SOLUTION AT A GLANCE: ORNL TECH DEMO: ACHIEVING ENERGY AND COST SAVINGS WITH ADVANCED AIR BARRIER SYSTEM TECHNOLOGIES

BARRIER
Identifying or evaluating energy-saving technologies

TOOL TYPE
Case Study

TECHNOLOGY
Envelope/Enclosure, Insulation, Air Sealing, Thermal Bridging and Air Barriers

OVERVIEW
Air leakage is responsible for 6 percent of the total energy used by commercial buildings in the U.S. Consequently, infiltration and exfiltration are among the largest envelope-related contributors to heating, ventilation, and air conditioning loads in these buildings. New air-sealing technologies aim to improve the performance of air barrier systems by simplifying the installation procedure.

LIQUIDARMOR™ CM Flashing and Sealant is an example of one of these new advanced material technologies. A spray-applied sealant and liquid flashing, it can span gaps up to ¼ of an inch wide without any supporting material. Recently Oak Ridge National Laboratory (ORNL), in partnership with the Department of Energy, verified the performance of LIQUIDARMOR™ CM with field tests and energy simulations from a building in which LIQUIDARMOR™ CM was a component of the air barrier system. The demonstration site was the Homeland Security Training Center at the College of DuPage in Glen Ellyn, Illinois. Blower door test results show the average air leakage rate in the demonstration site to be 0.15 cfm/ft² at 1.57 psf, or 63 percent lower than the 0.4 cfm at 1.57 psf specified in the 2015 International Energy Conservation Code (IECC). According to the results of the simulation, the Training Center lowered its annual heating and cooling costs by $3,000, or 9 percent, compared to a similar building without an air barrier system. This demonstration serves as an example of the level of building envelope airtightness that can be achieved by using (and properly installing) air barrier materials, as well as illustrating the possible energy and cost savings.