

# Smiths Detection - GUARDION GC/MS



## GENERAL DESCRIPTION:

GUARDION utilizes high speed, high resolution gas chromatography (GC) and a revolutionary miniaturized toroidal ion trap mass spectrometer (MS) to identify volatile and semi-volatile organic compounds (VOC's and SVOC's). GUARDION is hand-portable and ruggedized. Its high speed GC combined with a miniaturized toroidal ion trap mass spectrometer redefines the size, weight, and speed for hand-portable GC/MS technology.



GUARDION is ready to operate within five minutes from a cold start. The CUSTODION™, a solid phase microextraction (SPME) fiber syringe, is used for simple sample collection and injection into the GC/MS system.

GUARDION features both a touch screen and keypad for operation. All software required for sample identification and reporting is on board. Additionally, the system can operate from a single battery charge for up to 3 hours. GUARDION is backed by first-rate service, training and 24/7/365 ReachBackID™ technical support to ensure optimum product performance.

## TECHNICAL DESCRIPTION:

GC/MS is considered the “gold standard” for chemical identification. GUARDION's low-thermal mass GC column uses a heating element intertwined with a 5-meter, 100 micrometer i.d. capillary that provide very rapid heating rates as well as excellent compound separation properties.

GUARDION's unique miniaturized toroidal ion trap mass spectrometer includes an additional center electrode that produces a toroidal ion trapping field. This allows the ions to be spread out over a greater volume and reduces the space charge effects that are common to traditional ion trap designs.

GUARDION's software includes special data processing and search algorithms that compensate for the differences between mass spectra produced by ion trap and quadrupole mass spectrometers.

Sample collection and introduction are performed using a SPME (solid phase microextraction) syringe. The SPME fiber incorporated in the syringe has a polymer coating that absorbs organic molecules. The molecules are then released into the GC when the syringe is inserted into GUARDION's heated injector port.

## 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 |
|------------------------------|------------|----------|--------------|
| <b>FIELD USE System</b>      | N/A        | ○        | N/A          |
| <b>MOBILE Laboratory</b>     | N/A        | ◐        | N/A          |
| <b>DIAGNOSTIC Laboratory</b> | N/A        | ◐        | N/A          |
| <b>ANALYTICAL Laboratory</b> | N/A        | ◐        | N/A          |

## Survey Source

Vendor Supplied Information

## CONTACT INFORMATION

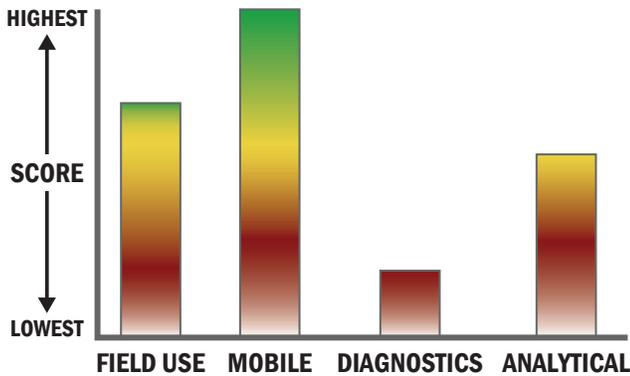
Smiths Detection  
 21 Commerce Dr  
 Danbury, CT 06810  
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## COST

- \$153,800/system
- \$9/analysis

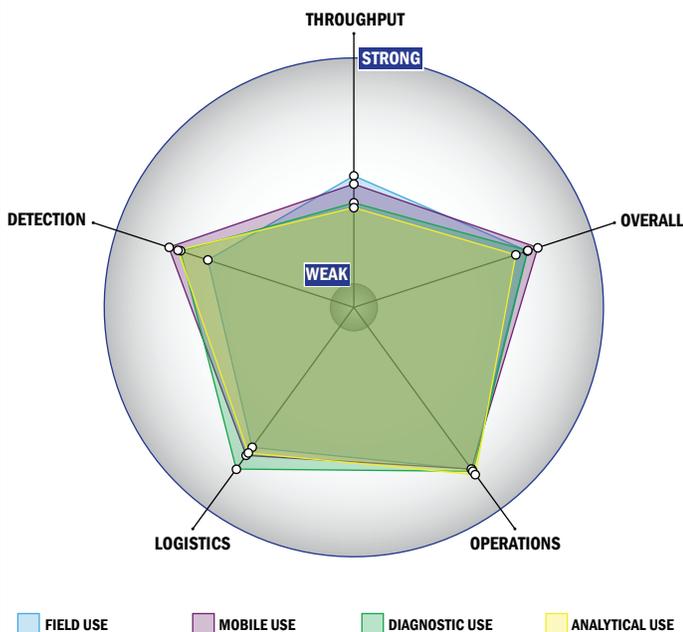
## Scoring Analysis

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.



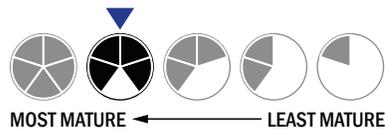
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- 1 sample, single test/sample per run
- Less than 32 samples every 2 hours
- 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
- 3 components
- 5-10 minutes is required for set-up
- 3-5 steps are required for detection

### Logistics:

- A day of training and technical skills are required
- Approximately the size of a carry-on luggage suitcase
- 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
- Components must be stored at room temperature (27 °C)
- Performance is not influenced by relative humidity
- Greater than 3 years shelf life
- 5-10 years expected life
- Results can be viewed in real-time
- The system is not capable of autonomy
- 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
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- >1x10<sup>-3</sup> mg/m<sup>3</sup>
- ppb-1 ppm
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent