DHS Science and Technology Directorate
Homemade Explosives Characterization

Homemade Explosives Characterization Mission

The HME Characterization Program is a crosscutting portfolio focused on (1) explosive detection characterization, (2) threat assessments and prioritization, and (3) tests, tools and methodologies relating to explosives research. The HME Characterization Program ensures the explosives community has a clear understanding of homemade and emerging explosive threats to improve detection technology, develop detection requirements, inhibit the unlawful use and manufacture of HMEs and provide a solid foundation for solutions to counter the threat, such as pre-planning tools for responders and event planners. The HME Characterization Program, as outlined by the three interrelated operational goals above, identifies and meets Department of Homeland Security needs through program activities.

S&T assists TSA and other stakeholders by providing them with the ability to deploy detection capabilities with enhanced HME detection, acquire HME data for their specific missions, and provide tools for threat mitigation and safer data collection. This is facilitated by conducting data collection efforts to investigate and characterize detection signatures, physical blast performance and develop blast performance based risk assessments and information platforms. These efforts support development programs and identify mitigation strategies to protect against current and evolving threats.

To establish confidence in screening devices before the TSA makes acquisition commitments, the HME Characterization Program via the Tyndall Reactive Materials Group works closely with the Transportation Security Laboratory (TSL) to ensure data collection is capable of meeting TSA's rigorous performance requirements. To accomplish this, the HME Characterization Program provides the TSL with data on HMEs using detection equipment ranging from early prototype testing, to preliminary readiness testing, to final qualification testing. Once technologies have passed TSL's qualification testing, they will be transitioned to TSA's Transportation Systems Integration Facility (TSIF) for determination of operational suitability.

S&T delivers data to update the 2016 TSA Detection Standards

The HME Characterization program has had success providing information to update the 2016 TSA Detection Standards which results in equipment deployed with enhanced detection algorithms. The program provides full threat weight data to the TSA Office of Security Capabilities on explosives of interest for vendor algorithm development and to improve accuracy on Transportation Security Equipment (TSE) such as X-ray technologies and Advanced Imaging Technology (AIT).

Blast characterization work being performed at Tyndall Air Force Base

S&T Customers/Partners

TSA is the primary customer for the HME Characterization Program. Other S&T customers include the DHS National Protection and Programs Directorate-Infrastructure Security Compliance Division and the United States Secret Service. Mission partners include the FBI, DoD, ATF and the Israeli Security Agency. In addition, S&T continually coordinates with Department of Energy National Laboratories, the Transportation Security Laboratory (TSL) and Tyndall Reactive Materials Group in support of the program.

HME Laboratory Capabilities