



One World Trade Center is the tallest LEED certified building in the western hemisphere.

## Daikin's Customized Solutions Raised New Standards of Design

### ISSUE:

At 1,776 feet tall, One World Trade Center—the tallest building in the Western Hemisphere—rises above the Manhattan skyline. Opened in November 2014 and developed by The Port Authority of New York and New Jersey (PANYNJ), the skyscraper has raised new standards of design, construction, and prestige. Managed, operated, and leased by the Durst Organization, One World Trade Center is thought to be the most recognized and desirable office building in the world.

The design of all mechanical and life-safety systems at One World Trade Center had to meet PANYNJ's strict building-code and LEED Gold certification requirements. As a result, HVAC equipment was highly customized to meet efficiency, indoor air quality (IAQ), and sound-performance requirements, among other factors, as systems are located on office floors. Cooling and heating units were specified to feature high water pressure shell and tube condensers, a variable frequency fan drive, a BAS control system, customized energy efficient scroll compressors, and waterside economizers.

### SOLUTION:

Developers and PANYNJ became familiar with Daikin's equipment and project work at Javits Center through Prem Air of Long Island City, NY, Daikin manufacturing's representative. Based on the ability to meet IAQ, low-noise, and other technical and operational specifications established by design engineer Jaros, Baum & Bolles Consulting Engineers, Daikin was selected from one other manufacturer that could to meet specification. Daikin provided 166 packaged self-contained cooling and heating systems to accommodate more than 50 floors of the 104-story building.

Design of the HVAC was highly collaborative among many construction and mechanical firms involved on the project, with Daikin providing project management. "This is a project of a lifetime and was a first for Daikin in that we had never made equipment to match the customer's unique need with this level of customization before," says Robert Lisse, PMP, Northeast regional project manager with Daikin.



**NAME:**  
One World Trade Center  
**LOCATION:**  
New York, NY, USA



**FACILITY SIZE:**  
3,000,000 ft<sup>2</sup>



**ISSUE:**  
Supply HVAC solutions that meet stringent New York/New Jersey Port Authority and LEED Gold certification requirements



**SOLUTION:**  
(166) Daikin customized cooling and heating Self-Contained systems

## SOLUTION (CONTINUED):

The prototype self-contained system was subject to sound tests to meet 450 PSI. After the prototype met initial approval by developers, a mock-up of an office floor was created. "We invited all the mechanical firms, such as for piping and ductwork, into the mock-up and as a result of the collaboration, several changes were made to the HVAC equipment design," Lisse says. The effort included 3-D design to simulate maintenance access. The result was the moving of plumbing and fire-rated walls to allow for optimal maintenance and service of the HVAC self-contained system.



By combining high-efficiency scroll compressors, direct-expansion cooling, water-cooled condensers, water economizers and VAV control, Daikin self-contained units provide significantly higher operating efficiencies than alternative systems.

## OUTCOME:

Visitors and office workers are ensured of comfort given the reliability and quiet operation of the Daikin systems that serve more than one half of the floors at One World Trade Center. Customer Durst Organization is realizing the benefits of reduced operational costs of the self-contained units that greatly exceed

ASHRAE Standard 90.1 guidelines and don't require specialized staff to maintain.

The U.S. Green Building Council (USGBC) awarded the building LEED Gold certification. "This is a historic project for Daikin and we are very proud to have contributed," Lisse concludes.



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