

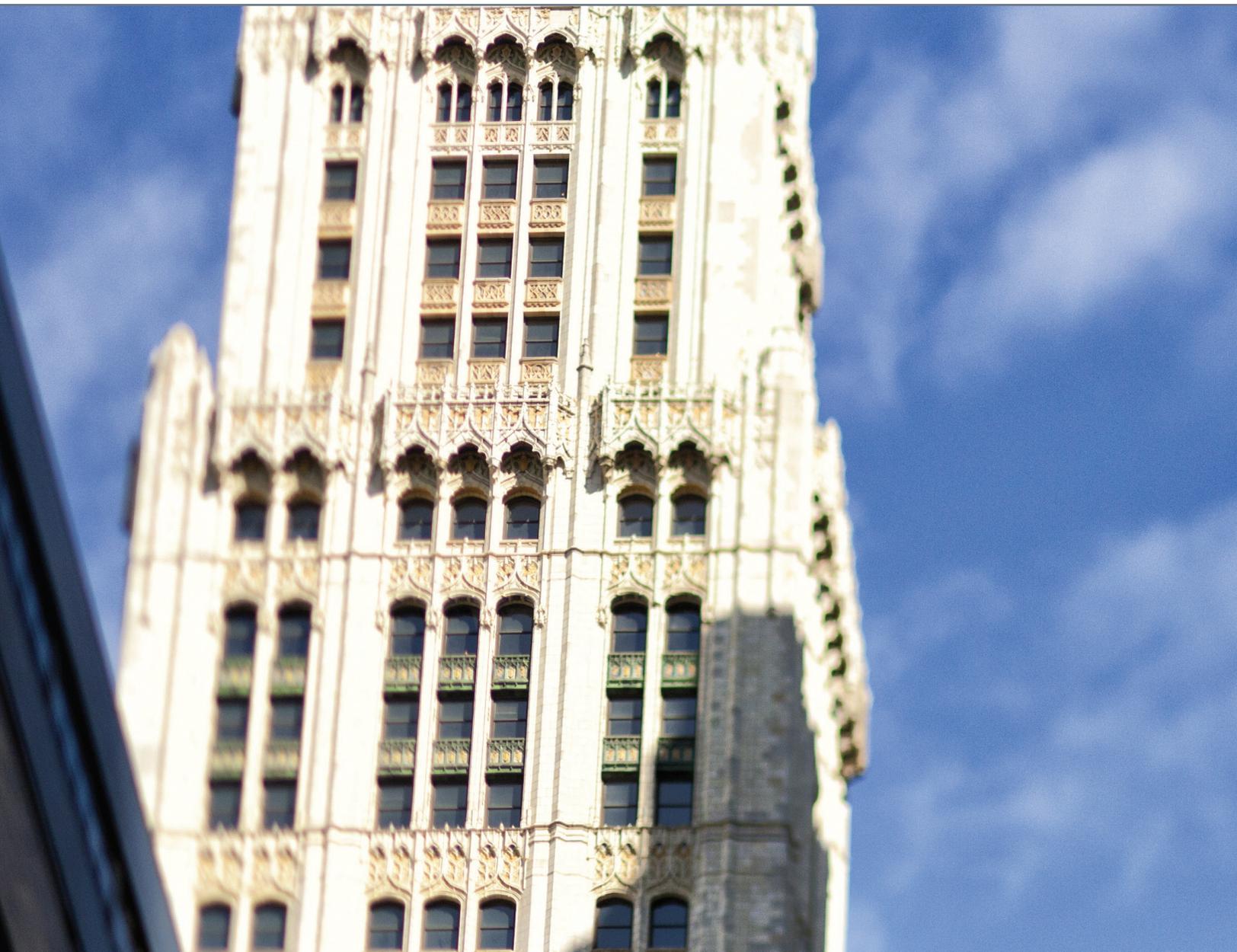


apogee**renovation**
enhancing looks | improving value | saving energy

Window and terrace door replacement

The Woolworth Tower Residences

New York, New York





The Woolworth Tower Residences offer sweeping city views from historically inspired, high-performance windows

The iconic Woolworth Tower Residences' top 30 floors are nearing completion after extensive renovations. Promising sweeping views of the city, each residence showcases new, historically inspired, high-performance windows and terrace doors from Wausau Window and Wall Systems.

The 33 luxury condominiums at 2 Park Place range from one to four bedrooms with

amenities including a private garage, fitness facility and 55-foot-long lap pool, plus wine storage for each unit and a tasting room. Residents have access to an exclusive entertainment lounge aptly named The Gilbert Lounge in honor of Cass Gilbert, the renowned architect who designed the building in 1913.





Thoughtful selection

Guided by Developer Alchemy Properties, the architectural vision of SLCE Architects, LLP and The Office of Thierry W Despont, Ltd., the Woolworth Tower Residences' interiors display Calacatta marble, Dada cabinetry, elevated ceilings and herringbone-patterned oak floors. The exteriors' polychromatic terra cotta surrounds have been restored to their former grandeur. Wausau's oversized windows make the connection between outside and in with breathtaking views.

Together with general contractor CNY Group and window contractor, Kilroy Architectural Windows, Inc., Wausau's windows and terrace doors were confirmed as the best choice to maintain the prestigious property's historic detailing, while delivering modern-day performance and easy operation.

Working with Apogee Renovation, Wausau provided Kilroy with more than 630 units of 4250i INvent™ Series Simulated Double-Hung Projected windows for the Woolworth Tower Residences. "As their name indicates, simulated double-hung projected windows look like double-hung windows, but actually project from the plane of the wall, either inward or outward," says Apogee Renovation director Kevin Robbins. "Offset glass planes and narrow meeting rail profiles replicated the appearance of existing windows."

Kilroy Executive Vice President Bill Kennedy adds, "The building owner has stated, 'Your windows at the Woolworth look BEAUTIFUL.' It's a huge difference!"

The windows on the Woolworth Tower Residences' top 30 floors featured, double-hung units manufactured using non-thermal framing and 1-inch insulating glass without the low-e coatings available today. Floor-by-floor, the multi-phased window retrofit project was successfully completed with Wausau Window and Wall Systems' 4250i INvent Series Simulated Double-Hung Projected high-performance windows.

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**Bill Kennedy,
Kilroy Executive Vice President**

Careful renovation

Drawing from its 71-year history of commercial and landmark window replacement, Kilroy worked closely with Wausau—as supported by Apogee Renovation leaders—for a smooth and accurate installation. In Spring 2016, Kilroy began the multi-phased, scheduled retrofit project on the Woolworth Tower Residences.

Floor-by-floor, the team carefully removed the existing double-hung units. These had been manufactured using non-thermal framing and 1-inch insulating glass without the low-e coatings available today. After removing the previous unit, the rough opening was prepared using pre-assembled, extruded aluminum "panning" trim to help ensure the new Wausau window were easily installed plumb and square.

"The product performance and quality has been excellent, as we always expect from Wausau. The support from the Wausau team has been outstanding and critical in order to ensure a successful project," praises Kennedy.





**Reliable performance:
Energy-efficient, quiet,
comfortable, low maintenance**

To ensure smooth installation and performance as specified, the Woolworth Tower Residences' projected windows and terrace doors were fabricated under controlled conditions in Wausau's LEED-certified manufacturing center.

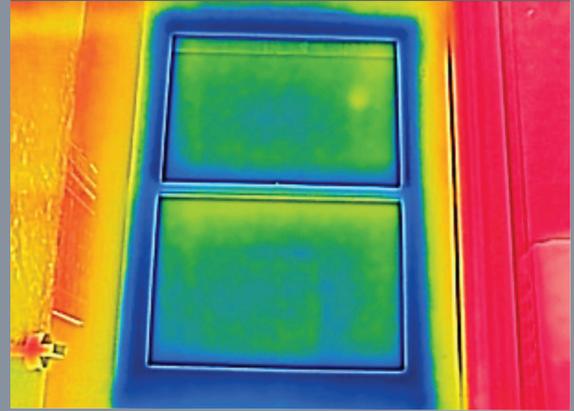
Along with using low-e, insulating glass, Wausau relied on its finishing partner, Linetec, to provide polyamide thermal barriers within the aluminum frame of the windows and doors. Wausau INvent Series windows can achieve thermal performance NFRC U-Factors as low as 0.34, a Condensation Resistance Factor as high as 65 and acoustic performance Sound Transmission Class ratings of 31 to 42.

"The combination of these high-performance components – aided by the 4.5-inch-deep systems, as well as Wausau's experienced engineering and quality fabrication – allow for minimal solar heat gain and better air infiltration performance, which supports energy efficiency and comfort," explains Robbins. (See thermal images at right.)

He continues, "In addition to helping maintain the desired interior temperature, the windows and doors also reduce unwanted noise when closed. When the residents prefer to open their windows for natural ventilation, projected windows are easier to open than hung windows and eliminate balances, which require continual maintenance, especially in large sizes with heavy glass."

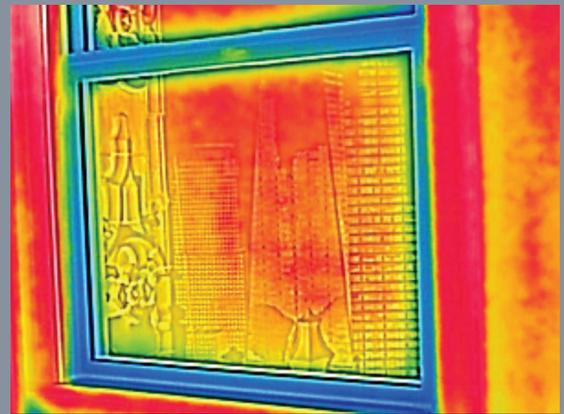


In these thermal images — cooler temperatures are shown in blue, while warmer temperatures are shown in red. On average, the surface temperatures of the new windows are 9 degrees Fahrenheit warmer in the winter than the old windows.



OLD

1. Interior thermal imaging of the old windows shows cold glass and framing surface temperatures. This indicates that the old glass (without low-e coating) is letting the 39 degree Fahrenheit outside conditions to permeate into the interior of the building.



NEW

2. Interior thermal imaging of the new windows shows warmer glass and framing surface temperatures. This indicates that the new glass (with a low-e coating) is keeping out the 50 degree Fahrenheit outside conditions, while keeping in the warm 72 degree Fahrenheit inside conditions. The low-e coating on the new glass also is reflecting the heat back inside the space, making it more comfortable for occupants.

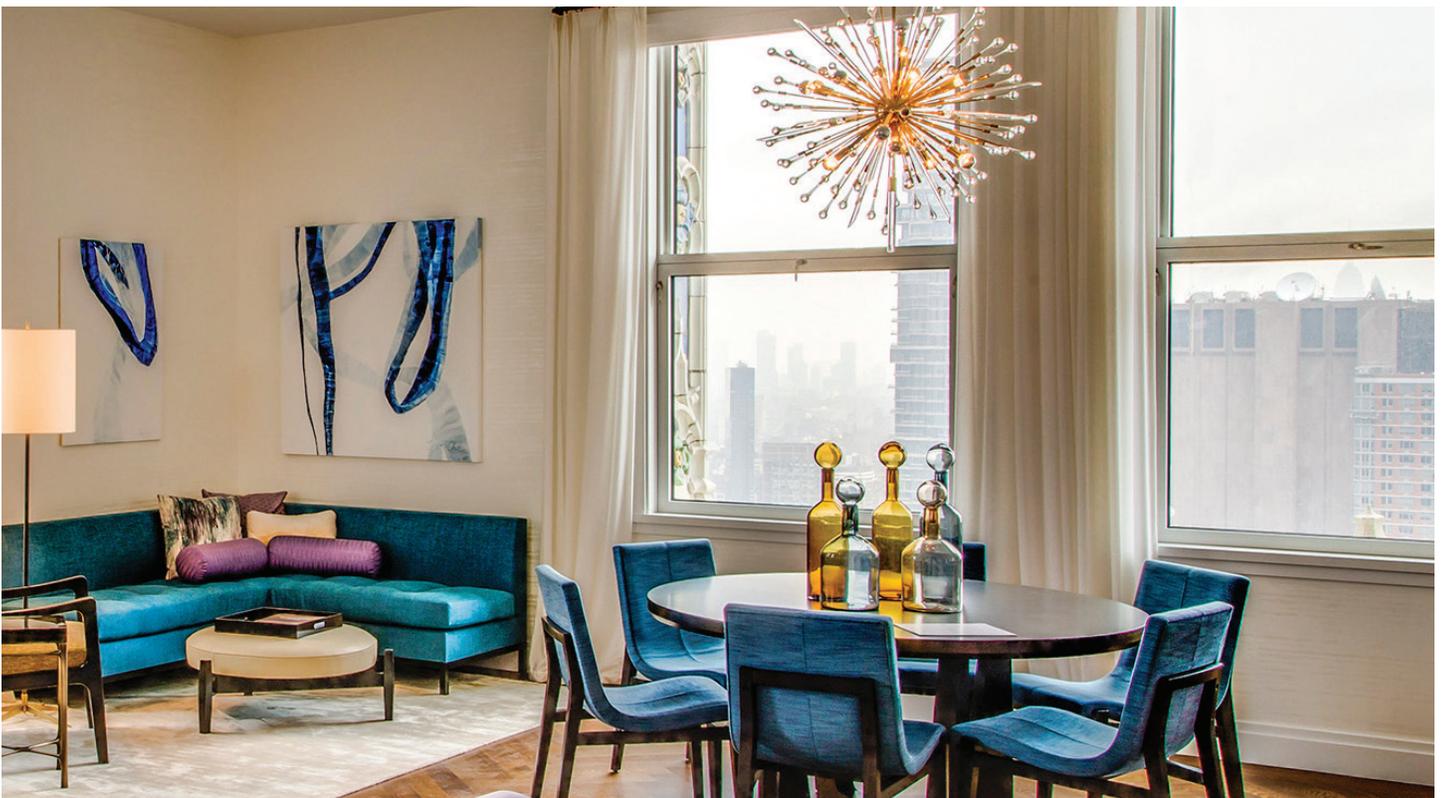
Enduring Appearance: Prestigious, historic, extraordinary

The Woolworth Tower Residences' new Wausau windows and terrace doors offer residents natural daylight and stunning views of the cityscape from nearly every room, as well as the extraordinary, exterior terra cotta ornamentation surrounding the windows.

