



## FORD CENTER

### Overview

Twin City Fan was selected to provide the fans for a massive renovation of the Ford Center building, located in the historic Warehouse District of downtown Minneapolis. The eleven-story building, constructed in 1914, was initially used as the first (and last) vertical assembly plant and showroom for Henry Ford's Model T vintage automobiles. Today, the building currently serves as general office space. Over the last century, the building has undergone a series of renovations – this time the renovations focused on energy and space savings. The design and renovation was overseen in Washington, D.C. by the National Park District, since the Ford Center is on the National Historic Register. The building's architect and engineer, Hammel, Green and Abrahamson (HGA), is the major tenant and designed the building to meet strict LEED Gold requirements.

### Challenge

The Ford Center required a serious overhaul in order to meet the future needs of the building, and the new revamped design posed several challenges for construction. With 270,000 square feet of space, HGA wanted to maximize the amount of space that could be used by tenants, thus limiting the space allocated for the fan equipment. The fans had to fit within a small area to optimize the usable space while providing low-sound operation to create a quiet, welcoming environment for tenants. Tight timeframes for delivery and meeting the building's high energy efficiency goals were challenges that needed to be overcome to successfully complete the project.

### Solution

Air handler number one was located on the main floor and fed into an overhead air distribution system, while the air handling units in floors two through ten were designed for an under-floor air distribution system. To accommodate this particular application, ten MPQN modular plenum return fans, along with ten EPQN plenum supply fans were used. This combination provided the ideal solution for this challenging installation, successfully meeting the space requirements, offering low sound operation and providing the required energy savings. One of the best features that the MPQN and EPQN fans offer is their small size – making them a great choice for applications with little space to spare. The MPQN and EPQN are typically used in field-fabricated and factory-built air handling units to pressurize the entire surrounding air plenum, which allows the discharge ductwork to be directly connected to an air handler from any direction. Both of these fan models also carry the AMCA seal for sound and air.

Haakon Industries' custom air handling equipment was used to house the ten EPQN fans, which were internally isolated on heavy-

## Quick Facts

### Application

Class A Office Building Indoor Air Handling Units

### Customer/Project

Ford Center – Historical Warehouse District in Downtown Minneapolis

### Twin City Fan Representatives

Thomas Bredesen & Mark McCollough, Midwest Mechanical Solutions

### Mechanical Engineer

Craig Lemma, Hammel, Green & Abrahamson

### CAD Designer

Gwen Dewars, Hammel, Green & Abrahamson

### Mechanical Contractor

Paul Worwa, Allan Mechanical

### Challenge

Small space, energy efficiency and low sound requirements

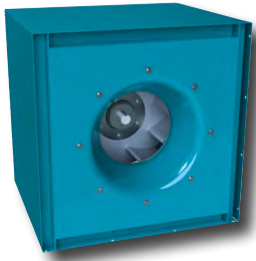
### Solution

Careful planning, detailed design and superior installation combined with Twin City Fan's custom manufacturing abilities and dedication to quality

### Result

On-time installation that met budget and space constraints. The system exhibits superior acoustics and efficiency with minimal preventative maintenance required

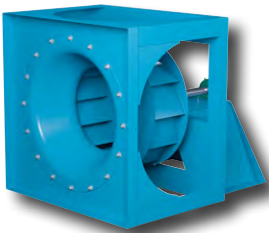
# CASE STUDY



## Model MPQN Modular Plenum Fan

**Wheel Sizes**  
12.4" to 49"

**Performance**  
Airflow to 76,000 CFM  
Static pressure to 12" w.g.



## Model EPQN Plenum Fan

**Wheel Sizes**  
12.4" to 3"

**Performance**  
Airflow to 185,200 CFM  
Static pressure to 12" w.g.

Twin City Fan & Blower has the engineering and manufacturing capabilities to accommodate virtually every conceivable application. We have completed thousands of successful installations worldwide and have a proven track record for tackling the most technically complex and unique applications.

We separate ourselves from the competition by offering a greater breadth of products and quickly adapting to the needs of our customers. This is truly a testament to our company philosophy – respond to the needs of the customer, the first time, every time.



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5959 Trenton Lane N | Minneapolis, MN 55442  
Phone: 763-551-7600 | Fax: 763-551-7601

duty structural C-channel steel framing and 2" spring isolators to minimize the vibration to the building. The air handlers also included a perforated fan housing to further reduce sound in the low to mid frequencies. The EPQN 402, Class III, Arrangement 4 fans met the required airflow of 35,000 CFM at 1,150 RPM, with an operational BHP of 33.8 at a static pressure of 4.0 inches w.g. NEMA premium efficiency 40 HP motors with Yaskawa variable frequency drives were used to allow for flexibility in varying the airflow – resulting in greater energy savings. Shaft grounding rings were also factory mounted to prevent premature bearing failure.

Design and development began in December of 2010 and required the HVAC equipment to be onsite by April of 2011. With the help of the experienced management of Tom Bredesen and Mark McCollough at Midwest Mechanical Solutions, Twin City Fan & Blower was able to successfully meet this delivery schedule.

### Benefits

Choosing TCF fans for this project offered a number of benefits. According to Tom Bredesen, "The MPQN is a very quiet, compact fan and was a good fit for this application because we were worried about acoustics in the space." The fans were internally isolated so their vibrations would not get sent to the structure. The 16-gauge acoustical cabinet included perforated metal with high density insulation in order to attenuate and absorb the noise of the return fan. The MPQN fans operate at sound pressure levels of 76 dBA at the inlet and 70 dBA at the outlet. In addition, the MPQN fans are incredibly energy efficient. They meet ASHRAE Standard 90.1 for energy efficiency and the 15 HP NEMA Premium Efficiency Motors meet the Xcel Energy Motor Rebate standards.

Additionally, Xcel Energy provided considerable rebate dollars for energy efficient fan motors and variable frequency drives. Both the supply and return fans were provided with Piezometer rings (a fan speedometer of sorts) and transducers. A 2-10 VDC signal reports to the Building Management System to determine how much airflow the fans are producing. It is a great tool to help optimize system energy savings. The fans were dynamically and statically balanced in the factory to BV-3 standards, 0.15 inches peak-to-peak vibration levels, which helped to provide for a flawless startup.

### Summary

The Ford Center building renovation was a challenging, high-profile project with tight deadlines, stringent energy efficiency requirements, challenging sound demands and considerable space constraints. However, thanks to Twin City Fan products and the expertise of Midwest Mechanical Solutions, the overall project was a major success.