

## Aircuity case study

# Albion College

## Significantly Improved Energy Efficiency and Indoor Air Quality in Science Buildings

**ALBION COLLEGE LOCATED IN SOUTH CENTRAL MICHIGAN IS A** liberal arts institution committed to academic excellence in preparing students to anticipate, solve and prevent problems in order to improve the human and global condition. Dedicated to preserving the values of the past, to serving the needs of the present, and to anticipating the goals of the future, Albion strives to make environmentally responsible decisions in support of the college's energy efficiency initiatives.



In 2005, Albion College completed a \$41.6 million renovation and expansion of its science buildings to bring it to one complex on a 3.5 acre site. Putnam Hall, supporting physical and analytical chemistry, was completely renovated, and four-story Kresge Hall was constructed, providing teaching and research labs for biology, biochemistry, and organic chemistry. Albion College pursued and earned a LEED® Silver rating but was still challenged with designing energy efficient systems for its laboratories, due to the typically high demand of energy for these types of resources.

### LAB DCV AIDS IN HIGH PERFORMANCE

Albion College engaged with Aircuity and their local representative Quality Air Service, Inc. to develop a ventilation optimization program that would significantly improve overall energy efficiency and optimize building ventilation in Kresge and Putnam Halls which collectively house 61 labs and preparation areas. Utilizing

Aircuity's OptiNet system to monitor and control air change rates in 30,000 square feet in Kresge Hall and 11,200 square feet in Putnam Hall, Albion was able to reduce energy use in support of its campus-wide initiative of energy efficiency within its facilities.

The industry standard approach for laboratory ventilation is to provide a fixed or constant number of air changes which consequently uses 100% outdoor air. However, this approach can also lead to wasted energy by providing too much ventilation when indoor conditions are clean. The Aircuity system's Lab Demand Control Ventilation (Lab DCV) technology continually senses and analyzes laboratory environments and provides ventilation inputs to adjust the air changes per hour (ACH) in those facilities as needed, moving away from a model of constant or fixed ventilation rates.

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**Bill McCoy**

Director of Maintenance and Energy Management  
Albion College

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### RESULTS - PAYBACK IN LESS THAN 2 YEARS

In August 2010, Albion implemented Aircuity's OptiNet system, providing the ability to analyze the buildings indoor environment and provide intelligent inputs to the building management systems, making adjustments to the ventilation flow as needed and allowing the facility to optimize airflow as efficiently as possible.

Aircuity's OptiNet system has exceeded Albion College expectations. With a less than 2 year pay back and \$32,000 utility rebate, the implementation of the OptiNet system and DCV technology has also reduced the unoccupied minimum airflow by 50% and has helped Albion College save \$125,000 per year in total annual costs by reducing electrical, heating and cooling energy use.

The continuous monitoring provided critical information that has helped improve lab procedure such as lowering of air changes. The initial air change rates varied between 3 to as high as 16 ACH. With the OptiNet system the rate was able to be lowered to 2 air changes unoccupied and can remain at 2 when air quality is favorable. The turn down on outside air has proven to be much better than projected according to Bill McCoy, Director of Maintenance and Energy Management at Albion College. They achieved an outside air turn down from an actual occupied baseline in Kresge Hall of 52,000-56,000 CFM to a new baseline of 25,000-26,000 CFM and in Putnam Hall a 10,250 CFM to 4,000 CFM.



The reductions in pre-conditioning the air and subsequent ventilation and exhaust horsepower were significant. The reduction of re-heat was an unforeseen benefit. Due to an extreme diversity factor designed in the original ventilation rates the labs were prone to dramatic sub-cooling even during unoccupied times resulting in re-heat that was profound.



Aircuity is often the most significant energy conservation method implemented at college campuses. The annual savings and energy incentives allow for millions of dollars that are being saved to be allocated to other educational projects. Aircuity has taken the idea of a high performance building and turned it into a reality, creating a strategic energy conservation plan while reducing energy costs significantly and contributing to substantial utility rebates.

#### ABOUT AIRCUITY

Aircuity is the smart airside efficiency company providing building owners with sustained energy savings through its intelligent measurement solutions. By combining real-time sensing and continuous analysis of indoor environments, Aircuity has helped commercial, institutional and lab building owners lower operating costs, improve safety and become more energy efficient. Founded in 2000 and headquartered in Newton, MA, Aircuity's solutions have benefited organizations such as the University of Pennsylvania, Eli Lilly, Masdar City, the Bank of America Tower and the University of California-Irvine. For additional information on the company and its solutions, please visit: <http://www.aircuity.com>.

