

Hamilton Sundstrand Corporation - ThreatShield-C



GENERAL DESCRIPTION:

The ThreatShield-C™ is an automated chemical vapor detector designed to detect toxic industrial chemicals (TICs) and chemical warfare agents (CWAs) in fixed-site applications. Multiple ThreatShield-C™ detectors provide an integrated chemical warning system. The simple mounting characteristics, continuous operation, low maintenance requirements, and broad detection capabilities make the ThreatShield-C™ ideal for the protection of buildings, public venues and critical transportation hubs from chemical attack. High sensitivity and a low false alarm rate provide reliable Detect-to-Warn capability.



TECHNICAL DESCRIPTION:

The ThreatShield-C™ detects toxic vapors by sampling ambient air through a proprietary inlet system. This inlet system selectively transfers TICs and CWAs into an analyte gas flow that sweeps target vapors through an ionization region and into the Differential Mobility Spectrometer-Ion Mobility Spectrometer (DMS-IMS2) sensor. The DMS acts as a pre-filter for subsequent IMS analysis, greatly reducing chemical background noise and the associated false alarm responses. Two IMS drift tubes allow the simultaneous detection of both positive and negative ions, broadening the types of compounds detected and decreasing the time for alarm response.

CONTACT INFORMATION

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POC: Dr. Andrew Szumlas

COST

N/A

Tier Selection

Final tier assignment is based on overall product score.

● Top Tier ● Second Tier ● Third Tier
● Fourth Tier ● Bottom Tier

RANKINGS

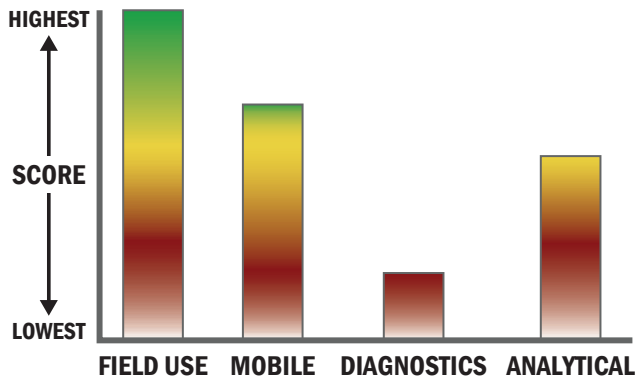
	Biological	Chemical	Radiological
FIELD USE System	N/A		N/A
MOBILE Laboratory	N/A		N/A
DIAGNOSTIC Laboratory	N/A		N/A
ANALYTICAL Laboratory	N/A		N/A

Survey Source

Vendor Supplied Information

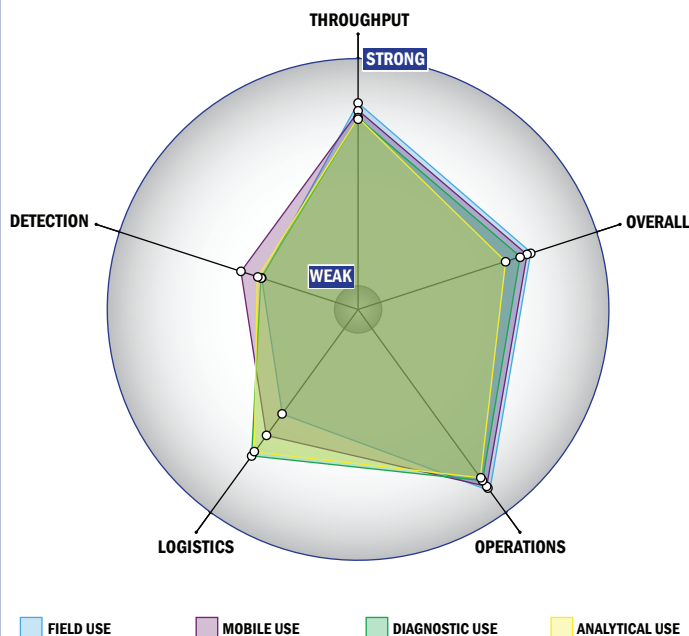
Scoring Analysis

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.



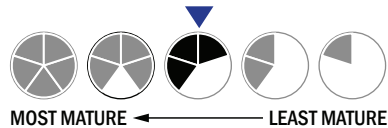
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- Multiple samples, multiple 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
- Greater than 20 minutes is required for set-up
- Automatic detection

Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a carry-on luggage suitcase
- Between 5 and 25 kg
- Wired connections are available
- System or device has 110V electrical requirement



Operations:

- Can be used from -21°C to 42°C (All temperatures)
- 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 be adapted to a fully autonomous system with some effort
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

Detection:

- This system does not test liquids
- $> 1 \times 10^{-3} \text{ mg/m}^3$
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent