

UPMC East Hospital

Overview

The University of Pittsburgh Medical Center (UPMC) hospital system includes more than 20 hospitals in the Pittsburgh area and employs more than 55,000 people. Located in the eastern suburb of Monroeville, UPMC East is the newest addition to this family of hospitals. The 300,000 square foot facility was constructed to ease the strain on the core group of hospitals within the city of Pittsburgh.

In addition to designing a state-of-the-art facility, a major goal was to build an energy efficient green building. The most common system used to rate a green or high-performance building is the Leadership in Energy and Environmental Design (LEED) certification. Created by the U.S. Green Building Council (USGBC), LEED is a nationally-accepted, performance-based benchmark for the design, construction, and operation of high-performance buildings. With its Silver Level certification, UPMC East is Pittsburgh's first hospital designed entirely to LEED standards.

UPMC brought in BBH Design, a Raleigh, NC-based sustainable architectural design firm with expertise in higher education and health care facilities. BBH Design selected CJL Engineering to design the electrical (power and lighting), mechanical, plumbing, and fire protection systems for UPMC East. CJL Engineering turned to Deckman Company, a Twin City Fan representative in Cuddy, PA, to help specify fans and other types of mechanical equipment because of their reputation and expertise in the HVAC industry.

Challenges

LEED for Healthcare references the most current and relevant standards for calculating ventilation rates, and includes a Minimum Indoor Air Quality prerequisite. Providing exhaust systems for areas where chemicals are used, and ensuring an adequate supply of clean outside air were high priorities. Exhaust fans had to be located a specific distance from the intake fans to prevent outside air contamination—which demanded high quality fans to meet the facility's stringent requirements.

Operating, emergency, isolation, and waiting rooms have different ventilation requirements—some areas must be maintained at a negative pressure while others must be at a positive pressure. The ventilation requirements of areas such as kitchens, stairwells, and even the garage required careful consideration.

Noise is another concern for hospitals and other health care facilities. Ventilation system noise must be minimized to meet



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Quick Facts

Industry

Health Care

Application

HVAC Systems

Customer

UPMC East - Monroeville, PA

Twin City Representative

Deckman Company - Cuddy, PA

Engineering Firm

CJL Engineering - Johnstown, PA

Architect

BBH Design - Raleigh, NC

Installing Contractor

Ruthrauff/Sauer - McKees Rocks, PA

Challenge

LEED design requirements, indoor air quality, proper fan location, and noise.

Solution

A variety of Twin City Fans were used in major exhaust systems for the operating rooms, restrooms, janitorial areas, laboratory hoods, kitchens, stairwells, and garage.

Result

UPMC East Hospital received high quality reliable fans that helped the facility achieve LEED Silver certification, and meet air quality and noise requirements.



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room noise criteria inside the facility. Additionally, exhaust fans either located outside of the building or ducted to the outside must meet community noise levels. The supply fans used in the generator room also required silencers to prevent transmitting generator noise to the outside.

Solution

To meet the air quality, noise, performance, and LEED design requirements of the UPMC East hospital project, TCF provided a wide variety of fans for numerous applications including Airfoil Centrifugal Fans for stairwell pressurization and Backward Inclined Utility Sets for kitchen exhaust. A variety of Centrifugal Downblast Roof Exhausters, Vaneaxial fans, Pressure Blowers, and Inline Booster Fans were also used for a variety of applications within the facility.

To ensure good indoor air quality, the exhaust fans were located a specific distance from the outside air intakes—preventing contaminated exhaust air from being pulled back into the facility. Extra precautions were also taken with the exhaust from the isolation rooms to keep contaminated air contained and utilized HEPA filtration systems to meet this requirement.

In addition to careful equipment selection and placement, using backward inclined fan blades, vibration isolation, and sound attenuation where required helped to achieve the noise level requirements.

Results

Not only did UPMC East hospital achieve LEED certification, it did so at the Silver Level. The facility also met the air quality and noise requirements. In addition to using premium fans from TCF and HEPA filtration systems, the air quality requirements were met by exhausting the proper amounts of air based on careful calculations and coordination with the air balancing contractor.

Noise from exhaust fans on a lower roof adjacent to patient rooms was one concern. However, by using an acoustical curtain wall, noise levels within patient rooms were at, or below, the recommended 35 dBA range. In general, the overall noise levels were below the required 50-60 dBA limitations, depending on the time of day.

Fans from TCF met the specific requirements for this project. Also, support from TCF engineers helped to meet the requirements and challenges of the project. The fans continue to function as intended without issues, which is a testament to the reliability and quality found in Twin City Fan products.