

Menace in a bottle: Detecting liquid explosives

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The DHS Science & Technology Directorate's SENSIT research will detect liquids and gels such as these. Credit: DHS

After the plot to blow up trans-Atlantic airlines with liquid explosives was uncovered in London in August 2006, there has been pressure on the airline industry, and Homeland Security, to find new ways to not only detect liquids in baggage and on airline passengers, but also to figure out what they are. Now, the DHS Science & Technology Directorate (S&T) is teaming with scientists at the Los Alamos National Laboratory to find a possible solution.

“Having to place your consumable liquids through the baggy routine when going through airport security may one day be history,” says S&T

Program Manager on the project, Mr. Brian Tait, “and that’s going to make a lot of people very happy. This is a new screening prototype that definitely shows promise.”

In late June, Los Alamos National Laboratory team successfully completed proof of concept of an extremely sensitive future screening technology. The new technology scans the magnetic changes of individual materials at the molecular level and stores them in a database, which then allows the differentiation and identification of many materials that may be packaged together or separately as they go through the screening process.

It uses the same technology that brain scans are performed with, and is based on ultra-low field magnetic resonance imaging (MRI) which is already being used in medical field for advanced brain imaging. The end goal is to eventually put it next to the current x-ray screener.

The SENSIT technology has already demonstrated the ability to differentiate more than four dozen materials considered “safe” for carrying onto aircraft –from everyday personal items like toothpaste to mouth wash – to those that are considered hazardous .

“With the MRI signal, we want to distinguish between harmful items, and many common carry-on liquid consumables,” says Tait. “The goal is reliable detection of liquids, with high throughput, that is non-contact, non-invasive, requires no radiation, produces no residue and uses the existing airport security portal.”

SENSIT is one of S&T’s Homeland Innovation Prototypes (HIPS) projects – high-impact innovative technologies that have shown great promise and are on their way to being transitioned to industry for manufacturing and distribution.

"We're working hard on getting the SENSIT technology to an airport near you very soon," says S&T's Innovation Director, Roger McGinnis.

Source: US Department of Homeland Security

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