Complementing the buildings' historic aesthetic, Linetec also finished the windows' exteriors in a color called "Dark as Night" using a two-coat 70 percent PVDF resin-based coating. These durable coatings help extend the window systems' lifespan and reduce future maintenance.

Robbins summarizes the renovation project's success saying, "Now completed, the windows on the Woolworth Tower Residences will provide improved thermal performance, which may be known only to the owner and occupants; while the windows' visible contribution to the building's historical look will remain evident to all."

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Kevin Robbins, Director, Apogee Renovation



The Woolworth Tower Residences, 2 Park Place, New York, NY 10007

<http://thewoolworthtower.com>

- ~ **Developer:** Alchemy Properties Inc.; New York; <http://www.alchemy-properties.com>
- ~ **Architect:** SLCE Architects, LLP; New York; <http://www.slcearch.com>
- ~ **Original architect:** Cass Gilbert; St. Paul, Minnesota; <http://www.cassgilbertsociety.org>
- ~ **Interior design:** The Office of Thierry W Despont, Ltd.; New York; <http://despont.com>
- ~ **General contractor:** CNY Group; New York; <http://www.cnygroup.com>
- ~ **Window contractor:** Kilroy Architectural Windows, Inc.; Bronx, New York; <http://kilroymetal.com>
- ~ **Window renovation strategists:** Apogee Renovation, an Apogee Enterprises, Inc., initiative; Minneapolis; <http://www.apog.com>
- ~ **Window systems – manufacturer:** Wausau Window and Wall Systems, an Apogee Enterprises Company; Wausau, Wisconsin; <http://www.wausauwindow.com>
- ~ **Window systems – finisher:** Linetec, an Apogee Enterprises Company; Wausau, Wisconsin; <http://www.linetec.com>
- ~ **Photo Credits:** page 1, photo by Tameo12/Shutterstock; pages 2, 3, 4, 5, 7, 8 (lower), 9 (lower), 12 (center and right), photos by Oleg March; pages 6, 8 (upper), 9 (upper), 12 (left) photos by Travis Mark; page 7, thermal images by Mike Sheppy; page 10, photo by Tameo12/Shutterstock; page 11, photo by Pierdelune/Shutterstock

WE CAN HELP.

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enhancing looks | improving value | saving energy

resources

architectural glass

Viracon | The leading North American fabricator of high-performance, custom-coated architectural glass for global markets

architectural framing systems

Alumicor | A Canadian-based supplier of architectural aluminum building envelope products

EFCO | A leading manufacturer of architectural aluminum window, curtainwall, storefront and entrance systems

Linetec | A leading architectural finishing company, offering high-performance paint and anodize finishes for aluminum

Sotawall | A full-service designer, manufacturer and installer of proprietary high-performance unitized curtainwall systems

Tubelite | A leader in eco-efficient aluminum storefront, curtainwall and entrance systems

Wausau Window and Wall Systems | A leading designer and manufacturer of energy-efficient, custom aluminum window and curtainwall systems

architectural services

Harmon | One of the largest U.S. full-service building glass and curtainwall installation companies

services

building survey

Determine conditions, perform thermographic inspection, recommend upgrades

energy modeling tool

Utility-grade, whole-building energy modeling

specification assistance

Review performance requirements

detail assistance

Architectural drawings of window and curtainwall products

budgeting

Provide installed options

network of installers

Recommend quality, authorized installers across North America

renderings

Visual representation of retrofit

INTERESTED IN LEARNING MORE?

Apogee Renovation provides high-performance glass, aluminum framing and window system solutions to optimize energy efficiency and enhance aesthetics of commercial properties.

With these solutions, building owners and developers can reduce energy costs, increase tenant satisfaction and improve overall value of their buildings.

To learn more, please contact Kevin Robbins, Director of Apogee Renovation, at krobbins@apog.com or 715-409-0821 or visit www.apogeerenovation.com.



ABOUT APOGEE ENTERPRISES, INC.

Founded in 1949 | Financially strong with over \$1.4 billion in sales | Traded on Nasdaq under symbol APOG | www.apog.com