



## LAB EXHAUST: OLD DOMINION UNIVERSITY

### Overview

Located in the coastal city of Norfolk, Old Dominion University is Virginia's entrepreneurial-minded doctoral research university with more than 24,000 students, rigorous academics, an energetic residential community and initiatives that contribute \$2.6 billion annually to Virginia's economy.

Old Dominion University began construction on its new chemistry building in February 2019, which is scheduled to be completed by November 1, 2020. Approximately 5,000 students take chemistry each year in preparation for most STEM-H majors. The new state-of-the-art building will include teaching and research facilities as well as undergraduate teaching laboratories and cutting-edge research laboratories.

The university's newest building will be a four-story 110,000 square-foot innovative learning center. The new chemistry building is being funded by a state bond issue, in part intended to increase the number of students in STEM-H, those majoring in science, technology, engineering, math and health. Inside, wet, dry and organic labs are spread out with students and esteemed faculty expertly manning each station.

Inside the university's new chemistry building, 94 fume hoods accommodate the exhaust requirements of the state-of-the-art laboratories, which are located on all four floors of the building. And where there are fume hoods and lab exhaust systems, there must also be high-quality, reliable exhaust fans. As a result of a successful bidding process, Old Dominion University turned to its Twin City Fan representative Hobbs & Associates Inc. to supply the fans.

### Challenges

For the new labs, the university required ventilation fans that could remove fumes from all labs. The fans had to be in operation simultaneously, provide sufficient plume height and supply sufficient CFM.

Because it's a U.S. Environmental Protection Agency requirement, plume height was a high priority. For each fan, the plume height had to be at least 52 feet to meet the facility's design requirements. To accomplish this, the minimum airflow and pressure requirements for the largest fans would have to be between 26,000 and 32,000 CFM at 4.5 inches w.g. of static pressure.

## Quick Facts

### Industry

Institutional & Hospitality

### Application

Lab Exhaust

### Twin City Fan Representative

Hobbs & Associates - Norfolk, VA

### Engineering Firm

JRC Mechanical, LLC - Chesapeake, VA

### Challenge

Ventilation fans had to meet plume height requirements, while also meeting airflow, sound and vibration requirements

### Solution

TCF's Model BAIFE induced flow lab exhaust fans and Model TFE fume exhaust fans

### Result

Once the building is complete, results will be forthcoming. If specifications and proven performance mean anything though, this will be another win for Twin City Fan



Twin City Fan 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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The fans also had to meet noise and vibration requirements. The sound level from each fan could not exceed 88 dBA and vibration had to be minimized.

## Solution

Twin City Fan supplied nine direct drive Model BAIFE induced flow lab exhaust fans and four Model TFE high-velocity fume exhaust fans. The BAIFE centrifugal, backward inclined, airfoil fans are designed specifically for laboratory fume hood exhaust applications. Each 40-inch fan can supply up to 27,500 CFM at 4.5 inches w.g. of static pressure. The speed of each fan is controlled by a variable frequency drive. Although each of the 18-inch TFE fans are capable of supplying 4,780 CFM, the maximum building flow for these four fans is 980 CFM at 3.0 inches w.g.. However, the additional bypass flow is 3,800 CFM.

The BAIFE fans accommodate 90 of the lab hoods. There are three sets of lab fans with each set having three fans – one fan accommodates 10 lab hoods. The four TFE fans service four labs individually.

There are no mixing boxes or plenums. Ambient entrainment air is pulled through the outlet nozzle of the fans. The nozzle increases the speed of the exhaust stream into the windband. The accelerated air entrains surrounding ambient air into the windband diluting the exhaust.

## Results

Since the Old Dominion University chemistry building is scheduled to be completed by November 1, 2020, results will be forthcoming. However, if specifications and proven performance mean anything, this will be another win for Twin City Fan and its sales representative, Hobbs & Associates Inc.

The lab exhaust system design was based on fans from a Twin City Fan competitor. The TCF representative discussed the schedule, specifications and the value Twin City Fan can bring to the project. Based on the competitor's design criteria, Twin City Fan specified alternative fans that exceeded the specifications of the competing fans. TCF and Hobbs & Associates were awarded the project.

The new chemistry building at Old Dominion University can operate safely knowing that its lab exhaust system from Twin City Fan will meet – or exceed – all specifications.