

# Defiant Technologies, Inc. - CANARY-3



## GENERAL DESCRIPTION:

Defiant Technologies offers the CANARY-3™ Portable Gas Chromatograph (GC) analysis system. MEMS technology allows us to reduce the size of a lab GC to a semi-volatile organic compound (SVOC) analyzer that weighs less than 3 pounds and is battery operated.



The CANARY-3™ can provide lab quality results with ppb detection limits in a 5 minute analysis. The CANARY-3™ can be calibrated for a variety of SVOCs. The instrument display will inform the user which SVOCs are detected and their concentration. An on-board SD card stores all of the data the CANARY-3™ has acquired. The CANARY-3™ is intended to be used in the field to analyze air and liquid samples and provide lab quality results in about 5 minutes of analysis time.

## TECHNICAL DESCRIPTION:

The CANARY-3™ is a portable Gas Chromatograph analysis instrument. It is a “systems approach to chemical analysis” constructed using Micro-electromechanical Systems (MEMS) technology components. The key components are a pre-concentrator (PC), a micro gas chromatograph (GC) column (2.5 meters), and a pair of Surface Acoustic Wave (SAW) micro balance detectors.

The CANARY-3™ instrument captures a gas sample in the PC, a chemically-selective porous media, and then thermally desorbs the sample in a sharp, concentrated pulse. A sample enters the GC in a sharp pulse, and then separates into individual constituents as a result of interactions with a coating. The time between sample injection and emergence of the constituents from the column is used to identify the analyte. The measured weight of the sample is related to the concentration of the analyte in the gas sample. The Canary-3 offers “Smart Sampling” which incorporates dual detectors. This allows the instrument to provide a much greater dynamic range of analysis. The instrument includes a display that provides real time information on instrument activities, analyte identification and concentration.

## 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

## CONTACT INFORMATION

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## COST

- \$36,000/system
- \$0/analysis

## Notes

CANARY-3 is not to be confused with the CANARY Technology by Path sensors Bio-Flash System.

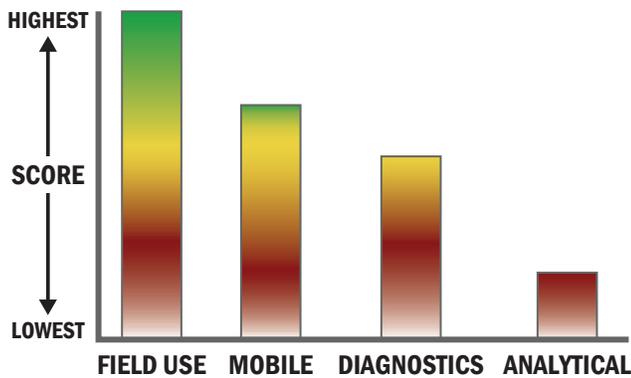
## Survey Source

Vendor Supplied Information



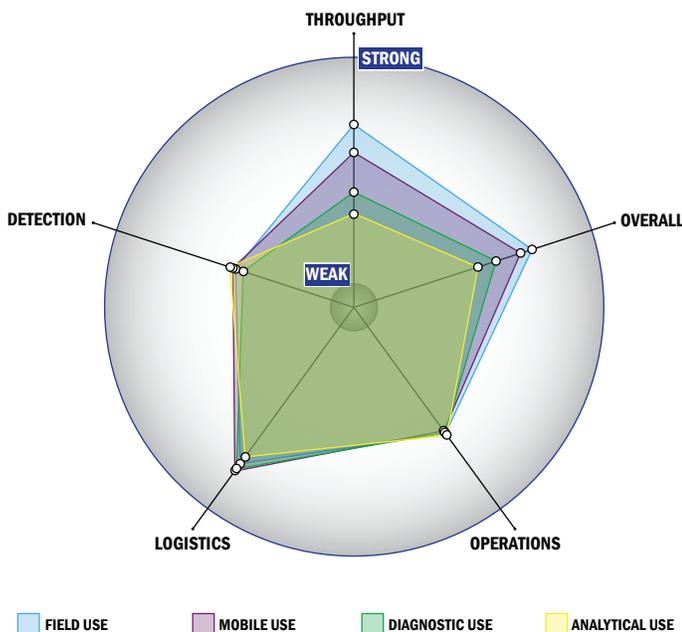
## Scoring Analysis

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.



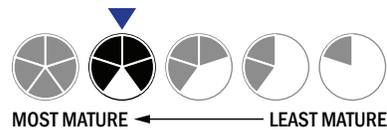
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- 1 sample, single test/sample per run
- Less than 32 samples every 2 hours
- The system could be adapted to a semi-automated system with some effort
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 1 component
- Less than 5 minutes is required for set-up
- 1-2 steps are required for detection

### Logistics:

- A day of training and technical skills are required
- Approximately the size of a toaster
- Between 1 and 5 kg
- Wired connections are available
- System or device uses batteries
- 4-8 hours battery life



### Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at 4 °C
- Performance is not influenced by relative humidity
- 3-5 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:

- 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%)
- > 1x10<sup>-3</sup> mg/m<sup>3</sup>
- 1 ppb – 1 ppm
- System can currently identify aerosolized chemical agent
- System can currently identify liquid chemical agent