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glass

magazine

TOP 50
GLAZIERS
25TH
ANNIVERSARY
EDITION



COMMERCIAL
WINDOW
SHOWCASE

25 YEARS
OF GPD

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G L A S S M A G A Z I N E ' S
T O P 5 0 G L A Z I E R S



2 5 T H A N N I V E R S A R Y

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FROM THE NATIONAL GLASS ASSOCIATION
AND GLASS MAGAZINE

TRACKING GLAZING INDUSTRY PERFORMANCE,
TECHNOLOGY AND TRENDS FROM 1992-2017
BY KATY DEVLIN AND NORAH DICK

GLASS MAGAZINE

INTRODUCED THE
SURVEY TO GAUGE
TRACK TRENDS AND

THE INAUGURAL TOP 50 REPORT, THE NORTH AMERICAN GLASS INDUSTRY
CONTRACTION; IT BECAME A KEY PLAYER IN THE NEW ERA OF GREEN BUILDING
MORE STRINGENT BUILDING CODES IN THE WAKE OF EVENTS SUCH AS

In the past 25 years, the glazing industry grew in value, as glass continued to dominate traditional façades and began to take over in new applications inside and out of the building. The industry also watched as one-time behemoths shuttered their doors, and as new firms entered and changed the market. The following pages present the Top 50 Glaziers 25th Anniversary special report, which takes a closer look at where the industry has been, how it's changed and where it's going. The anniversary report tracks changes in sales over the years, looks at two decades of U.S. glazier employment and wages, and identifies events that have changed the face of the industry. Additionally, the 25th Anniversary Edition recognizes the companies that have been highlighted in the Top 50 program year after year.

LOOKING BACK

Glaziers say nearly every aspect of the glazing trade and glass industry has transformed in the last 25 years. The

products have evolved, the equipment has changed, the projects have become more complex. At the root of nearly all of these transformations, they say, is technology. "One of the most prominent changes in the industry is the use of technology in all its forms," says Jeff Haber, managing partner for W&W Glass, wwglass.com.

Technology has changed communication. The internet, which was in its infancy when Top 50 Glaziers launched, did not become ubiquitous in the construction business until the early 2000s. "The biggest change I have seen over the past 25 years is the way we conduct business with changes in technology and communication," says Don Haley, co-founder of Haley-Greer, haleygreer.com. "We have gone from snail mail to email, and now to tablets and smart phones onsite, to conduct daily business."

Technology has changed work processes for companies, whether it is transferring documents, computer modeling or information sharing, glaziers say. It has set the stage for more collaborative project processes. "We have gone from hand writing estimates, take offs and

schedules to utilizing software programs to complete these tasks," Haley says.

"Technology has had a large impact on how we do business and how quickly things can and do change, including computer modeling, BIM and electronic file sharing," adds Bill Kruger, national director of preconstruction services, Harmon, harmoninc.com.

"For job sites [we've seen] the advent of the hand-held radios to cell phones, to smart phones, to tablets. For office—the use of faster and faster computers and software created specifically for the construction industry," W&W's Haber says.

Technology has opened the door for more complex designs, and for new and better performing products. "The variety of products now is so much greater than we ever had before," says Anne-Merelie Murrell, owner and chairman of the board for Giroux Glass, girouxglass.com. Additionally, "more efficient, precise and automated fabrication [has led to] fewer imperfections in the glass—a better quality of glass," she says.

"The advances in glass and materials

TOP 50 GLAZIERS REPORT IN 1992, LAUNCHING AN ANNUAL
THE HEALTH AND PERFORMANCE OF THE U.S. GLAZING INDUSTRY,
AND RECOGNIZE LEADING COMPANIES. IN THE 25 YEARS SINCE
WY WITNESSED PERIODS OF STRONG GROWTH AND OF PAINFUL
UILDING AND HIGH-PERFORMANCE DESIGN; AND IT ADAPTED TO
HURRICANE ANDREW AND 9/11.

have made what we do a lot more fun, at times, and given the end users a much better product,” adds Jim Stathopoulos, CEO, Ajay Glass, ajayglass.com.

Glaziers point to several major product advancements in the last 25 years: the takeover of unitized curtain wall; the growth of higher performance glass and metal systems; and the development of new glass technologies such as electrochromics. The surge of the green building movement, in particular, drove product development and improvements to façade design, they say.

LOOKING AHEAD

Glaziers expect the next 25 years to continue building off the developments of the last 25. For one, technology will continue to drive production, process and product development, they say. “Technology is forever evolving and will continue to be a driver to excellence in our industry,” says Harmon’s Kruger. “Staying in tune with advances in computing and equipment technology

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TECHNOLOGY IS FOREVER EVOLVING AND WILL CONTINUE TO BE A DRIVER TO EXCELLENCE IN OUR INDUSTRY. STAYING IN TUNE WITH ADVANCES IN COMPUTING AND EQUIPMENT TECHNOLOGY WILL BE IMPORTANT TO STAY COMPETITIVE AND PROFITABLE.

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will be important to stay competitive and profitable.”

Product and system performance will continue to improve as the energy-efficient building trend continues. “In the next 25 years, I expect to see ... a continuation of the move to more energy-efficient systems including smart glass technology, keeping up with the rising demand to combat higher energy costs throughout the world,” Haber says.

Glaziers expect product advancement to continue in areas beyond energy performance as well. They forecast larger lites, more structural glass applications and increased use of curved glass. And, they expect to see advanced glazing products that have yet to be developed.

“I expect to see continued innovation in the products and more diversification. There has been a trend to do more unitized curtain wall, and I expect to see that, along with the use of more innovative materials—jumbo glass, better thermal performance, etc.,” says Ajay’s Stathopoulos.

TOP 50 GLAZIERS

LEGACY COMPANIES

Number of years as a Top 50 Glazier

The Top 50 Glaziers report has only been successful because of the participation of glazing firms year after year, during busy times and slow. Glass Magazine would like to recognize its Top 50 Legacy Companies, those that have appeared on the list 15 times or more.

Two companies—Harmon Inc., harmoninc.com, and Karas & Karas Glass Co., karasglass.com—have appeared on Glass Magazine’s Top 50 Glaziers list every year since its inception in 1992. Two additional companies—Giroux Glass Inc., girouxglass.com, and Walker & Laberge Co., walkerlaberge.com—have appeared 24 out of 25 times. Read more about three of these Legacy Companies on the following pages. Eight companies appeared on the list between 20 to 23 times, and 17 firms appeared between 15 and 19 times.

Five Top 50 Legacy Companies are no longer in operation; they are noted with asterisks. Four of those companies closed during the Great Recession or its aftermath. They include American Glass & Metals, ASI Ltd., Carter Glass Co., which became Janssen Glass, janssenglass.com, and Trainor Glass Co. The fifth, Heinaman Contract Glazing, ceased operations two years ago as part of an overall business transition to new ownership.

Harmon Inc. featured opposite	25
Karas & Karas Glass Co. featured on page 10	25
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*No longer in operation



Harmon Inc. glaziers working in 2016 at the 300 South Tryon-Kimpton Hotel in Charlotte, North Carolina. Photo courtesy of Harmon.

HARMON INC.

A NATIONWIDE GLAZIER EVOLVING DECADE AFTER DECADE

Harmon, harmoninc.com has been a steady presence at or near the top of Glass Magazine's Top 50 Glaziers list since 1992. However, its history goes back decades further. Harmon Glass was founded as a windshield replacement shop in downtown Minneapolis in 1949. The company expanded into building glass installations in the 1950s, and into commercial glazing in the 1970s. By the time Glass Magazine launched its first Top 50 Glaziers list in 1992, Harmon was the largest commercial glazing contractor in the United States, with 1,500 employees and more than \$250 million in annual sales.

"In 1992, Apogee Enterprises Inc., Harmon's parent company, owned two installation glazing business units. Harmon Ltd. was focused on monumental and international projects, while Harmon Inc. [the Harmon of today], concentrated on the U.S. small project glazing segment, with significant revenues in the service sector," describes Bill Kruger, Harmon's national director of preconstruction services.

In the late 1990s, Apogee sold Harmon Ltd. Harmon Inc. reported sales of \$66.2 million in the Top 50 Glaziers report the first year after the split. However, the company grew quickly.

By 2000, Harmon Inc. reached \$125.4 million in sales; by 2007, \$290 million, according to Top 50 Glaziers surveys.

This growth coincided with a major shift in company strategy "to a more project-orientated focus," Kruger describes. This strategy continued throughout the early 2000s and 2010s, leading to a final push in 2012, when Harmon divested fully from the service business.

