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Cost of Skyscraper Glass Hits Dizzying Heights

Earlier manufacturing cutbacks create delays, add to price tag as construction rebounds

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A typical high-rise office tower can need hundreds of thousands of square feet of metal-framed glass panels. A Brookfield Property under construction in New York

A shortage of glass is taking a toll on the nation's commercial building boom, adding millions of dollars to the cost of new skyscrapers and halting some projects midway through construction.

Demand is soaring for the metal-framed glass panels, or curtain wall, used to sheath skyscrapers. Those buildings need a lot of glass—hundreds of thousands of square feet for a typical high-rise office tower.

Glass manufacturers and fabricators can't keep up. Many glass makers mothballed their operations or went out of business in 2008 and 2009, during the recession, which hit the construction industry hard.

Now, however, apartment buildings are sprouting up at their briskest pace in decades, and new office towers are rising in major markets like Manhattan at the fastest rate since the early 1990s.

Restarting idled glass factories is a costly and time-consuming process, so property developers say the current shortage could last well into next year, if not longer.

In the meantime, builders are reporting that curtain-wall prices, which have risen more than 30% in the past 18 months, are setting records.

Glass accounts for roughly one-quarter of a construction project's budget, so the extra expense can add tens of millions

of dollars to a building's cost, according to Brett Atkinson, executive vice president of Moss & Associates, a Florida-based company with 30 buildings under construction that require curtain wall.

New Hudson Facades is a glass-making business that is an offshoot of real-estate developer Related Cos., which teamed up with a specialty-metal manufacturer so as to ensure a supply of glass panels. ENLARGE

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Delays are also a problem: Several towers in San Francisco's trendy Rincon Hill neighborhood, home to some of the city's most expensive apartments, are standing bare while their builders wait for glass.



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“Nowadays, the glass guys are dictating the timetables of a project to us, instead of the other way around,” said Ralph Esposito, who oversees commercial construction by the New York office of Lend Lease Corp., one of the country's largest building contractors, with nearly 30 high-rise towers under way. “I don't think people had the leap of faith that the [real-estate] industry would be as strong as the run we're currently on.”

The glass that ends up on the outside of an office building is manufactured in giant tanks in which sand is melted at temperatures north of 2,000 degrees Fahrenheit. Long ribbons of raw glass are floated down a river of molten metal. This “float glass” is then cut into pieces, customized to order, and the panels are sent to contractors who fit them into metal frames to produce panels that meet the builder's specifications. A contractor typically installs the curtain wall on the side of a building.

Producers shut 11 out of 47 float-glass manufacturing plants in North America between 2007 and 2014, according to PPG Industries Inc., a Pittsburgh-based glass maker, as demand for glass of all kind—from building facades to auto windshields—sagged during the downturn. Building a new plant can cost hundreds of millions of dollars, PPG says, and restarting an idled line can take months because workers have to jackhammer thousands of pounds of hardened glass to remove it from melting tanks.

“Once you take one of those tanks out of commission, you can't just turn it back on,” said Glenn Miner, director of construction for PPG's flat-glass division. The downturn “affected all the suppliers in the marketplace. None of them were unscathed.”

As the glass shortage worsens, some developers are taking matters into their own hands. This summer, Related Cos., a large New York real-estate firm, got into the glass-panel manufacturing business. Teaming up with M. Cohen & Sons, a specialty-metal manufacturer, the developer, opened a \$16 million, 180,000-square-foot factory in a wooded industrial park in Linwood, Pa., near the Delaware border.

Related, which is known for glitzy properties like Manhattan's Time Warner Center, decided to open its own curtain-wall factory after waiting months for delivery of window panels intended for new apartments last year in the New York borough of Queens.

The developer needs more than 3,000 panels of architectural glass for an apartment tower it is building on Manhattan's West Side, said Bruce Beal Jr., Related's president.

The new glass company, dubbed New Hudson Façades, is producing mockups for those panels. It predicts that by next



New Hudson Facades is producing mockups for the panels set to go on the Manhattan building.

year its factory will be at full capacity, producing two million square feet of curtain wall annually.

“With the logistical issues, small number of producers and growing costs, we’d rather bet on our ability to domestically produce and control the supply” of glass, Mr. Beal said.

The glass industry is gearing back up, but progress is slow because some parts of the supply chain still haven’t recovered from the recession, said Troy Hansen, director of materials at Viracon Inc., a division of Minneapolis-based Apogee Enterprises Inc. and one of the largest fabricators of the glass panes that go into curtain wall.

“As these [float glass] plants have shut down, glass has to travel farther and farther from the raw manufacturer to our facilities,” Mr. Hansen said. “There’s definitely a future of shortage of raw glass coming.”

Viracon closed one of its three manufacturing plants, in St. George, Utah, in early 2013 amid flagging demand. In late 2014, as construction

picked up, the company rushed to bring the plant back online. Even so, Viracon told customers in July that prices would rise by as much as 12% due to shortages of float glass, a once-unusual price increase that is becoming commonplace, Mr. Hansen said.

Scott Kinter, a senior vice president in Boston with AvalonBay Communities Inc., one of the largest U.S. apartment-builders, said his team began hearing about glass-related delays about a month ago, and he expects a significant curtain-wall shortage in the fourth quarter of 2015 and into early 2016. Prices are up between 35% and 45% from 2013, he said.

“Everyone is so busy and they can’t keep up with the demand,” he said. “If I were starting a new high-rise anywhere on the East Coast today, the first thing I’d try to lock down is the glass. Then I’d pray nothing goes wrong.”