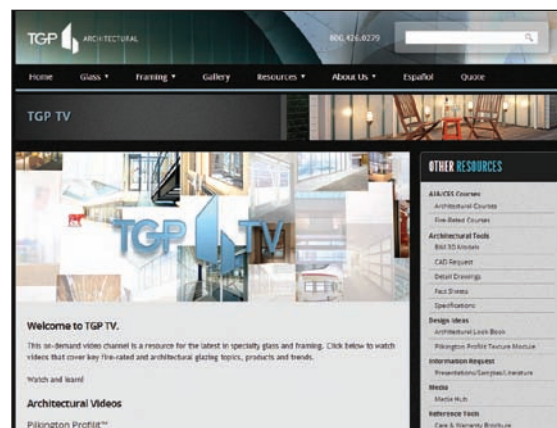
The company also offers an Architectural Resource Center where visitors can download guide specifications for high-performance architectural coatings, request paint sample color chips, learn about sustainable design considerations and more. Likewise, video postings can be found on YouTube's "Linete Anodize Channel." Here, along with its anodize featurettes, viewers can learn about painted coatings.

→ www.linete.com

TGP TV Looks at Trends in Fire-Rated and Specialty Glazing

Architects, glaziers and other building industry professionals can now catch the latest news on fire-rated glazing and specialty architectural glass and framing products, applications and related topics by watching TGP TV, a new web-based video library from Technical Glass Products (TGP). Viewers can watch the on-demand segments free of charge on TGP's websites: tgpamerica.com/tv and fireglass.com/tv or on the company's

YouTube channel: www.youtube.com/user/TGPFireglass.



TGP TV features videos on innovative products and on a variety of educational subjects of interest to building industry professionals. Product videos demonstrate uses and applications for TGP fire-rated and specialty architectural glass and framing products through case studies and third-party testimonials. Educational videos cover a wide variety of fire-rated and other specialty glazing topics, including answers to common building code questions, how-tos for solving design challenges, problem/solution case studies and installation tips. The company plans to continue developing additional video segments to add to the library over time.

"TGP TV is designed to be a quick and easy visual reference that's available to design and building professionals around-the-clock," says Jeff Razwick, vice president of business development for TGP. "In less than three minutes, they can learn the basics of how a product functions, access solutions to design challenges or learn more about code issues relevant to building design."

→ www.tgpamerica.com AGG

What's Your Fave?

Got a favorite resource for glass information? Is there a tool you use frequently for specifications and technical information? What websites do you turn to again and again? We'd like to know! Let the *Architects' Guide to Glass & Metal* know what glass-related tools and resources you find most helpful. Just email erogers@glass.com about the resources you need when it comes to glazing and we'll share the information right here in this section. We look forward to hearing from you!

Event Outlook

NORTH AMERICAN EVENTS

June 10-12, 2013

Neocon 2013

Sponsored by Merchandise Mart Properties

Merchandise Mart

Chicago

Contact: www.neocon.com

June 20-22, 2013

AIA 2013 National Convention

Sponsored by the American Institute of Architects (AIA)

Denver Convention Center

Denver

Contact: www.aia.org

August 22-25, 2013

2013 CRAN Symposium: Elevating the

Art of Residential Design & Practice

Sponsored by AIA Custom Residential Architects Network

La Fonda on the Plaza

Santa Fe, NM

Contact: www.aia.org/CRAN

September 10-12, 2013

GlassBuild America 2013

Sponsored by AAMA, BEAMA, GANA, IGMA and NGA

Georgia World Congress Center

Atlanta

Contact: www.glassbuild.org

October 16-17, 2013

Neocon East

Sponsored by Merchandise Mart Properties

Baltimore Convention Center

Baltimore

Contact: www.neoconeast.com

October 31-November 1, 2013

Glass Expo Midwest™ 2013

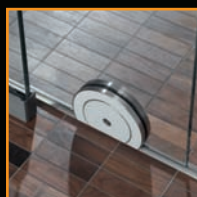
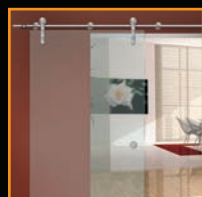
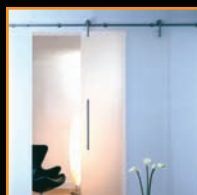
Sponsored by USGlass magazine

Renaissance Schaumburg Convention Center Hotel

Chicago (Schaumburg), Ill.

Contact: www.usglassmag.com/gems **AGG**

Send information
about upcoming
events to
erogers@glass.com.



Amba
products

**DECORATIVE
STAINLESS STEEL
HARDWARE**

**Sliding Door Systems
Hardware & Pulls**

www.ambaproducts.com
(404) 350-9738

SEE US AT THE AIA CONVENTION

Continuing Education Corner

Glass and glazing, metal systems and various other fenestration technologies are continuously evolving. As a result it's important for the

architectural community to stay up-to-date on the most recent information in a variety of areas. Keep yourself informed about these many options, and consider some of these industry courses. You'll gain valuable information and knowledge while also earning continuing education credits.

Course Title: **Silicone Sealants for Structural and Protective Glazing**

Provider: **Dow Corning**

Learning Units: **1; HSW credit**

The course defines and explains the purpose of silicone structural and protective glazing. It looks at how protective glazing systems work, appropriate materials, methods and quality-assurance tests for structural and protective glazing, as well as the impact of natural hazards and terrorist activities on glazing systems.

→ www.dowcorning.com

Course Title: **Glazing Design for High Velocity Wind Zone Areas**

Provider: **Crawford-Tracey Corp.**

Learning Units: **1; HSW credit**

Designing for hurricane and high wind zones requires special consideration. Architects taking part in this program will examine the use of high performance commercial glazing systems used in high velocity wind zone (HVHZ) areas, such as South Florida. The course addresses how the performance, codes and safety of exterior glazing systems affect design considerations and applications. After completion of this course, participants should be able to understand wind load requirements and design parameters in HVHZ areas; understand wind-borne debris requirements for glazing systems in HVHZ areas; understand the necessity for product approvals in HVHZ areas; and understand the glazing systems and various design options in HVHZ areas.

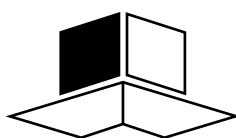
→ www.crawfordtracey.com AGG

If your company offers an AIA continuing education course please let us know about it by emailing erogers@glass.com



GET TOUGH

How tough? We're talking blast resistant large and small missile rated-bullet resistant stands up to a hurricane tough. Just ask for "MapeShield Panels tough." We'll know what you mean.



mapes

ARCHITECTURAL PANELS

800-228-2391 | www.mapes.com

SEE US AT THE AIA CONVENTION



**FAST, KNOWLEDGEABLE AND
ALWAYS AT YOUR SERVICE.**

- **STRUCTURAL**
- **STOREFRONT**
- **RESIDENTIAL**
- **GLAZING TAPES**
- **MIRROR MOUNTING
& UHB TAPES**

CapitalTape

www.CapitalTape.com



It'll change the way you look at neutral glass.

Introducing Solarban® 67 glass. A crisp, vibrant neutral glass that stands out from the crowd. For a sample, call 1-888-PPG-IDEA or visit ppgideascales.com/sb67.

Solarban, IdeaScales, PPG and the PPG logo are trademarks of PPG Industries Ohio, Inc.