Additionally, the company began to implement a national strategy. "Harmon has worked to develop a consistent national strategy and culture, while leveraging our local relationships," Kruger says. "We now employ centralized

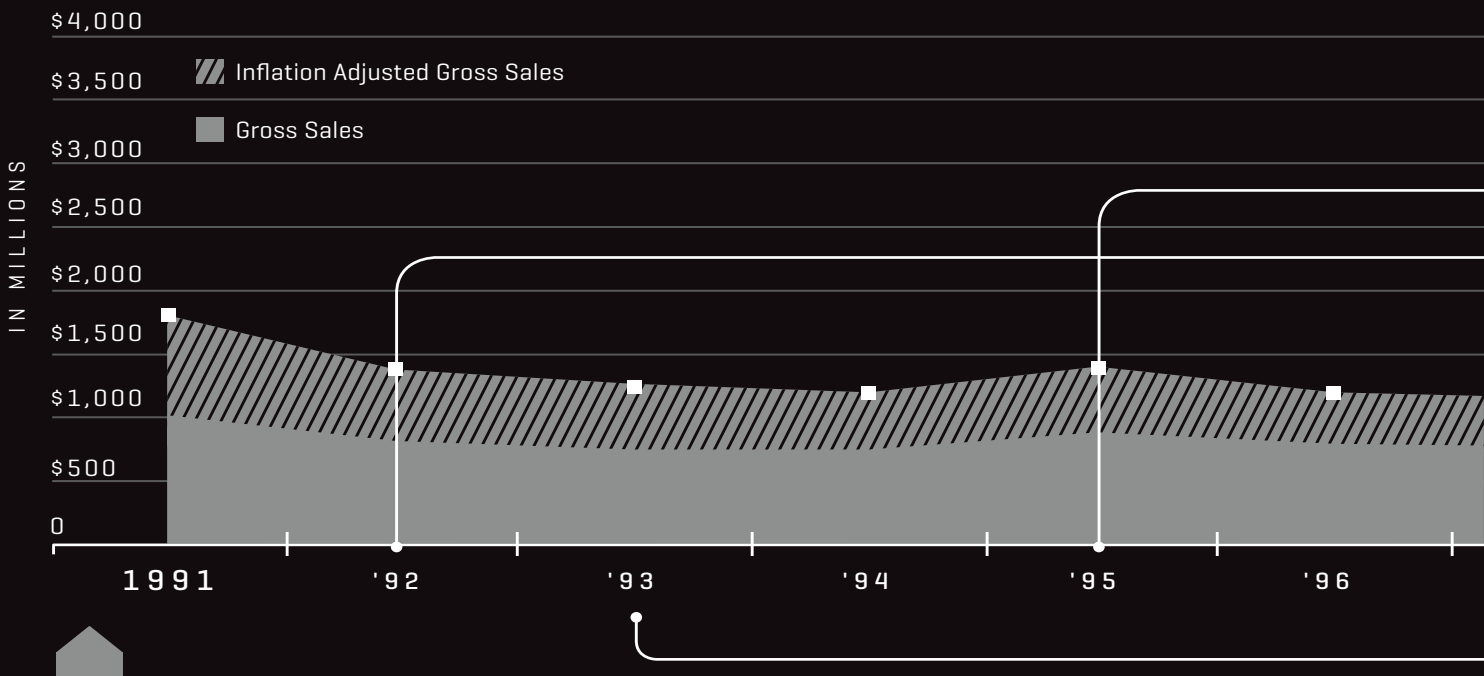
preconstruction services, engineering and manufacturing to better leverage our resources and drive better execution."

Even in the face of major changes at the company and challenges in the construction industry itself, Harmon has remained a leading player in the U.S. glazing market. The company ranked in the top five of every Top 50 Glaziers report, and ranked No. 1 in 14 of those reports.

"Harmon's major accomplishment over the last quarter century is our ability to adapt to the ever-changing demands of the economy ... while providing fulfilling career opportunities to our employees," Kruger says.

25 YEARS OF TOP 50 GLAZIERS

COMBINED GROSS SALES FOR TOP 50 GLAZING COMPANIES



TOP 50 PEAKS AND VALLEYS

This chart presents Top 50 Glaziers gross sales and inflation adjusted gross sales from 1991-2016, from the 1992-2017 Glass Magazine Top 50 reports. The inflation adjusted sales are based on March 2017 currency values.

Combined non-inflation-adjusted gross sales for Top 50 Glaziers hovered at just under \$1 billion in the 1990s. The market

experienced steady growth in the late 1990s and early 2000s, increasing 60 percent from \$753 million in 1997 to \$1.2 billion in 2002.

After a slight decline in sales in 2003 and 2004, the U.S. glazing market began to heat up during the mid-2000s, with sales experiencing steep year-over-year increases, according to Top 50 sales figures. Gross sales more than doubled for Top 50

companies from 2004 to 2008, rising from \$1.1 billion to \$2.9 billion. Then the Great Recession hit. The market plummeted by nearly 40 percent from the 2008 peak to its lowest point in 2011, when Top 50 gross sales once again fell below \$2 billion.

The glazing market made slow year-over-year gains in 2012 and 2013 before experiencing more meaningful expansion in 2014. In this year's report,

documenting 2016 market performance, Top 50 Glaziers reported combined gross sales of \$3.79 billion, topping the pre-recession peak for the second time.

Source: Glass Magazine's Top 50 Glaziers Annual Reports, 1992-2017. Note: Each Top 50 Glaziers annual report presents sales and trend data for the prior year.

HURRICANE ANDREW



On August 24, 1992, Hurricane Andrew roared its way across southern Florida, leaving a path of destruction. In the United States alone, the storm killed 23, left a quarter-million people temporarily homeless and caused estimated damages of \$26.5 billion, according to the National Hurricane Center.

As reported in Glass Magazine at the time, it was found during the recovery phase that window and door failure accounted for much of the damage inside the building envelope. As the South Florida Building Code was revised to account for impact resistance from windborne debris, it became clear that glass and glazing would play a major part in establishing new construction standards.

“In 1992, Hurricane Andrew changed the way the industry looked at fenestration systems,” said Joe Schiavone, director of sales for C.R. Laurence Co., crl-arch.com, in an April 2017 Glass Magazine article about impact glazing systems. Photo by the U.S. National Weather Service.

'97 '98 '99 2000 '01 '02 '03

GREEN BUILDING AND LEED

The construction industry experienced a pivotal moment when Rick Fedrizzi, David Gottfried and Mike Italiano founded the U.S. Green Building Council in 1993. Their mission was, and is, to “promote sustainability-focused practices in the building and construction industry.” Nonprofits and firms cooperated to create a building rubric that was eventually codified as

Leadership in Energy and Environmental Design. LEED is now an international certification program that provides standards for sustainable building and design.

For the glass industry, green building has meant innovation. Energy-efficient building codes demand better performing products, and the industry has responded with solutions ranging from better coatings and more energy-

efficient glazing systems, to dynamic glasses and sun control devices. “There’s a compelling story to tell about the innovation in our industry and how the latest glass products can be used to enhance energy efficiency in buildings,” said Chris Dolan, director of marketing, Guardian Glass North America, guardianglass.com, in Glass Magazine’s October 2013 issue, which focused on energy efficiency in the industry.

“

THERE’S A COMPELLING STORY TO TELL ABOUT THE INNOVATION IN OUR INDUSTRY AND HOW THE LATEST GLASS PRODUCTS CAN BE USED TO ENHANCE ENERGY EFFICIENCY IN BUILDINGS.

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OKLAHOMA CITY BOMBING

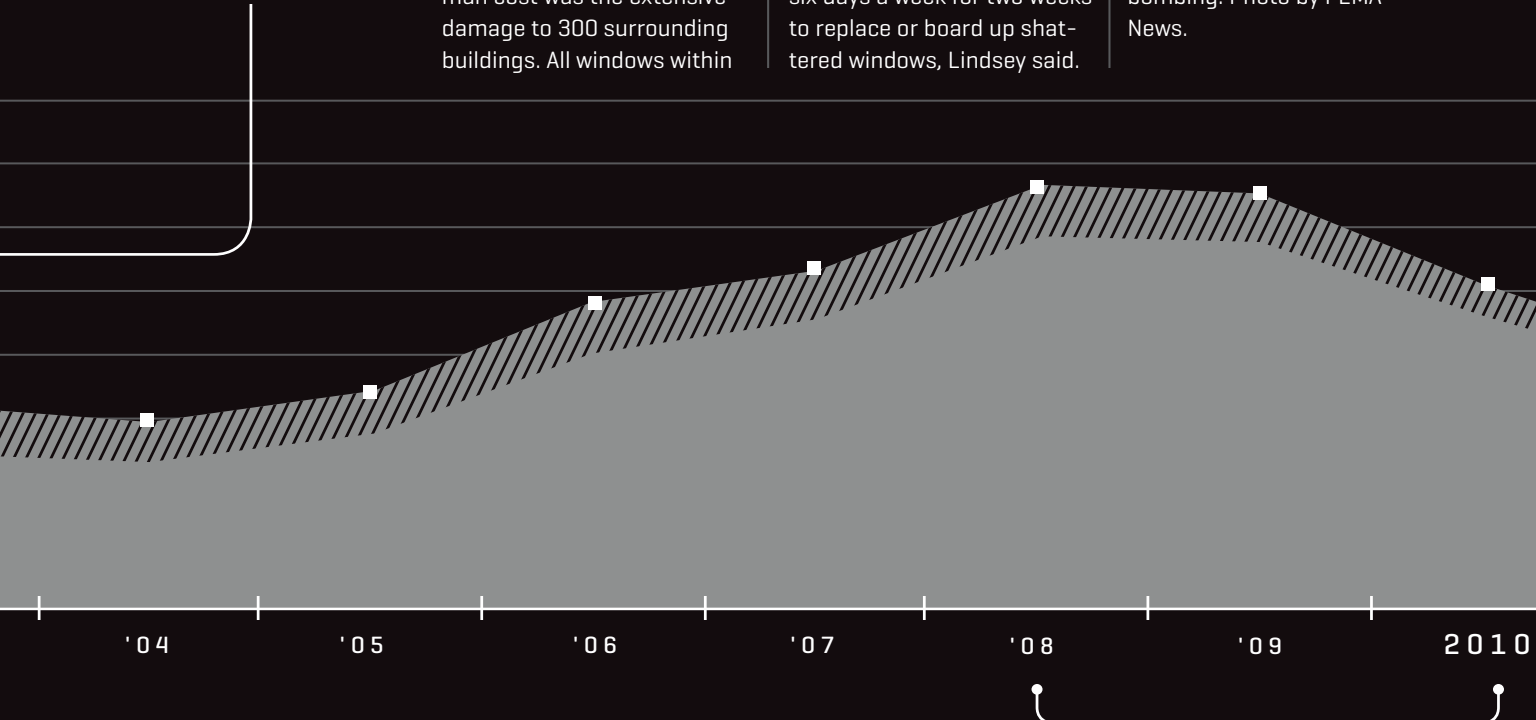


On the morning of April 19, 1995, at 9:02 a.m., a Ryder truck carrying a deadly homemade bomb exploded in front of the Alfred P. Murrah Building in downtown Oklahoma City. The bombing killed 168, including 19 children, and injured hundreds more. Added to the human cost was the extensive damage to 300 surrounding buildings. All windows within

one and a half blocks were affected. Tim Lindsey, then working for Central Glass & Mirror, centralglass.com, a glass company based in downtown Oklahoma City, recounted in *Glass Magazine* his company's efforts to repair buildings within the 2-mile blast radius. Employees worked 12 hours a day, six days a week for two weeks to replace or board up shattered windows, Lindsey said.

