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Cooperating In Containment

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Cooperating in containment

Two Kansas State University research institutes are collaborating with industry to advance the science of biological hazard containment.

The Institute for Environmental Research and the Biosecurity Research Institute are combining their expertise and leading facilities with Merrick and Co. to support the transition of the National Bio- and Agro-Defense Facility to Manhattan, Kan. Merrick is a global leader in biocontainment design and function, said Scott Rusk, director of Pat Roberts Hall, which houses the Biosecurity Research Institute at Kansas State University.

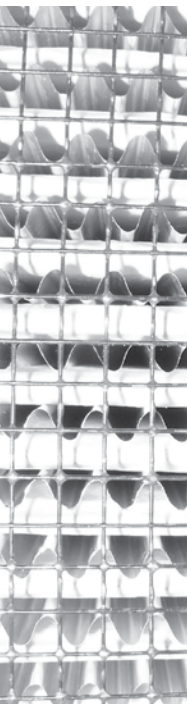
The collaboration's goal is the creation and operation of the first High-Efficiency Particulate Air — or HEPA — filter Biological Containment Assessment and Education Center. The project will span three years and will support and enhance national biosecurity defense priorities, develop critically required capabilities and advance both the applied and fundamental basis for the safe design and operation of advanced filtration systems for biological containment, said Steven Eckels, professor of mechanical and nuclear engineering and director of the Institute for Environmental Research.

The center's first project is examining a novel commercial biosafety technology called AutoScan. It uses computer analysis to test and verify the performance of HEPA filters automatically. Currently, the industry standard for filter performance is manual verification. AutoScan is poised to save man-hours through its automation and provide superior test accuracy and cost savings.

HEPA filters are used in hospitals and surgical wards, as well as various technical industries, including infectious disease research, nuclear facilities, vaccine manufacturing and microelectronics manufacturing.

“A primary feature of higher levels of biocontainment is the ability to filter air that passes through the laboratories and animal spaces and to capture any potential infectious material in those filters, cleansing the air before it is released into the atmosphere,” Rusk said.

The Biosecurity Research Institute is a biosafety level-3 agriculture facility for research on infectious plant and animal diseases. The building uses 175 HEPA filters for its 31,000 square feet of lab, animal holding and support space. The filters are manually tested and certified each year. To protect maintenance personnel before performing tests on each filter, the filters and their housings must be decontaminated — a time-consuming process.



Two university centers partner with industry to research performance and safety of new air filter verification technology

“A safe and accurate automated verification system that could be used without decontaminating the filter housing could greatly enhance operations,” Rusk said.

Eckels is leading a team working with Rusk and others to evaluate performance and operation of the AutoScan. The Institute for Environmental Research team has expertise in designing and conducting unique test and evaluation protocols for novel problems involving airflow, filtration and particulate distribution.

Their findings could help AutoScan become the verification standard for the biocontainment industry.

The Department of Homeland Security also has an interest in how the AutoScan technology performs and supports research and training opportunities. The agency has provided a letter of support for the project.

Two test rigs are being designed for the Biosecurity Research Institute. Once installed, researchers will conduct a series of comprehensive tests to evaluate AutoScan. Eckels’ team has designed a custom test apparatus and will use an extensive number of industry-standard HEPA performance measures in evaluation.

Kansas State University will be the first third party to integrate performance evaluation with procedural and educational development for AutoScan.

“The overall idea behind this effort is that the more basic and applied science we can bring to this technological innovation, the better we can understand how to use this technology and operate it safely,” Eckels said.

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By Greg Tammen, Communications and Marketing