



Quick Facts

Industry

Automotive

Application

Spray Paint Booth Exhaust

Customer

Automotive Facility

Twin City Fan Representative

Kent Air Products, Inc.

Location

Spartanburg, South Carolina

Challenge

Providing the proper ventilation equipment for the first “green,” water-based spray paint booths in the world.

Solution

Twin City Fan & Blower’s BCS model and Swing Out Fans

Result

First Direct Drive pedestal plug type air supply fans used in the paint booth’s ventilation system, greatly reducing VOC and HAP compound emissions.

AUTOMOTIVE

Overview

A new automotive plant with one of the first water-based spray paint facilities of its kind in the United States, installed customized Twin City Fan (TCF) air-supply ventilation fans to assist in facilitating their “green” initiatives. The fans specified for this project helped reduce VOC and HAP compounds and fulfill EPA and ISO 14001 requirements for the customer’s spray booth ventilation system.

In the end, TCF and the spray booth manufacturer exceeded delivery requirements to meet the time schedule and had the fastest start up in automotive history.

Challenge

Twin City Fan had to meet the specifications for a custom spray booth ventilation system located in a 4-million-square-foot automotive manufacturing plant. The facility consisted of an automated body and paint shop that was seven stories high and contained 4.5 miles of conveyors. The shop paints approximately 1,000 vehicles a day using water-based paints in varying exterior colors.

Compliance with local clean air legislation and maintenance of environmentally friendly production processes were required to eliminate emissions of solvent vapors and odor. Clean production processes, including the ventilation and green recycling practices, were necessary.

Solution

The specialized application was a first for Twin City Fan. They stepped up to the challenge to meet the European standards for direct drive fans for oven heater boxes used in the paint curing process. “Thirty-one BCS model heater box supply fans were supplied,” says Tom Kent Sr., owner of Kent Air Products, Inc., Plymouth, Michigan, the TCF representative that provided the fans for the automotive spray booths. The BCS fans, along with swing-out spray booth exhaust fans, were ideal for meeting the customer’s requirements for fast cleaning and quick inspection. “Swing-out fans with heavy duty door bearings which provide door support are the best choice for applications requiring frequent cleaning and inspections of the fan wheel and interior of the housing, as found in spray painting booth exhausts.”

The Twin City BCS fans used for this project were high efficiency backward curved industrial fans designed for handling relatively clean air in high pressure applications. They feature a wide

CASE STUDY



Model BCS
Backward Curved High
Volume/Pressure Fan

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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wheel and housing, producing a high volume of air at a lower velocity. And as an added benefit, they eliminate the need for an expansion evase (a diffuser at the fan outlet that gradually increases to decrease velocity and to convert kinetic energy to static pressure at the fan outlet and inlet).

“The air supply fans had to meet American as well as European design standards for direct drive fans to supply oven heaters rated for 600°F. The fans had to be designed to accommodate 31,000 CFM and had to meet air stream temperature ranges up to 800°F. Combined, the fans had to account for more than 2 million CFM of air to meet the needs of the large automotive plant,” Kent says.

Airflow in paint booths must be even and compatible with the desired conditions and appropriate codes. Moreover, paint booths need to be engineered to thoroughly move air at the proper rates while maintaining a clean painting environment. Energy-efficient fans designed for water-based painting systems are better suited for the environment, however require more time for drying than solvent based paint. Today most paints are solvent based, but that is rapidly changing due to pending legislations. These solvents escape into the air, contribute to air pollution, and can damage the environment.

Green

In addition to European design standards, the facility’s spray booths were able to conform to environmental guidelines, automotive industry standards, specifications, energy economy and recycling procedures in order to become the first “green” water-based spray paint booth in the world. The paint shop was able to administer numerous methods of recycling, including: utilizing paint sludge from various colors as waste energy for other production facilities, replacing high solvent paints where possible in order to reduce air emissions, and as the paint shop is the largest overall consumer of energy in the facility, using LFG (landfill gas) in the role of thermal energy in order to reduce the shop’s reliance on natural gas.

Benefits/Results

Meeting European design and specification standards will continue to play a key role in ensuring Twin City Fan remains at the forefront of adapting fan technology for a variety of upcoming paint systems in the U.S. market and in paint shops worldwide. As a leading manufacturer of fans for the automotive market, Twin City Fan continues to work with major manufacturers to provide sound economic and environmentally friendly solutions to spray paint as well as a host of other applications.