For the glass and glazing industry, Oklahoma City's legacy was impact glazing. After the attack, building security standards were enacted that required, among other things, blast-resistant safety measures for windows.

Pictured: Search and rescue workers gather at the scene of the Oklahoma City bombing. Photo by FEMA News.



9 / 11



Writing for *Glass Magazine* in November 2001, Paul Doherty, currently president and CEO of The Digit Group, thedigitgroupinc.com, a city planning solutions company, analyzed the devastation of the Sept. 11, 2001, attacks, and its meaning for the construction industry. "This attack has now forever changed our perceptions as a country regarding safety, security and what the design

of buildings represents to us as a people." In many ways, his predictions came true, and the glass and glazing industry was tasked with responding to the events by innovating new safety and security glazing.

"The need to better protect our civilians and facilities became apparent" after the 9/11 attacks, said Andy Canter, president of Ridgeview Glass Inc., ridgeviewglass.com, in a recent interview. "As glass comprises a large percentage of a building's skin system,

blast glass and aluminum systems were required. We were behind as a nation in regard to this product, but now it would be in the forefront of our industry. ... We had to learn the requirements of such systems, from engineering through installation, overnight, to meet the changing needs of construction."

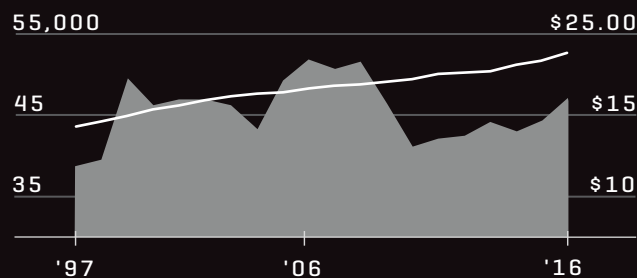
Pictured: Debris on surrounding roofs at the site of the World Trade Center. Photo by Andrea Booher, FEMA News.

EMPLOYMENT AND WAGES

The U.S. Bureau of Labor Statistics offers employment and wage data for all U.S. glaziers going back to 1997. The number of working glaziers ranged from a low of 38,450 in 1997 to a high of 51,990 in 2006. Glazier employment increased quickly during the early years of the survey, before experiencing a

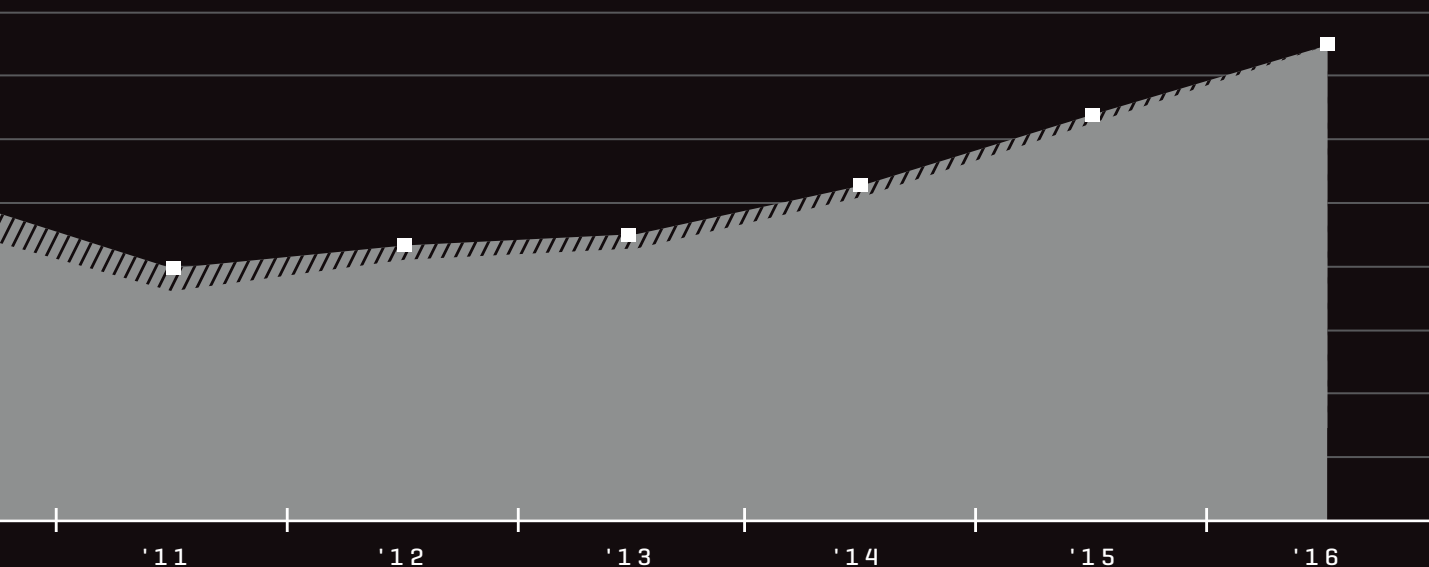
gradual falloff during the early 2000s. Employment rebounded from 2004 to 2008, rising 20 percent. However, during the Great Recession, U.S. glaziers lost nearly 11,000 jobs. While glazier employment has experienced gains since 2010, it has regained just over half the jobs it lost during the recession.

Looking at wages, the mean hourly salary for



U.S. contract glaziers has increased at an average rate of 2.8 percent annually from 1997 to 2016, rising from \$13.40 to \$22.72.

— Mean hourly salary
■ Employment



THE GREAT RECESSION... AND RECOVERY

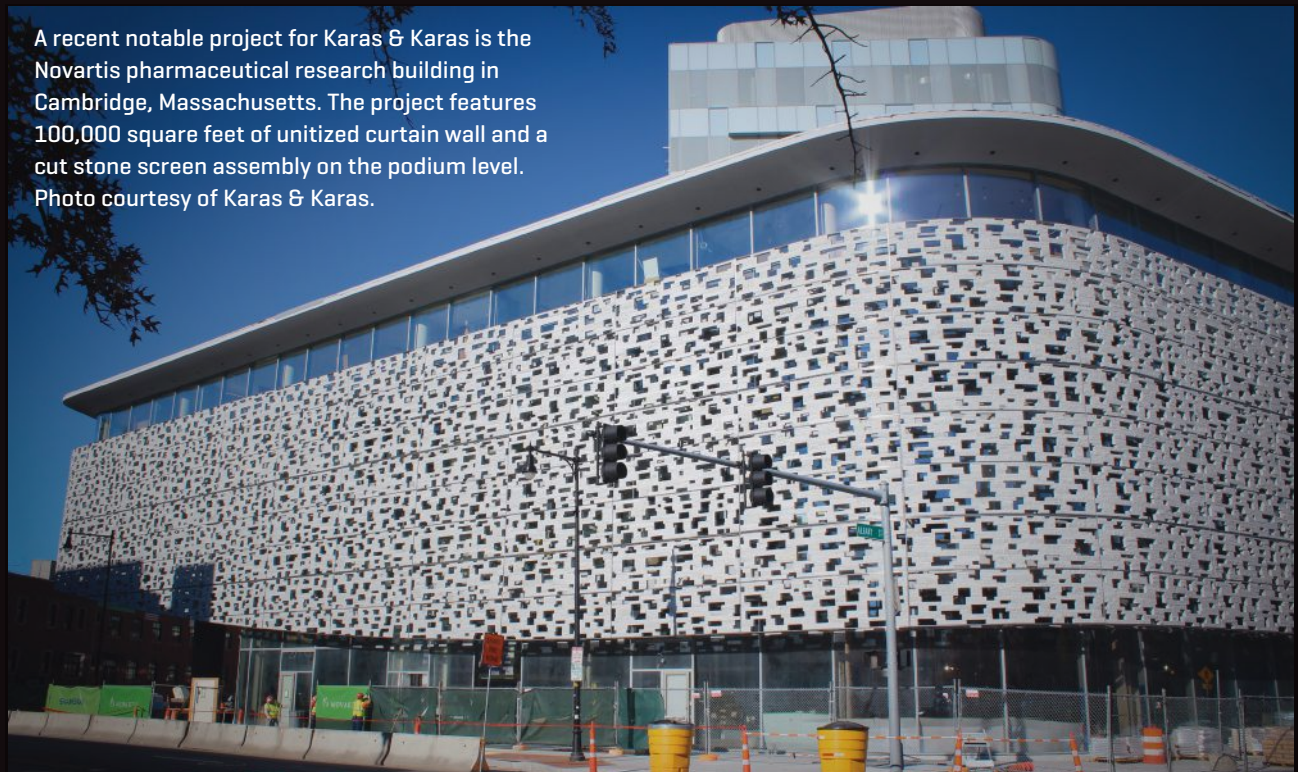


On the cover of Glass Magazine's January 2009 issue is the statement, "We'll use adversity to our advantage," a sentiment that accurately characterizes the glass and glazing industry's reaction to the Great Recession. The downturn, regarded as the worst since the Great Depression, began in December 2007 after the housing market collapse, and changed the glass industry—and

American industry—forever, according to industry sources. During the downturn, numerous glass companies shuttered their doors and industry employment numbers fell. Responding to a Glass Magazine survey published in January 2010, 71 percent of industry companies reported profit decreases as they saw backlogs disappear, commercial construction come to a halt, and institutional and governmental projects dry up.

