

Everything I Learned About Glass ...

I Learned at the Glass Fabrication and Glazing Educational Conference

by Megan Headley and Ellen Rogers

A fresh batch of faces learned the basics of the fabrication and glazing industry during the Glass Association of North America's (GANA) annual Glass Fabrication and Glazing Educational Conference, which took place this year April 6-8 in Cincinnati. The conference is geared toward individuals with five or fewer years in the industry as it provides an educational foundation in a number of essential areas.

For those of you who didn't make it yourself, we have a few of the essentials here for you. And if you're not new to the industry yourself, we're sure you're eager to pass on your knowledge about glass to someone who is; be sure to pass along the following tips and information as well.

Oh So Trendy Glass

Ron McCann of Viracon addressed some of the latest trends to hit the glass industry. When it comes to applying these trends into practice, McCann noted, "The key is figuring out what the drivers are for your clients." Knowing what needs your client is trying to meet can help you as the supplier or installer steer them toward those "trendy" new products that are the most appropriate solution for their project.

1. McCann said that "much larger sizes" than previously used are becoming the norm. In conjunction with that, comes thicker glass and a move to low-iron, McCann pointed out. As lites become larger in area, an increase in thickness is necessary to prevent bending. With thicker glass may come a deepening of the green tint caused by iron content, leading to further requests for low-iron glass.

2. In addition to bigger, heavier glass, McCann said glass is being specified for multiple applications. For example, you might find on your next job a request for a high-performance coating on a glass that also must be impact-resistant and fabricated into a thermally efficient insulating glass (IG) unit to boot.

3. McCann also addressed the growing demand for energy-efficient glass. New generations of glass coatings will further help designers let light in while keeping heat out. While double silver low-E coatings are popular now, McCann said, he predicts that triple silver coatings will become more prevalent.

Cutting and Edging Correctly

Chuck Beatty of Edgeworks Inc. discussed automated glass cutting and edging techniques. Among his tips were the following:

1. The less energy you send into the glass while scoring the cut, the smoother the resulting edge after the break-out.

2. Use a sharper wheel angle for thin glass and blunter angle for thicker glass.

3. Beatty said people often ask him how long cutting wheels last. It's different for different things, he said, but he tells people: "These carbide cutting wheels are not very expensive ... compared to the cost of the glass. If an operator waits until the glass breaks to change the wheel, he wouldn't work for me."



Glass Tempering Systems for the 21st Century

Chuck Cocagne with Glassrobots Oy talked to his audience about the glass tempering process, how systems are evolving and how many of these changes are related to architectural glass trends. Cocagne shared the following:

1. There are three types of tempering furnaces: radiation, convection and conduction. Radiation involves heating with electromagnetic waves from the furnace heating elements. This once-preferred method is not used as commonly as in the past since newer low-E coatings are designed to reflect that heat away from the glass. Convection heating is where hot air is blown onto the glass; and conduction involves bringing the glass into direct contact with a hot material, typically ceramic rollers.

Passing the Test

Larry Livermore of Architectural Testing Inc. presented information on the successful “Testing of Architectural Glass and Framing Systems” to ensure a finished project’s success.

1. Testing a mock-up in a lab or in the field can help to uncover design issues and installation problems, Livermore said. “They establish a benchmark of performance and installation expectations,” he added.
2. Before testing, define the area of the mock-up to be tested, whether it’s a run-of-the-mill portion or the most complex part of the project, a flat wall or a corner, etc. Each party in the process needs to be involved in the decision-making process, he said, which needs to clearly identify responsibility for different wall types. During the testing is when the contractor should start to establish a benchmark of quality they’re looking for in the field.

Know About Mirror Before It Reaches the Wall

Rick Cummings of CKV Products walked an audience of about 30 glaziers through tips and techniques for accurate measuring and cutting of mirrors during a mirror installation demonstration. Benny Walker of Vitro America provided some additional tips and techniques.

1. When it comes to fabrication, Walker said, keep your work area clean, since grit and dirt can hurt the mirror’s front and backing. Wearing gloves and vacuuming the cutting table area were some of the suggestions he offered. For grinding and polishing operations, he stressed the importance of using clean, fresh water and an appropriate coolant as a lubricant. “pH is important. It can mess up your mirror, and it can mess up your machine,” he noted, adding, “Machine set-up is so important.”

2. Cocagne said he believes that a large portion of future glasses will have high performance coatings and many will be coated on both the top and bottom. There also will be a push for processing more ultra-clear glass, larger lites and increasingly thinner glass. “Furnaces of the future will need to be able to accommodate all of these demands,” he said.

3. Cocagne said we can expect to see tempering systems include short cycles of convection heating, as the market will be driven by high production volume with low operational energy consumption; a move toward hollow rollers, which can help minimize conduction heating effects and provide control for convection heating from the bottom; and “smart” control systems for bed loading, furnace heat control and quality control.

3. During the test itself, Livermore said, “It would be a good idea to have everyone involved survey the test chamber.” If something isn’t adequate, it’s better to point that out before the unit fails the test. In addition, he stressed the importance of remembering to go back to the mock-up drawing to note changes that take place once the set-up or testing process has gotten underway. “This is critical,” he said. The owner and test lab also need to be notified of any deviations from the original mock-up design. Livermore added, “Everything we do on the test we’ve got to carry through on the drawings and in the field—so the last thing we want to do is a band-aid fix.”



2. “Please do not use silicone ... use mastics,” Walker said, adding, “I’ve seen people send the mirror back and say the mirror was bad when the mirror was the only good part. It was the silicone.”

3. He also reminded the audience not to use ammonia cleaners that can remove the copper layer if applied on the mirror’s edge. “Then all you’re left with is silver and it’s just like the silver in your home: it tarnishes,” he said. “I cannot stress enough to leave that copper alone and that means don’t put stuff on it.”

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Considerations for Laminating Low-E Glass

Both low-E glass and laminated glass are used commonly in residential applications. However, using them in combination actually negates the low-E's performance qualities. "This is because the low-E coating is buried inside the laminated lay-up," explained Jeff Haberer of Cardinal Glass Industries during his presentation. He quickly noted, though, that combining the two still can be appropriate in certain applications. He shared a number of points about the combination with his audience.

1. Low-E coatings are designed to reflect far infrared (heat) energy and they need to have an airspace, as in an insulating glass unit, to perform. When used in a laminated make-up, the coating reflects and absorbs ultraviolet and near infrared heat. Most of the visible light passes through so the glass does offer high visible transmittance, as well as a low solar heat gain coefficient.

2. When considering adhesion, Haberer said that interlayers may bond differently to coatings than to non-coated glass. To make sure that the glass composition is right, he stressed the importance of testing, including the pummel test, boil test, ball drop and bag drop tests. Durability issues, such as corrosion and de-lamination, also need to be addressed. "Pyrolytic coatings are less susceptible to corrosion since they are fired onto the glass," Haberer said. "Sputter coatings are more susceptible since they are silver-based and silver, which is sensitive to moisture, can tarnish."

3. There also can be concerns with the interlayer materials. Some, such as PVB, are hygroscopic, meaning they tend to wick moisture away. Other materials, such as an Ionoplast interlayer, are not hygroscopic, so there is no moisture wicking and less risk of corrosion.

A Day in the Life of a Project Manager

There's a lot to keep in mind if you want to be successful as a project manager in a contract glazing business. Andrew Gum, president of Thomas Glass Co. Inc. in Columbus, Ohio, provided conference attendees with a few bits of advice to help them better succeed at project management.

1. One key tip, Gum suggested, is to learn to manage your day, which includes prioritizing and making task lists for the day and/or week that cover the things that absolutely must be done, things that need to be done and things that should be done. "Also, allow time in your day for unscheduled events and be realistic about what you can get done each day," Gum said.

