

Smiths Detection - HazMatID 360



GENERAL DESCRIPTION:

Extensive on-board spectral library to rapidly ID solid and liquid chemicals based on distinct molecular fingerprints. Capable of identifying over 32,000 substances including nerve & blister agents, TICs, white powders, explosives & explosive precursors, drugs & drug precursors, common chemicals, and pesticides. Features automated mixture analysis which allows effective chemical assessment of samples that may have been contaminated with more than one material, like water or dirt. Mixture analysis, combined with chemical hazard classification capabilities enables advanced data handling and comprehensive analysis using ruggedized FTIR technology in the field. Built-in Bluetooth wireless communication to allow for immediate data transmission out of the hot zone to a command center and/or ReachBackID™ support services to aid with information integration prior to decon. Also includes PEAC® decision support software, which provides users with detailed information regarding management of hazardous chemicals.



TECHNICAL DESCRIPTION:

Incorporates FTIR spectroscopy to ID a broad range of materials. In this technique, infrared (IR) optical radiation from 4000 to 650 wavenumbers (cm⁻¹) passes through a chemical medium where it is absorbed by the oscillating electric fields of bonding electrons and lattice vibrations. As such, FTIR is applicable to virtually all covalent organic and inorganic compounds. It is particularly sensitive to polar functional groups associated with unsaturated and aromatic hydrocarbons (petroleum products), nitrates (explosives, fertilizers), organophosphates (pesticides, WMDs), hydroxyls and carbonyls (drugs, solvents), etc. Purely ionic compounds (e.g., sodium chloride) do not possess the requisite electronic structure to be identified by any FTIR system. The diamond attenuated total reflection (ATR) sample interface allows users to analyze materials with virtually no sample prep. The ATR measurement involves attenuation of the evanescent field of a totally internally-reflected IR beam emanating from the diamond sensor into a sample. Technique permits easy, reproducible measurements with minimal training. To identify a solid or liquid chemical, the user places a small portion (at least 1 mg) on to diamond sensor and cleans sensor with an alcohol swab when finished.

Tier Selection

Final tier assignment is based on overall product score.

- Top Tier
- Second Tier
- Third Tier
- ◐ Fourth Tier
- Bottom Tier

RANKINGS

	Biological	Chemical	Radiological
FIELD USE System	N/A	●	N/A
MOBILE Laboratory	N/A	●	N/A
DIAGNOSTIC Laboratory	N/A	●	N/A
ANALYTICAL Laboratory	N/A	◐	N/A

Survey Source

Vendor Supplied Information

CONTACT INFORMATION

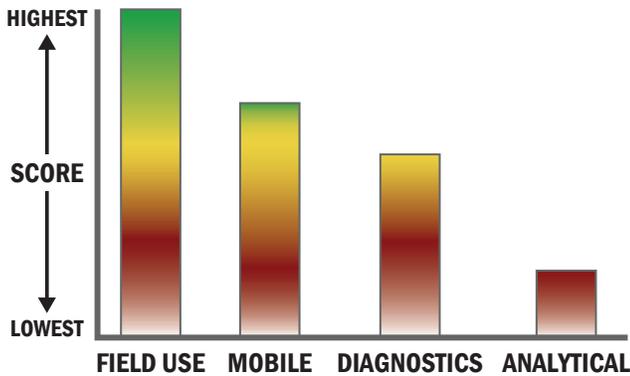
Smiths Detection
 21 Commerce Drive
 Danbury, CT 06810
 203-207-9700
 www.smithsdetection.com

COST

- >\$50,000/system
- \$0/analysis

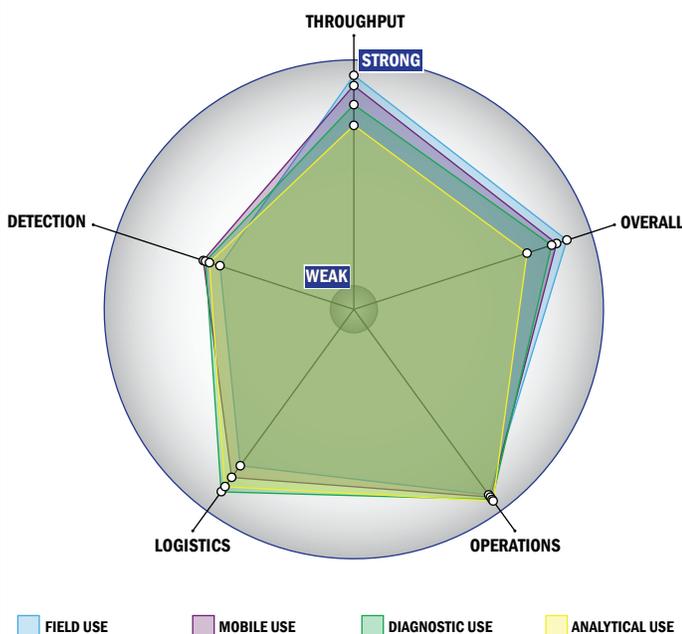
Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



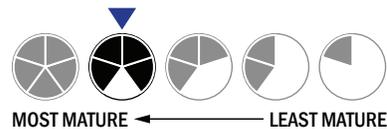
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- 1 sample, >10 tests/sample per run
- 349-96 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 0 components
- No set-up of the system is required
- Automatic detection

Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a toaster
- Between 5 and 25 kg
- Wireless and wired connections are available
- System or device uses batteries
- 2-4 hours battery life



Operations:

- Can be used from 4 °C to 41 °C
- Performance is not influenced by relative humidity
- Greater than 3 years shelf life
- Greater than 10 years expected life
- Results can be viewed in real-time
- The system could easily be adapted into a fully autonomous system
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

Detection:

- Possible the system could receive 510K clearance, no current efforts at this time
- Possible the system could receive FDA approval, no current efforts at this time
- Less than 10 µL
- Superior specificity. System has a false alarm rate approaching zero (~0%)
- 100 ppm-1 ppt
- Possible system could identify aerosolized chemical agent
- System currently can identify liquid chemical agent