This perfect storm required some creative solutions, and many in the industry rose to the challenge. During the long and bumpy recovery, companies redefined themselves and their services by investing in new equipment, producing more multifunctional products, considering new partnerships and expanding their marketing presence to online platforms.

A recent notable project for Karas & Karas is the Novartis pharmaceutical research building in Cambridge, Massachusetts. The project features 100,000 square feet of unitized curtain wall and a cut stone screen assembly on the podium level. Photo courtesy of Karas & Karas.



KARAS & KARAS

FROM BOOTSTRAP BEGINNINGS, A STORY OF EVOLUTION AND ADVANCEMENT

The history of Boston-based Top 50 Glazier Karas & Karas Glass Co., karasglass.com, can be traced back about 100 years, says Leo Karas, company treasurer and former president. “My father came to this country in 1912,” he says. “Early on, someone told him he could deglaze wood frames and then sell the glass. He started hauling glass through the streets of east Boston hollering, ‘I’ll replace your glass!’ That’s how the company started.”

Karas & Karas was officially incorporated in 1924 and has grown into a leading regional glass company with a wholesale division and contract glazing business.

Karas & Karas’ glazing segment, specifically, experienced impressive growth in the last 25 years. The company reported glazing sales of \$4.2 million in the 1992 Glass Magazine Top 50 Glaziers survey. This year, Karas & Karas’ sales topped \$90 million, and it achieved the No. 10 rank.

Karas & Karas’ decades of success hinged upon its ability to endure tough times, Karas says. The company survived the Great Depression, World War II, the 1973 oil crisis, downturns of the 1980s and 1990s, and the Great Recession.

“We did go through some tough times over the years, but we’ve found a way to survive, and to survive with great strength,” Karas says.

Although, “there was a point when we considered getting out of the construction business entirely because it was so slow. This was before 1965. We consulted with the head of Pittsburgh Plate Glass at the time and he convinced us to stay in the business—he assured us that it would pick up again. And it did.”

Karas, who is now 88, began to back away from the leadership of the company in recent decades. Joey Karas, Leo Karas’ son, was appointed head of the wholesale business, and Jay Argus took the reins of the contract division. “My biggest accomplishment in this business was finding [people] who are smarter than I am to run it,” Karas says.

Since Argus took over the contract division about 25 years ago, the focus on the segment has been advancement, in terms of technology and products. Perhaps the biggest evolution is the move to unitized curtain wall. “Everything is unitized curtain wall—preassembled, pre-glazed unitized. This is the biggest change not just for us, but for everybody,” says Argus.

Looking ahead, Argus is preparing Karas & Karas for the next 25 years of advancements in glazing. “We will be adapting to new technology, hiring younger people so we can adapt to technology,” he says.

Ten years ago, Giroux Glass took on the challenging glass installation at the Grand Canyon Skywalk. The U-shaped all-glass bridge extends 70 feet from the west rim, 4,000 feet above the Colorado River. Photo courtesy of Giroux Glass.



GIROUX GLASS

TACKLING THE CUSTOM AND COMPLEX IN LOS ANGELES AND BEYOND

When Anne-Merelle Murrell purchased Los Angeles-based Giroux Glass, girouxglass.com, from Louis Giroux in 1991, the glass company employed about 10 workers and handled mostly service glass work. In 1993, when Giroux first appeared on the Glass Magazine Top 50 Glaziers list, the company reported sales of \$2.4 million.

Today, Giroux Glass employs more than 260 people at four locations. It reported sales topping \$40 million in 2016. And the company has moved far beyond its service glass beginning, playing a critical role in numerous high-profile glass projects, such as the Grand Canyon Skywalk (pictured), the Las Vegas City Center and the Staples Center in Los Angeles.

“[Louis Giroux] was in his 80s when he sold the business. He wanted to retire and not get into new things. When I took over the business, my goal was to grow the company,” says Murrell, who now serves as owner and chairman of the board.

Murrell says the company received early opportunities to jump start that growth following two Los Angeles emergencies in the early 1990s—the 1992 riots and the 1994 Northridge earthquake.

“In the Spring of 1992, we experienced the Rodney King Riot. ... Since we were one of the only companies focused on service work, we were called upon immediately,” Murrell recalls. “At midnight that first night, we got a frantic call to get to the LA Times Building

in downtown LA. By 6 a.m. the next morning, we were already doing repairs to that building, re-securing windows and making them bullet resistant on the second floor, to make the employees safer.

“Two years after the riots, another disaster, the Northridge earthquake, hit us. That’s when we really started getting into more contract work, more than just maintenance. By then, we were perfectly prepared for that,” Murrell says.

In the years that followed, Giroux Glass continued to grow and to shift its focus even further to the high-end, complex and custom business. “We are well known for owning our niche of completing the most challenging and complex projects, not for handling the largest,” says Nataline

Lomedico, CEO, Giroux Glass. “What that gained us is a team of like-minded individuals who thrive on working with challenges and on the opportunity to be part of our collaborative Giroux team.”

Giroux officials attribute much of the company’s success to its ability to evolve in the face of adversity. “Over the past 25 years of not only surviving, but growing from challenges in our industry—like the riots, earthquakes and the recession—our expertise has continually increased,” says Lomedico.

Looking ahead, the Giroux team eyes more growth and innovation. Additionally, the company is pursuing an ESOP, employee stock ownership plan, to bring the company into the next 25 years. **E**

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TOP 50
GLAZIERS

50

2017 ANNUAL
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INCLUDES
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INFORMATION
FOR THE 25TH
ANNIVERSARY

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EDITION

You asked... We listened.

The annual Top 50 Glaziers report is now presented as an Excel file!

The report includes:

- Contact information, including names, email addresses, mailing addresses, phone numbers and websites
- Three-year comparison of estimated gross annual sales
- Number and location of all offices
- Searchable database of locations
- PLUS historical market information for the special 25th anniversary edition.

Both the 2016 and 2017 reports are available for purchase in the online store at GlassMagazine.com.

NGA members receive both reports for FREE! Contact Josh Lowe, jlowe@glass.org.

TOP 50
GLAZIERS



2017 ANNUAL
REPORT

U.S. GLAZIERS REPORT INVESTMENTS AND EXPANSIONS DURING THIRD
CONSECUTIVE YEAR OF STRONG GROWTH

BY KATY DEVLIN AND NORAH DICK
CONTRIBUTIONS FROM BETHANY STOUGH

2016 MARKED THE THIRD YEAR OF ROBUST GROWTH FOR U.S. GLAZING CONTRACTORS, ACCORDING TO THE 2017 TOP 50 GLAZIERS ANNUAL REPORT, GLASS MAGAZINE'S ANNUAL SURVEY OF THE NATION'S 50 LARGEST GLAZING FIRMS. SEVENTY-FOUR PERCENT OF TOP 50 GLAZIERS REPORTED YEAR-OVER-YEAR GROWTH FROM 2015 TO 2016, AND COMBINED SALES FOR ALL TOP 50 COMPANIES REACHED \$3.79 BILLION.

Amid the strong market conditions, several glaziers announced expansions, either moving to larger facilities or adding locations. More than two-thirds reported notable capital investments, many in equipment to improve efficiency, allow for more complex fabrication, or to handle larger, heavier lites.

“We made significant investments in new CNC and field installation equipment to support growth and improve efficiency. In addition, we signed a new lease [on a facility] in Dallas to add fabrication capacity,” says Rick Cieslewicz, president of No. 29 Dynamic Glass, dynamicglass.com.

“In addition to several new trucks, our primary acquisition this year was a new PanelBuilder XYZ Model 5018 system,” says Barbara Kotsos, director

of marketing for No. 19 Giroux Glass Inc., girouxglass.com. “It represents one more impressive piece of CNC equipment for fabricating aluminum composite and metal composite materials in Giroux Glass’ San Bernardino, California, plant. The new addition, along with the installation of custom saw/feeders, will enhance our glazing projects and benefit our customers in several helpful ways.”

Other firms that announced investments include No. 35 H.J. Martin and Son, hjmartin.com, which purchased glass handling robotic equipment; No. 26 Crawford-Tracey Corp., crawfordtracey.com, which acquired equipment to handle jumbo glass lites; and No. 41 Koch Corp., kochcorporation.com, which added man lift equipment

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CRAWFORD -
TRACEY CORP.

The Lennar Foundation Medical Center is a 206,000-square-foot outpatient center on the University of Miami’s Coral Gables campus. The building’s expansive views and light contribute to the project’s goals of providing quality preventative and outpatient care for a variety of patients by focusing on their overall well-being. Designed to meet Miami’s strict building codes, the medical center features Pro-Tech 9SG LMI, a four-sided structurally glazed curtain wall system for large missile impact, manufactured and installed by Crawford-Tracey Corp., crawfordtracey.com. Viracon, viracon.com, fabricated the 1 5/16-inch laminated, insulating vision glass and 1 5/16-inch laminated, insulating spandrel glass. Kuraray, kuraray.us.com, provided the laminated glass interlayer. Perkins+Will, perkinswill.com, was the architect and OHL Arellano, ohlarellano.com, was the general contractor. Pilkington, pilkington.com/en/us, was the glass manufacturer. Photo courtesy of Crawford-Tracey Corp.



\$3.79
BILLION

NORTH AMERICAN COMBINED SALES FOR TOP 50 GLAZIERS REACHED \$3.79 BILLION IN 2016, UP 25 PERCENT FROM THE COMBINED TOTAL OF \$3.03 BILLION IN 2015.

for the jobsite and manipulators for lifting heavy glass at jobsites, plus material storage racking of various types, forklifts and more.

The investments help glaziers meet higher demand and calls for more complex systems. However, the additional equipment also eases the strain of the top-reported challenge: lack of qualified labor.

“Not unlike last year, some of the largest challenges of 2016 included finding quality new hires who fit our high expectations, especially during times of such high construction growth in our area,” says Giroux’s Kotsos.

“Finding good tradesmen and glaziers with retrofit experience continues to be a difficult but overcome-able obstacle,” says Dan Sandoval, principal, No. 43 Wind Ready Inc., windready.com.

Several companies pointed to increasing material lead times as an issue—one that is only exacerbated in the busier market. “Our biggest challenge has been managing overworked supply chains,” says Marty Trainor, vice president of preconstruction for No. 14 Ventana Build-Systems LLC, ventana.vc.

Several others reported still-low profit margins. The biggest challenge for No. 27 SPS Corp., spscorporation.com, was “maintaining an acceptable margin level in a highly competitive market. While there has been a good amount of work available, the selling price has been slow to come up, keeping margins fairly low,” says Jon Clark, director of sales and estimating.

“Our largest challenge was competitors bidding with low margins that we see as professionally irresponsible,” says



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ARCHITECTURAL WALL SYSTEMS

Architectural Wall Systems, archwall.com, served as a prime subcontractor for the exterior envelope package of the new University of Iowa Voxman School of Music building in Iowa City. The new facility replaced the previous School of Music building, which was destroyed by floods in 2008.

The building is approximately 190,000 square feet and includes 150 individual rehearsal spaces, performance spaces and a 700-seat concert hall. LMN Architects, lmnarchitects.com, along with Neumann Monson Architects, neumannmonson.com, designed a custom exterior skin, which is comprised primarily of curtain wall and terracotta. Acoustic performance was a major factor in the design, which led to triple insulating units, double-glazed windows, and multiple interior sound-lock walls. The “warped” curtain wall at the east elevation presented unique challenges and, in combination with the twisted terracotta tile cladding, became a distinctive, defining feature of the exterior façade, according to AWS officials. Mortenson Construction, mortenson.com, was the construction manager. Viracon, viracon.com, fabricated the glass. Wausau Window & Wall Systems, wausauwindow.com, supplied the glazing systems, including its Superwall, and Invision 7250 and 7250I-UW Unitized Curtainwall. The project achieved LEED Gold certification. Photos by Angela Sleep Photography.

Andy Canter, president of No. 46 Ridgeview Glass Inc., ridgeviewglass.com. “We are still seeing this issue in 2017, but to a lesser extent, as the abundance of projects are limiting the number of competitors bidding on projects.”

Additional challenges included managing complex design-assist projects, tight construction schedules and rising operational costs.

The following Top 50 Glaziers annual report presents an in-depth look at the U.S. contract glazing market, including a statistical representation of the market on pages 76-79; top challenges and supplier solutions on pages 80-81; and the list of the Top 50 Glaziers in the United States, based on 2016 sales volume, pages 64-75. The report also highlights high-profile projects from Top 50 Glazier companies.

THREE NEW COMPANIES JOINED THE TOP 50 GLAZIERS LIST IN 2016

No. 7—GMP Consulting & Glazing Contractors Inc., Miami
gmpglazing.com

No. 23—Above All Store Fronts Inc.
Hauppauge, New York
aboveallstorefronts.com

No. 28—Kensington Glass Arts
Ijamsville, Maryland
kensingtonglass.com

ONE COMPANY CLOSED LOCATIONS IN 2016

No. 9—Binswanger Glass,
binswangerglass.com, closed
two locations, in Roanoke and
Harrisonburg, Virginia.

FOUR COMPANIES OPENED LOCATIONS IN 2016

No. 29—Dynamic Glass,
dynamicglass.com, opened a Dallas
office with five employees.

No. 38—Egan Co., eganco.com,
relocated operations from Plymouth
to Champlin, Minnesota. The larger
space allows for more capacity in the
InterClad fabrication shop.

No. 41—Koch Corp. [Strong Tower
Construction], kochcorporation.
com, added a new fabrication
factory in Louisville, Kentucky, which
employs approximately 18 full-time
employees.

No. 43—Wind Ready Inc., windready.
com, completed construction on its
new location in Northwest Miami-
Dade County.

THE LIST

The annual Top 50 rankings present what Glass Magazine editors believe to be the United States' 50 largest contract glazing firms, based on sales volumes. The glazing firms are ranked within nine sales categories.

Information from 49 of the Top 50 comes directly from contract glazing firms or from financial reports from publicly traded parent companies. In cases where a company declines to provide information, we use independent sources to determine its ranking.

If your company belongs on the list, or you would like to update its information, please contact us. It is only with the cooperation of individual companies that Glass Magazine's Top 50 Glaziers rankings can be as accurate as possible. Questions or comments about this year's rankings, and requests to be included next year, can be sent to Katy Devlin at kdevlin@glass.org.



01	\$600+ MILLION	02	\$400 TO \$500 MILLION	03	\$200 TO \$300 MILLION	04
Permasteelisa North America		Enclos Corp.		Harmon Inc.		Benson Industries Inc.
www.permasteelisagroup.com Windsor, CT		enclos.com Eagan, MN		harmoninc.com Bloomington, MN		bensonglobal.com Portland, OR
Previous rank: 1 Sales: Up 12.5% U.S. locations: Seven <i>Sales for fiscal year 2016 [April 1, 2015-March 31, 2016], from parent Lixil Group Corp.'s FYE2016 Financial Results Summary.</i>		Previous rank: 2 Sales: Up from 2015 U.S. locations: 15 Full-time employees: 788 Total employees: 793		Previous rank: 3 Sales: Up 10.2% U.S. locations: 11 Full-time employees: 532 Total employees: 536		Previous rank: 4 Sales: Up 4% U.S. locations: 10 Full-time employees: 725 Total employees: 725



50

SPECIFIED
SYSTEMS INC.

The construction of Pittsburgh's Bakery Square 2.0 office building marks the completion of the major Bakery Square mixed-use development project that began in 2007 with the refurbishment of an old Nabisco Bakery building. For the 2.0 office building, Specified Systems Inc., specifiedsystems.com, engineered, fabricated and erected the glass and glazing systems, including over 35,000 square feet of Tubelite, tubeliteinc.com, storefront and curtain wall. To achieve thermal and energy performance goals set by Strada Architects LLC, stradallc.com, Specified Systems and Tubelite collaborated to deliver a custom high-performance framing system. According to Specified Systems, the team developed a large insulation cavity for the system—a custom engineered extruding casing that was set in the openings first, followed by the framing, creating a 10 1/2-inch deep system. The glass for the storefront and curtain wall is Energy Select 28 solar control low-emissivity glass from AGC Glass Co., agc-group.com. The project also features a glass-enclosed, exterior-glazed pedestrian bridge that spans a four-lane main artery and connects floors four through six of each building. The bridge is clad in Tubelite 400 Series curtain wall, with high-performance insulating glass consisting of Vitro Architectural Glass, vitroglazings.com, Solarban 70 on Starphire over Starphire ultra clear low-iron glass. W.A. Wilson Inc., wawilsonglass.com, supplied the glass. P.J. Dick Inc., pjdic.com, was the general contractor. Photo courtesy of Specified Systems Inc.

02

ENCLOS
CORP.

The 41-story Pacific Gate residential tower in San Diego features a 320,000-square-foot flowing, double-nested curvilinear façade of aluminum and glass curtain wall and window wall systems. Enclos Corp., enclos.com, was the glazing contractor for the 458-foot-tall luxury condo tower designed by Kohn Pederson Fox Associates, kpf.com. The glass for the façade, supplied by China Southern Glass, csgholding.com/en/, is 1 ¼-inch insulating glass that consists of a ⅜-inch glass lite with low-emissivity coating on the No. 2 surface, a ⅝-inch airspace, and a lite of ¼-inch low-iron glass. The aluminum material for the window wall, curtain wall and podium units was fabricated and assembled in Thailand by Envelex, www.envelex.com. The owner/developer and the general contractor was Bosa Development Corp., bosadev.com, and the façade consultant was Curtainwall Design Consulting, cdc-usa.com. Photo courtesy of Enclos Corp.



05

Walters & Wolf*

waltersandwolf.com
Fremont, CA

Previous rank: 5
U.S. locations: Seven
Full-time employees: 700
Total employees: 700
**rank based on sales estimate*

06

\$100 TO \$200
MILLION

W&W Glass LLC

wvglass.com
Nanuet, NY

Previous rank: 6
Sales: Up 33.3%
U.S. locations: One
Full-time employees: 225
Total employees: 225

07

GMP Consulting & Glazing Contractors Inc.

gmpglazing.com
Miami, FL

Previous rank: N/A
Sales: Up 102.9%
U.S. locations: Two
Full-time employees: 85
Total employees: 85

08

Architectural Glass & Aluminum

aga-ca.com
Livermore, CA

Previous rank: 7
Sales: Up 20.4%
U.S. locations: Three
Full-time employees: 68
Total employees: 286

09

Binswanger Glass

binswangerglass.com
Memphis, TN

Previous rank: 8
Sales: Up 31.7%
U.S. locations: 66
Full-time employees: 945
Total employees: 969

10

\$50 TO \$100
MILLION

Karas & Karas Glass Co.

karasglass.com
Boston, MA

Previous rank: 11
Sales: Up 41.6%
U.S. locations: Two
Full-time employees: 85
Total employees: 143



11

seele Inc.

seele.com
New York, NY

Previous rank: 19
Sales: Up 118.9%
U.S. locations: Two
Full-time employees: 26
Total employees: 91

12

Alliance Glazing Technologies

allianceglazing.com
Romeoville, IL

Previous rank: 10
Sales: Up 18.9%
U.S. locations: Three
Full-time employees: 250
Total employees: 250

13

Massey's Plate Glass & Aluminum Inc.

masseysglass.com
Branford, CT

Previous rank: 13
Sales: Up 10.0%
U.S. locations: Three
Full-time employees: 200
Total employees: 200

18

Admiral Glass Co.

admiralglass.net
Houston, TX

Previous rank: 12
Sales: Down 27.9%
U.S. locations: Three
Full-time employees: 350
Total employees: 350

19

Giroux Glass Inc.

girouxglass.com
Los Angeles, CA

Previous rank: 18
Sales: Up 13.8%
U.S. locations: Four
Full-time employees: 258
Total employees: 261



11

S E E L E

An all-glass entrance canopy greets visitors to 432 Park Ave. in New York City, which, at 1,396 feet, is the tallest condominium tower in the Western hemisphere. For the canopy, seele, seele.com, supplied and installed oversized laminated glass panes, including four 20-foot by 10-foot pieces, and three 20-foot by 4-foot pieces. The laminated assemblies consist of four lites of 12-millimeter heat-strengthened low-iron glass with SentryGlas interlayers from Kuraray, kuraray.com. The large canopy panes are supported on 22-foot long glass beams that cantilever out from the building. The glass beams consist of five lites of fully tempered 19-mm clear glass, with SentryGlas interlayers. Titanium-encased stainless steel fins were laminated into the beams, according to seele officials. The entrance is highlighted through LED lights that have been integrated into titanium channels in the laminated glass beams. The glazed entrance vestibule also features four double-leaf swing doors. The design architect was Rafael Vinoly, vinoly.com, and the executive architect was SLCE Architects, slsearch.com. The contractor was LendLease Construction LMB Inc., lendlease.com. Photo courtesy of seele.



14

Ventana Design-Build Systems LLC

ventana.vc
Chicago, IL

Previous rank: N/A
Sales: Up 8.3%
U.S. locations: Five
Full-time employees: 41
Total employees: 41

15

Kovach Building Enclosures

kovach.net
Chandler, AZ

Previous rank: 9
Sales: Down 23.6%
U.S. locations: Five
Full-time employees: 300
Total employees: 300

16

TSI Corps.

tsicorporations.com
Upper Marlboro, MD

Previous rank: 15
Sales: Up 11.2%
U.S. locations: One
Full-time employees: 47
Total employees: 200

\$40 TO \$50 MILLION

17

Haley-Greer Inc.

haleygreer.com
Dallas, TX

Previous rank: 16/17
Sales: Up 20.0%
U.S. locations: Two
Full-time employees: 145
Total employees: 145





35

H. J. MARTIN AND SON

The Acuity Insurance Corporate Headquarters Expansion and Parking Structures project in Sheboygan, Wisconsin, more than doubles the size of the company's headquarters, bringing it to nearly 1 million square feet. The \$170 million project consists of two new building additions, a pair of parking structures and enhancements to the existing building. H.J. Martin and Son, hjmartin.com, served as glazing contractor for the expansion, which features both Duratherm, durathermwindow.com, wood curtain wall and punched window systems, and Kawneer Co., kawneer.com, aluminum curtain wall. Oldcastle BuildingEnvelope, obe.com, fabricated the high-performance glass, with Solarban 60 solar control low-emissivity glass from Vitro Architectural Glass, vitroglazings.com. The architect was Eppstein Uhen Architects, eua.com, and the general contractor, Mortenson Construction, mortenson.com. Photo courtesy of H.J. Martin and Son.



20

Ajay Glass Co.

ajayglass.net
Canandaigua, NY

Previous rank: 20
Sales: Up 22.7%
U.S. locations: Two
Full-time employees: 120
Total employees: 200

21

Tower Glass Inc.

towerglass.com
Santee, CA

Previous rank: N/A
U.S. locations: Two
Full-time employees: 140
Total employees: 200

22

\$30 TO \$40
MILLION

Glass Solutions Inc.

gsichicago.com
Elmhurst, IL

Previous rank: N/A
Sales: Up 16.7%
U.S. locations: One
Full-time employees: 35
Total employees: 97

23

Above All Store Fronts Inc.

aboveallstorefronts.com
Hauppauge, NY

Previous rank: N/A
Sales: Up 20.7%
U.S. locations: One
Full-time employees: 170
Total employees: 170

24

Architectural Wall Systems LLC

archwall.com
Clive, IA

Previous rank: N/A
Sales: Down 35.9%
U.S. locations: Two
Full-time employees: 106
Total employees: 106

25

Cherry Hill Glass Co.

cherryhillglass.com
Branford, CT

Previous rank: 21/22
Sales: Up 6.7%
U.S. locations: One
Full-time employees: 140
Total employees: 160

26

Crawford-Tracey Corp.

crawfordtracey.com
Deerfield Beach, FL

Previous rank: 29/30
Sales: Up 39.7%
U.S. locations: Two
Full-time employees: 110
Total employees: 110

27

SPS Corp.

spscorporation.com
Apex, NC

Previous rank: 23/24
Sales: Down 4.8%
U.S. locations: Two
Full-time employees: 82
Total employees: 82

28

\$20 TO \$30
MILLION

29

Kensington Glass Arts

kensingtonglass.com
ljamsville, MD

Previous rank: N/A
U.S. locations: One
Full-time employees: 135
Total employees: 135

Dynamic Glass

dynamicglass.com
Houston, TX

Previous rank: 31
Sales: Up 27.1%
U.S. locations: Two
Full-time employees: 133
Total employees: 133

30

Metropolitan Glass Inc.

metroglass.com
Denver, CO

Previous rank: 36
Sales: Up 68.7%
U.S. locations: One
Full-time employees: 90
Total employees: 90

31/32

Pacific Glazing Contractors

pacificglazing.com
Morgan Hill, CA

Previous rank: N/A
U.S. locations: Two
Full-time employees: 90
Total employees: 100



44

M G M C G R A T H
A R C H I T E C T U R A L
G L A S S &
G L A Z I N G

The new 38-acre campus for Anytime Fitness in Woodbury, Minnesota, features a glass-clad 80,000-square-foot three-story office building, maximizing daylighting in the open-concept work environment. MG McGrath Architectural Glass & Glazing, mgmcgrath.com, served as the project's glazing contractor, installing Kawneer, kawneer.com, 1600 curtain wall at the building's main entry, and multi-story south-facing radiused curtain wall, overlooking the patio and at entry points in two locations on the building. The company also installed aluminum storefront framing at the punched opening on the first and second floors of the east and west sides of the building, and glass handrails on the exterior of the main floor and second floor patios. The glass, fabricated by Oldcastle BuildingEnvelope, obe.com, is 1-inch insulating with Guardian Glass, guardianglass.com, SuperNeutral 68 low-emissivity coating. Guardian SuperNeutral 54 was used on the south-facing curtain wall. The interior features dormakaba, dormakaba.com, glass sliding doors at multiple locations, as well as glass walls and interior glass handrails leading from the terrace level up to the main floor, and from the main floor to the second floor. All curtain wall, storefront, and door glass systems throughout the facility have a clear anodized finish. The project architect was BWBR, bwbr.com; the general contractor was D.J. Krantz Co., djkrantz.com. Photo courtesy of MG McGrath.



31/32

R&R Window Contractors Inc.

www.rrwindow.com
Easthampton, MA

Previous rank: 26
Sales: No change
U.S. locations: One
Full-time employees: 82
Total employees: 85

33

National Enclosure Company LLC

nationalenclosure.com
Ypsilanti, MI

Previous rank: 32/33
Sales: Up 24.0%
U.S. locations: Two
Full-time employees: 24
Total employees: 75

34

Progress Glass Co.

progressglass.com
San Francisco, CA

Previous rank: 25
Sales: Up 12.2%
U.S. locations: Two
Full-time employees: 106
Total employees: 106

35

H.J. Martin and Son

hjmartin.com
Green Bay, WI

Previous rank: 34
Sales: Up 29.8%
U.S. locations: Two
Full-time employees: 600 [64 in glass and glazing]
Total employees: 600

36/37

LCG Facades

lcfgacades.com
Salt Lake City, UT

Previous rank: 23/24
Sales: Down 8.0%
U.S. locations: One
Full-time employees: 145
Total employees: 145

36/37

Tepco Contract Glazing Inc.

tepcoglass.com
Dallas, TX

Previous rank: 27
Sales: Up 4.5%
U.S. locations: Three
Full-time employees: 107
Total employees: 107

38

Egan Co.

eganco.com
Brooklyn Park, MN

Previous rank: 21/22
Sales: Down 34.4%
U.S. locations: Three
Full-time employees: 80
Total employees: 80

39

Synergi LLC

synergillc.com
Hanover, MD

Previous rank: 42
Sales: Up 42.9%
U.S. locations: Three
Full-time employees: 35
Total employees: 40

40

\$10 TO \$20
MILLION

AHC Glass

ahcglassinc.com
Hayward, CA

Previous rank: 39
Sales: Up 30.1%
U.S. locations: One
Full-time employees: 72
Total employees: 75

41

Koch Corp. (Strong Tower Construction)

kochcorporation.com
Louisville, KY

Previous rank: N/A
Sales: Up 11.9%
U.S. locations: Two
Full-time employees: 26
Total employees: 75

42

Denison Glass & Mirror Inc.

denisonglass.com
Denison, TX

Previous rank: 44
Sales: Up 16.7%
U.S. locations: One
Full-time employees: 107
Total employees: 107

43

Wind Ready Inc.

windready.com
Miami, FL

Previous rank: 40
Sales: Up 4.0%
U.S. locations: One
Full-time employees: 70
Total employees: 70

44

MG McGrath Architectural Glass & Glazing*

mgmcgrath.com
Maplewood, MN

Previous rank: 37
Sales: Down 3.1%
U.S. locations: One
Full-time employees: 50
Total employees: 60

**[formerly AMG Architectural Glass & Glazing]*

45

Pikes Peak Glass Inc. and City Glass Co.

pikespeakglass.com
Colorado Springs, CO

Previous rank: 50
Sales: Up 51.5%
U.S. locations: Two
Full-time employees: 118
Total employees: 118

47

Ace Glass Construction Corp.

aceglass.net
Little Rock, AR

Previous rank: 45/46
Sales: Down 7.7%
U.S. locations: Two
Full-time employees: 107
Total employees: 142

49

A.F.I. Glass & Architectural Metal Inc.

afiglass.com
Poughkeepsie, NY

Previous rank: 49
Sales: Up 35.0%
U.S. locations: One
Full-time employees: 36
Total employees: 40

46

Ridgeview Glass Inc.

ridgeviewglass.com
Upper Marlboro, MD

Previous rank: N/A
Sales: Down 3.9%
U.S. locations: One
Full-time employees: 64
Total employees: 64

48

Palm Beach Glass Specialties Inc.

pbglass.com
West Palm Beach, FL

Previous rank: 41
Sales: Down 2.8%
U.S. locations: Two
Full-time employees: 40
Total employees: 40

50

Specified Systems Inc.

specifiedsystems.com
Canonsburg, PA

Previous rank: 35
Sales: Down 24.3%
U.S. locations: Two
Full-time employees: 31
Total employees: 64

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-Richard Freeman
OWNER, AMERICAN INSULATED GLASS
CONLEY, GA

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- Glass Washers

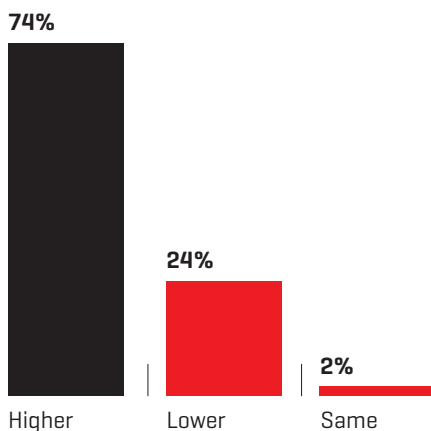


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THE MARKET

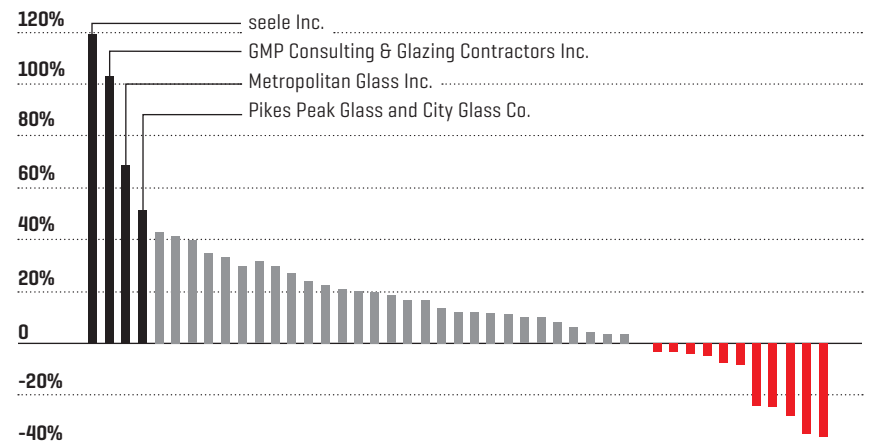
An in-depth, by the numbers look at the U.S. glazing market

HOW DID TOP 50 GLAZIERS' 2016 OVERALL SALES COMPARE TO 2015?



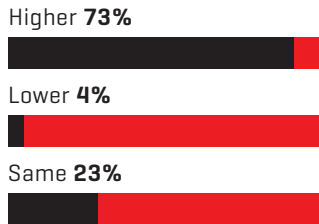
A majority of Top 50 Glaziers reported an increase in sales from 2015 to 2016. Seventy-four percent of companies reported higher year-over-year sales in 2016, with 24 percent reporting a decrease in sales. This nearly echoes the performance of companies in 2015, when 77 percent reported higher year-over-year sales and 23 percent reported a decrease in year-over-year sales.

CHANGE IN SALES FOR EACH COMPANY BETWEEN 2015 AND 2016



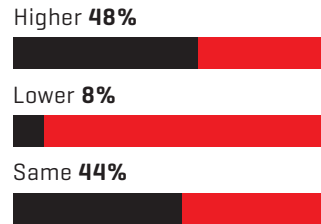
Of the companies reporting year-over-year sales increases, four companies reported sales increases of 50 percent or more, including two companies—seele Inc. and GMP Consulting & Glazing Contractors Inc.—that reported sales increases of 100 percent or more. Nine companies reported sales increases of 25 to 50 percent, and 20 companies saw sales increase 0 to 25 percent. Of the 11 companies reporting year-over-year decreases, six companies saw decreases of 10 percent or less. Five companies saw sales decline more than 20 percent.

HOW DID BID LEVELS IN 2016 COMPARE TO THE PREVIOUS YEAR?



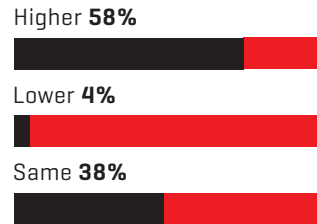
In 2016, glaziers overwhelmingly reported an increase in bid levels, with 73 percent reporting higher levels compared to the previous year.

HOW DID COMPETITION FOR PROJECTS IN 2016 COMPARE TO THE PREVIOUS YEAR?



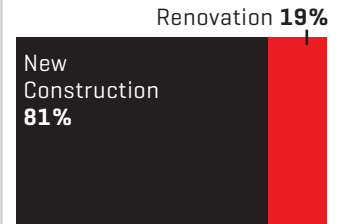
Nearly half of respondents reported higher competition for projects in 2016, up from 31 percent in last year's survey. Only 8 percent of respondents reported lower levels of competition during 2016.

HOW DID PROFIT MARGINS IN 2016 COMPARE TO THE PREVIOUS YEAR?



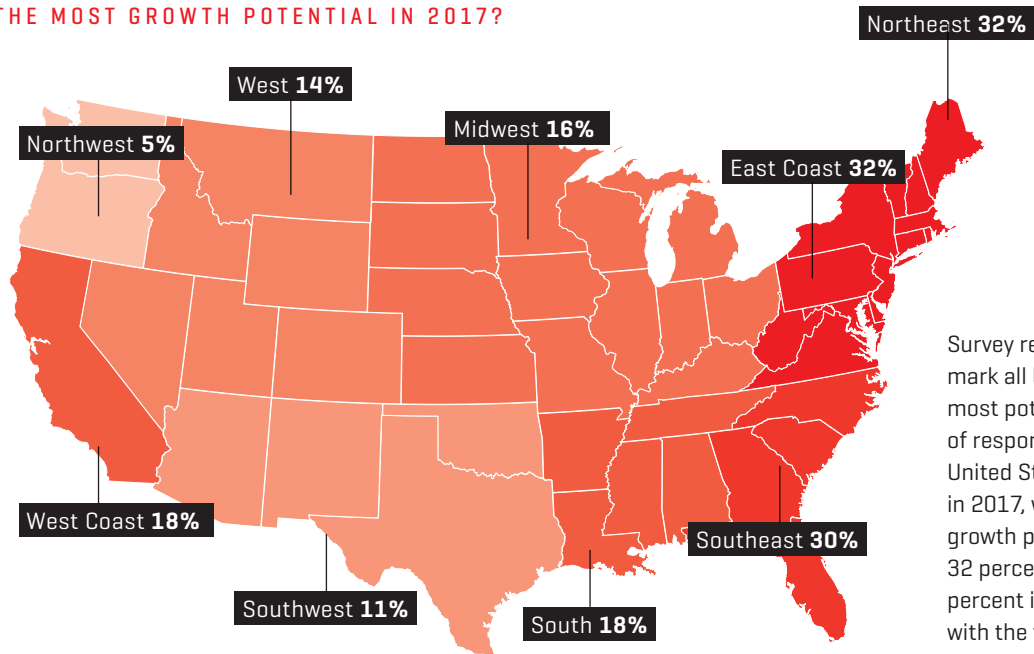
Profit margins continued to rise in 2016. Fifty-eight percent of companies reported growing margins in this year's survey, up slightly from the 56 percent of companies last year. Only 4 percent of companies reported lower margins in 2016.

NEW CONSTRUCTION VS. RENOVATION



New construction continued to dominate work for Top 50 Glaziers in 2016. On average, 81 percent of work for responding companies was new construction.

WHICH GEOGRAPHIC MARKETS OFFER THE MOST GROWTH POTENTIAL IN 2017?



Survey respondents were asked to mark all U.S. regions that offered the most potential for growth. The plurality of respondents pointed to the Eastern United States for strongest activity in 2017, with 32 percent indicating growth potential in the Northeast, 32 percent in the East Coast and 30 percent in the Southeast. The regions with the fewest votes for potential growth in 2017 were the Northwest (5 percent), Southwest (11 percent) and West (14 percent).

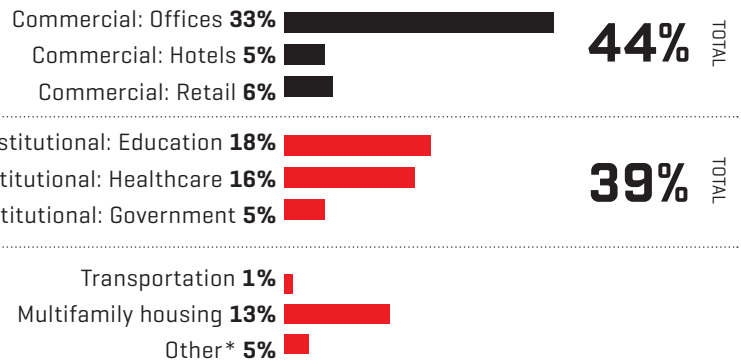
TOP 50 GLAZIERS,
BY SALES VOLUME

(in millions)

	2016	2015
\$600 or more	1	0
\$500-\$600	0	1
\$400-\$500	1	0
\$300-\$400	0	1
\$200-\$300	3	2
\$100-\$200	4	2
\$50-\$100	6	6
\$40-\$50	6	4
\$30-\$40	7	5
\$20-\$30	11	11
\$10-\$20	11	17

Back-to-back years of growth has led to upward movement of companies in the Top 50 Glaziers sales categories. Nine U.S. glazing companies reported sales topping \$100 million in 2016, up from six companies in 2015, and two new sales categories appeared at the top of this year's list, \$600 million or more and \$400-\$500 million. While the \$50-\$100 million category held steady at six companies, the \$40-\$50 million category increased from four companies to six, and \$30-\$40 million increased from five companies to seven.

INSTITUTIONAL VS.
COMMERCIAL



On average, 44 percent of work for Top 50 Glaziers in 2016 was commercial and 39 percent institutional. By specific segment, office construction led work for glaziers, at 33 percent. The next highest segment was education at 18 percent, followed by healthcare at 16 percent and multifamily at 13 percent.

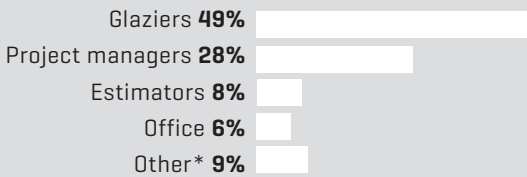
LABOR SHORTAGE

How has your company successfully recruited, hired or trained employees in the last year?

“WE FOCUSED ON DEVELOPMENT FROM WITHIN, INVESTING HEAVILY IN ADVANCED TRAINING FOR OUR EXISTING EMPLOYEES.”

—Colleen Sadder, marketing, No. 44 MG McGrath Architectural Glass & Glazing, mgmcgrath.com.

WHAT POSITIONS WERE MOST DIFFICULT TO FILL?



*including draftsmen, foremen, qualified engineers (P.E.) and experienced sales staff.



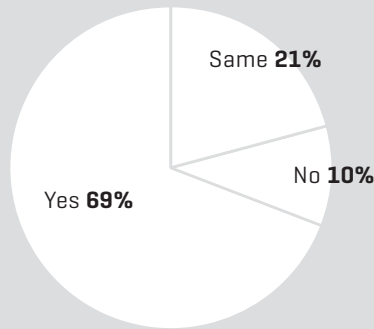
“We have developed our own in-house training program and tied wages to training, attendance and performance. We are in a non-union market. This has helped stabilize our workforce and improve quality.”

—Ted Derby, business development manager, No. 36/37 LCG Facades, lcgfacades.com.

“We have developed new written and visual materials for internal use and to use in recruiting and hiring new employees. We have increased our use of LinkedIn, Facebook, Instagram and other social media to promote our work and our company culture.”

—William C. Keen, president, No. 36/37 Tepco Contract Glazing Inc., tepcoglass.com

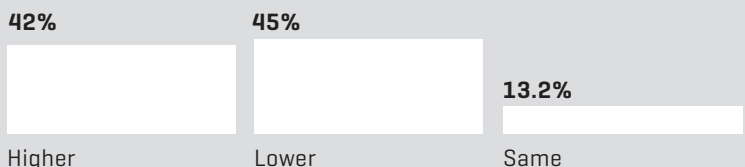
DID YOU HAVE MORE DIFFICULTY FINDING WORKERS IN 2016 COMPARED TO THE PREVIOUS YEAR?



“VENTANA HAS DEVELOPED RELATIONSHIPS WITH A LOCAL UNIVERSITY THAT HAS PRODUCED MANY TALENTED PROFESSIONALS.”

—Marty Trainor, vice president of preconstruction, No. 14 Ventana Design-Build Systems LLC, ventana.vc.

HOW DID EMPLOYMENT LEVELS IN 2016 COMPARE TO THE PREVIOUS YEAR?



SUPPLIER SOLUTIONS

Advice from glass and metal suppliers on the top challenges facing contract glaziers

Challenge

01

FINDING AND TRAINING WORKERS

The skilled worker shortage once again tops the list of challenges for glazing contractors, suppliers say. Suppliers point to a number of solutions to help ease the burden of the ongoing labor shortage, including expanding recruitment, incorporating industry-developed training tools, partnering with suppliers and improving efficiency.

“Establishing a consistent program that utilizes industry documented training tools, such as [American Architectur-

al Manufacturers Association’s, aamanet.org,] Fenestration Masters, may help minimize these challenges. Clear and accurate installation instructions, and support from suppliers also help expedite the learning and minimize inconsistencies,” says Mary Avery, vice president of marketing, Tubelite Inc., tubeliteinc.com.

“In lieu of hiring additional help, increasing effectiveness and efficiency of current staff is vital. A viable way to achieve productivity improvements while decreasing risk is to partner with familiar and proven suppliers. A shared history of expectations, project management and communication protocol minimizes unexpected occurrences that can derail and consume staffing resources,” says Seth Madole, director of sales operations, Viracon, viracon.com.



Challenge

02

JOB SITE MANAGEMENT AND SCHEDULING

The stronger construction market creates additional challenges of managing resources, jobsites and schedules. Supplier partnerships can ease the strain of the busier conditions, sources say.

“Glazing contractors should build strong relationships with reliable glass fabricators who can be counted on to deliver what they promise as well as provide high quality products, short lead times, and flexible transportation options. The fabricators should be their ‘easy button,’” says John Bush, vice president and general manager, Fabrication Division, GGI, generalglass.com.

“At Wausau, we’re providing project management on every project, so our customers don’t have to spend time managing us. We are actively involved in helping achieve their schedule and goals. We don’t need to add to that workload. It’s our goal to help them succeed,” says Keith Lindberg, regional sales manager, Wausau Window and Wall Systems, wausauwindow.com.

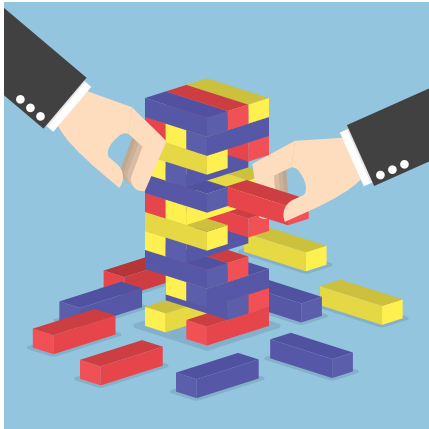
Challenge

03

RISK MANAGEMENT

Risk management remains a top concern for glaziers. Collaboration among all project team members throughout the process can help to reduce the risks for the glazing contractor, suppliers say.

“Partnering early in the contract process allows for improved communication and understanding of expectations of all parties. Continuing open communications and documentation of decision points throughout the project will help avoid unexpected consequences later,” says Viracon’s Madole.



Challenge

04

COMPLEX AND SPECIALTY GLASS INSTALLATION

Designers seek to push the limits of what’s possible with glass in and out of the building, and suppliers continue to develop product solutions to meet those demands. Glaziers are thus tasked with not only educating themselves on product advancements, but also with safely and effectively handling installation. Suppliers recommend glaziers partner with glass, metal and equipment companies to tackle projects with complex or specialty glasses.

Installing oversized glass is one example of a more complex product installation that benefits from supplier support. “If customized equipment is needed, glaziers should consider production lead times and provide the manufacturer with all the information up front – such as load weight, hoisting capacity, dimensions and how they plan to manipulate the load. Leasing equipment may also be an option and requires similar preparation. Glaziers should allow extra time on the jobsite to get familiar with the equipment so any questions can be answered before the job is started,” says Holly Anderson, technical

sales representative, Wood’s Powr-Grip, wpg.com.

Another example is fire-rated glass. “Glaziers need to partner with a supplier that can assist them in selecting the appropriate system for their application. Beyond that, they will also need a supplier that can reconcile the difference between what has been designed and what can be achieved. Finding a trustworthy partner that wants to assist you in creating a proposal that will meet code and ensure the safety of the building’s design and its occupants, as well as meet the overall requirements of the project is paramount,” says Tim Nass, vice president of national sales, Safti First, safti.com.



ONLINE: For additional advice on these challenges and others, visit GlassMagazine.com/June2017.