

The Hound™

Handheld Explosives Detection System

Description

The Hound™, developed by Sandia National Laboratories, is a hand-portable sample collection and preconcentration device that, when combined with chemical detectors, enables the detection of trace amounts of explosives, drugs, and other chemicals. Advances in Sandia's patented chemical preconcentrator technology have enabled the development of this small sample collection and preconcentrator tool that is portable, inexpensive, sensitive, and fast. This portable device uses a miniaturized version of the technology first used in the explosives detection personnel portal developed by Sandia for the Federal Aviation Administration, now the Transportation Security Administration.



The operator collects a swipe sample that will be preconcentrated and delivered to a GE Ion Track VaporTracer™, a commercial chemical detector, for analysis.



The front-end “sniffer” can be detached to allow easier vapor sample collection.

Features of the Hound System

- When combined with a commercial detector, detects trace amounts of a variety of explosives.
- Operates in two modes: **vapor** (inhale fumes or particles) or **swipe** (collect particles from surfaces)
- Collects vapor from enclosed locations such as a car trunk, a briefcase, or a locker
- Vapor mode does not require contact
- Portable
- High sensitivity—in combination with a commercial detector, can detect low-nanogram quantities of high explosives
- The commercial IMS detector can be configured to detect illegal drugs
- Can be adapted to many detectors
- Can supplement canine or physical searches



The Hound™ sample collector and pre-concentration unit works with a commercial detector to detect traces of explosives and drugs.

Operation

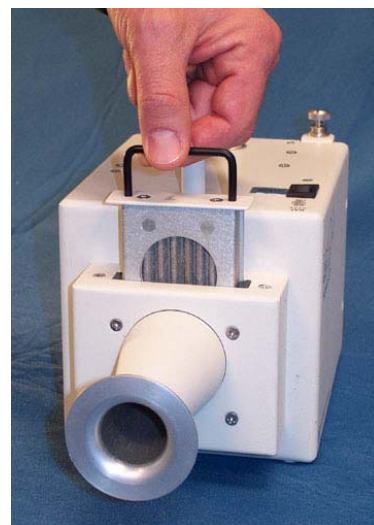
The Hound™ provides swipe or vapor collection capabilities in a single portable unit. The combined unit of a Hound and a commercial ion mobility spectrometer (IMS) can easily detect sub-fingerprint quantities of chemical residue. For swipe collection, a sampling screen is wiped across the suspect surface and inserted in the device. For vapor collection, a blower draws in a large volume of air and collects explosives and other chemicals from the air stream onto a metalized screen. Next, the Hound vaporizes these compounds into a smaller parcel of air that is then delivered to a detector. The Hound sample collection and pre-concentration unit can be detached from the detector to allow easier sample collection. The Hound enhances the real-world detection capabilities of the IMS by delivering the sample to the commercial detector in a concentrated form.

Availability

Sandia is exploring licensing opportunities for the Hound™. Hand-portable devices are currently fabricated on a contractual basis to meet the requirements of individual customers. This development work was sponsored by the Department of Energy, the Federal Aviation Administration, and the Federal Bureau of Investigation.

Applications

Detection of explosives and illegal drugs at military bases, sensitive facilities, embassies, airports, or border crossings.



Inserting a vapor cartridge.



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