2. Maintaining successful, positive relationships also is important. "Know your company and its culture," said Gum, who advised making sure that you have the right people working in the right places so that every-

one is able to work best together. He also talked about the importance of relationship building with your staff. "Take time and make an effort to acknowledge a job well done," he said.

3. Holding productive meetings will help ensure all projects are handled smoothly. Gum advised everyone to make sure they are prepared for their meetings and that they plan out an agenda in advance. "Begin the project with a kick-off meeting so that you can create a project cost budget that everyone can understand," he said. He explained that this is an opportunity to talk about the materials that will be used, labor, subcontractors, etc. A close-out meeting provides a chance to talk about the products and materials used, what worked well and what did not.



Ensuring Quality Laminated Glass

The use of laminated glass in architectural applications, whether for safety and security purposes or even sound control, has seen much growth in recent years, as has the number of glass fabrication companies offering laminated products. To help companies understand how to ensure a quality laminated product, Dan Laporte from Solutia Inc. discussed some of those issues.

1. Storage and handling PVB is an important aspect of ensuring a quality laminated product. Storing the material in a way that maintains the packaging integrity will help keep out moisture and contamination. PVB, LaPorte said, has sponge-like characteristics and it will suck up water. It also is an adhesive and will stick to itself if not stored properly. "So store the PVB in a temperature between 40 to 50 degrees Fahrenheit," Laporte said.

2. Cutting, cleaning and preparing the glass for lamination also is important. Make sure the glass cutting equipment is in good working conditions so that lites are cut neat and evenly; change the glass-washing tank regularly and use a water washing temperature of between 120 and 140 degrees Fahrenheit. Dry the glass thoroughly and uniformly.

3. A proper clean room environment is critical in assembling glass. "The room has to be ultra-clean," Laporte stressed. If it's not, the PVB will pick up contaminants [that will end up as part of the glass]." Laporte suggested having double entry doors leading to the clean room to ensure the factory floor environment is not brought in and using tacky mats to prevent dirt from being not brought in on shoes.

Third-Party Inspection of Glass Fabrication and Installation

"Glass is so important. It's the face of the building; it's where architects really try to express themselves so a [lot has to go into] selecting the glass," Israel Berger, president of New York-based curtainwall consulting firm Israel Berger & Associates, told his audience as he explained some of the ways third-party inspectors and consultants can provide assistance on projects.

1. Third-party objectives can include assistance in ensuring code and construction document compliance; backstopping vagueness in codes and construction documents; and verifying proper coordination between glass manufacturers and curtainwall contractors.

2. Why might a third-party inspector be brought onto a project? Sometimes it's mandated by code and other time it's requested by the owner or client. In other cases it could be requested by the architect/engineer.

3. Third-party inspectors also can help verify quality and consistency of the glass products. Inspection methodologies vary from job to job, although a raw material inspection is often used for flat glass. "So often glass is treated like a commodity, but it's important to verify the quality and consistency," Berger said. "Third-party inspectors can help the project team through the construction phase . . . and understanding quality control obligations," he added.



When Insulating Glass Units Fail

Bill Lingnell of Lingnell Consulting Services and technical consultant for the Insulating Glass Manufacturers Alliance shared tips from his "Field Investigations with Insulating Glass Units."

1. For starters, he advised attendees that in conducting their own investigations they make their goal trying to prove what they believe is not true, so as to not run the risk of coming to conclusions based on assumptions.

2. Among the information that will assist in an investigation, Lingnell advised checking for information on glass performance, such as replacement records and evidence of seal failures or breakage; reviewing maintenance schedules; studying plans and specifications; and checking with the installer and fabricator for additional background if needed.

3. Lingnell said that the next step in conducting the investigation should be to ask: "What's different?" By looking for factors that could have changed the system in some way, such as runoff, for example, the investigator can determine what may have led to the failure.

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