Chemring Detection Systems, Inc. - Juno

GENERAL DESCRIPTION:

JUNO® is a hand-held chemical detector that is capable of detecting, identifying, quantifying and alerting the user to the presence of chemical vapors. JUNO® detects at levels significantly below immediately dangerous to life and health (IDLH) for chemical warfare agents (CWAs) and at the ASTM Acute Exposure Guideline Level 2 (AEGL-2) 30-minute concentrations for toxic industrial chemicals (TICs).

The JUNO® system utilizes a differential mobility spectrometry (DMS) sensor engine with a tunable ion mobility filter. The benefits of this technology are increased selectivity and sensitivity and simultaneous detection of nerve and blister agents.

JUNO® is a small sensor package with a low false alarm rate and high probability of detection that enables users to monitor chemical agent exposure levels and confirm decontamination effectiveness. Interaction with the system is simple. JUNO® has a menu-driven interface that notifies users with audible and visual alarms when a threat is detected. The unit has increased sensitivity, one or two orders of magnitude superior to current handheld detectors.

JUNO® has been extensively tested at GDATP facilities and at various government and independent laboratories, including ECBC, against a wide range of chemicals including CWAs, TICs, and explosives. JUNO® has been validated to detect GA, GB, GD, GF, VX, AC, CK, HD, NH3, and Lewisite. The TICs that have been validated include: chlorine, hydrogen cyanide, cyanogen chloride, hydrochloric acid, hydrogen sulfide, nitric acid, hydrogen fluoride, sulfur dioxide and ammonia. JUNO® is not affected by common interferents such as paint, Windex®, engine exhaust, and DEET.

TECHNICAL DESCRIPTION:

JUNO® is based on differential ion mobility spectrometry (DMS) which uses the nonlinear dependence of ion mobility under high field conditions to separate ions with similar mobility seen in low-fields of IMS. Ions within a DMS flow through an analyzer region where they are subjected to two electrical fields, a high frequency, high potential asymmetric waveform, and a low potential DC field. These two fields create a tunable filter that allows ions to be sorted. This yields improved selectivity and sensitivity over IMS and allows the simultaneous detection of both positive and negative ions.

CONTACT INFORMATION

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COST

- N/A/system
- $0/analysis

Tier Selection

Final tier assignment is based on overall product score.

Top Tier Second Tier Third Tier
Fourth Tier Bottom Tier

RANKINGS

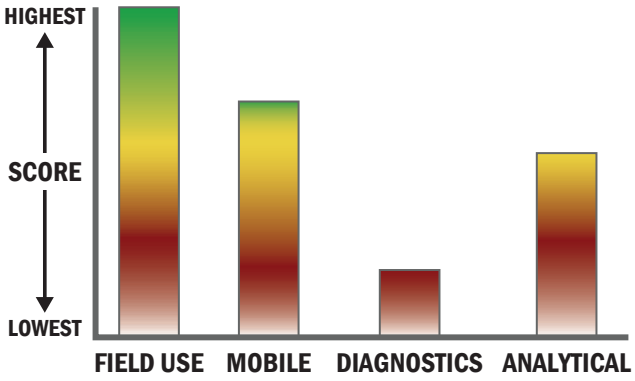
	Biological	Chemical	Radiological
FIELD USE System	N/A	Top Tier	N/A
MOBILE Laboratory	N/A	Top Tier	N/A
DIAGNOSTIC Laboratory	N/A	Top Tier	N/A
ANALYTICAL Laboratory	N/A	Second Tier	N/A

Survey Source

Vendor Supplied Information

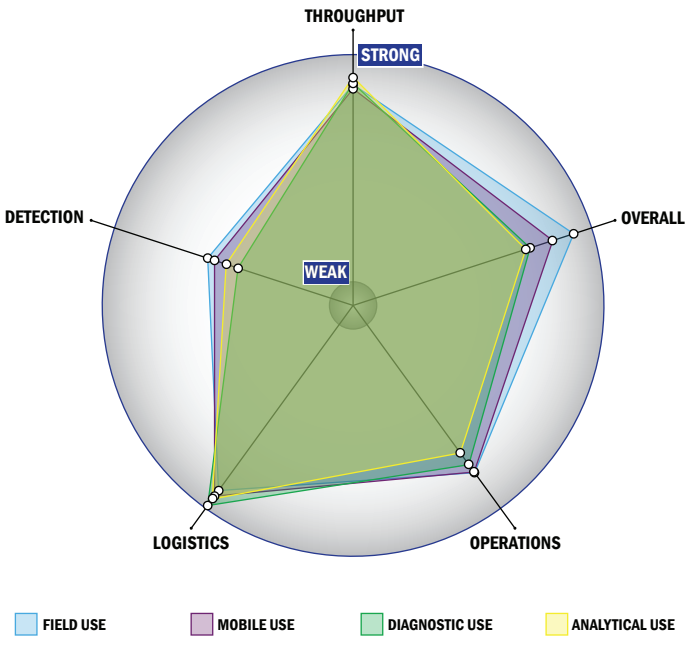
Scoring Analysis

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.



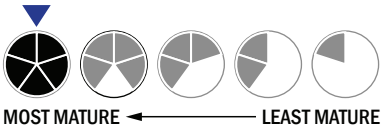
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- Continuous operation with no defined runs
- System is continuous and provides real time analysis with no defined tests/samples
- The system or device is currently semi-automated
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 0 components
- 5-10 minutes is required for set-up
- Automatic detection

Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a soda can
- Less than 1 kg
- Wired connections are available
- System or device uses batteries
- 4-8 hours battery life



Operations:

- Can be used from < -21°C to > 42°C (All temperatures)
- Performance is not influenced by relative humidity
- Greater than 10 years expected life
- Results cannot 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
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- $1x10^{-4}$-$1x10^{-3}$ mg/m^3
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent