

Trace Contraband Detection and Chemistry Laboratory: Certifying Trace Contraband Detection Systems

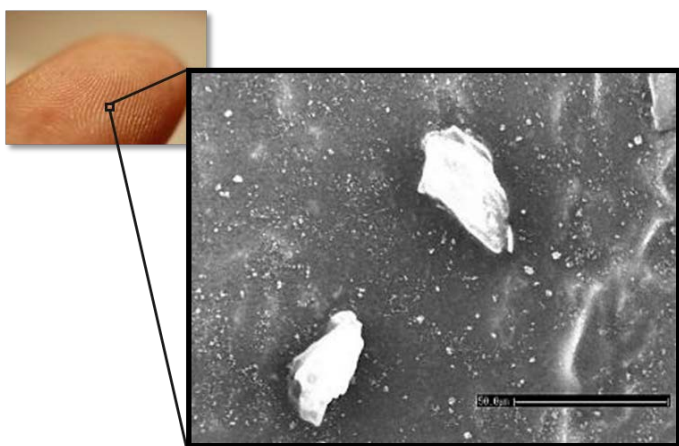


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WHAT DOES TRACE MEAN?

Contraband materials (e.g., explosives, narcotics, etc.) can generally be detected via one of two methods: bulk-based or trace-based techniques. Trace detection is used to identify particles of material that are typically invisible to the naked eye (e.g., picograms to micrograms) as shown below. Trace particles are generated after contact with bulk material or an improvised explosive device, contaminated tools and/or surfaces, etc. and are commonly found in explosive latent fingerprints.



A scanning electron microscope image of trace quantities of RDX found in an explosive latent fingerprint.

TRACE CONTRABAND DETECTION AND CERTIFICATION

These trace contraband particles can be identified by using a variety analytical tools such as mass and ion mobility spectrometry (MS and IMS, respectively). These trace contraband detection methods identify the material of interest based on their mass or size (i.e., cross section) with very high specificity.

The mission of the ISO-certified and 17025-accredited Trace Contraband Detection and Chemistry Laboratory (TCDCL) is to perform test and evaluation (T&E) of these

developed detection technologies; certifying that they will be able to identify contraband material with high specificity. With the specialized expertise of its staff and a wide variety of explosives, the Transportation Security Laboratory (TSL) is the first stop for T&E of trace contraband detection systems. TCDCL is recognized worldwide for their expertise in developing, validating, and supporting the T&E of trace contraband detection systems.

These systems include those developed for screening people, luggage, packages, and vehicles. With its state-of-the-art research facilities, TSL has evaluated almost all of trace explosive detection technologies in use throughout the world today. Working with industry, academia, and other domestic and international security organizations, TCDCL continues to enhance current technology and the security of the traveling public at home and abroad.

DEVELOPMENT AND PRODUCTION

The laboratory and its specialized staff continually strive to establish and enhance sampling and testing methods, develop novel testing substrates to mimic “real-world” materials such as hands, and provide quality control, standards, and assurance tools (i.e., analytical analysis methods, standard operating procedures, etc.) for use in T&E. These tools are subsequently used to produce quality-controlled substrates and standards for use in the T&E of a contraband detection system, ensuring it has been evaluated in a fair and unbiased fashion and meets the required detection requirements.

CURRENT PROJECTS

- Standard development, preparation, and verification of contact (i.e., swab-based) and non-contact (e.g., optical or vapor-based) methods
- Analytical method development
- T&E methods for Trace Contraband Detectors



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- Transfer efficiency determinations
- Characterization of new contraband materials
- Standoff Laser Technologies Test Preparation
- Development of a Research Grade IMS-MS, with capability to perform ion chemistry studies and ion mobility spectrometric characterizations of homemade explosives and new threats encountered in the field
- T&E Certification of Trace Contraband Detectors

COLLABORATORS AND PARTNERS

- Domestic State and Government Agencies (e.g., NYPD, NIST, TSA, etc.)
- International Government Agencies (e.g., CBSA, TC, DSTL, IPO, etc.)
- Academia (e.g., Stockton and Purdue Universities)
- Industry (e.g., Smiths, L3, DSA, etc.)

