

# ALMSCO International - BenchTOF-dx



## GENERAL DESCRIPTION:

BenchTOF-dx is a high performance GC based time-of-flight mass spectrometer for the detection of both target and unknown compounds in complex matrices. The MS detector has a "bench top" size, approximately equivalent to a conventional GC. It is compatible with every GC application and offers full spectral sensitivity (1-1500 Da) at similar levels to the selective ion monitoring (SIM) mode of quadrupoles. The instrument can be located in either a conventional laboratory or transported in a mobile laboratory environment, with no reduction in performance. BenchTOF-dx is GC platform neutral. GC control and data analysis uses existing vendor software or proprietary data analysis software (MOSAIG) is available. BenchTOF-dx is currently being used in a broad range of applications e.g. CWA, environmental, toxicology and food safety.



## TECHNICAL DESCRIPTION:

BenchTOF-dx MS detector is designed specifically for the analysis of CWA compounds. BenchTOF-dx is a reflectron based TOF instrument which incorporates innovative design features. The TOF detection technology is based on the flight time of charged ions derived from electron ionization of compounds within an ion source. This time interval accurately identifies the mass of all the ions generated for a compound and ultimately creates a spectrum. By careful design of the ion optics, flight tube and detector, spectra created by BenchTOF-dx have a classical profile which allows conventional identification of both target and unknown compounds at trace levels using well known MS libraries. The ionization technique is based on direct extraction in which both ionization and extraction down the flight tube occur within the same ion source volume. BenchTOF resolution is sub unit mass and sufficient to exclude matrix effects and chemical noise. System sensitivity with full spectrum data is equivalent to Selected Ion Monitoring (SIM) using quadrupole detection.

## 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	<span style="color: red; font-size: 2em;">●</span>	N/A
<b>MOBILE Laboratory</b>	N/A	<span style="border: 1px solid black; border-radius: 50%; padding: 5px;">○</span>	N/A
<b>DIAGNOSTIC Laboratory</b>	N/A	<span style="color: green; border: 1px solid black; border-radius: 50%; padding: 5px;">◐</span>	N/A
<b>ANALYTICAL Laboratory</b>	N/A	<span style="color: green; font-size: 2em;">●</span>	N/A

## CONTACT INFORMATION

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## Survey Source

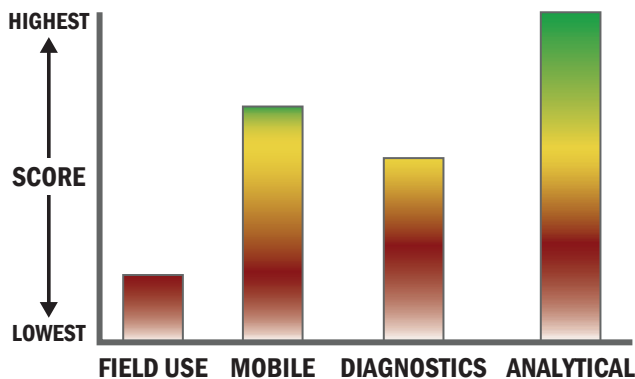
Vendor Supplied Information

## COST

- \$150,000/system
- N/A/analysis

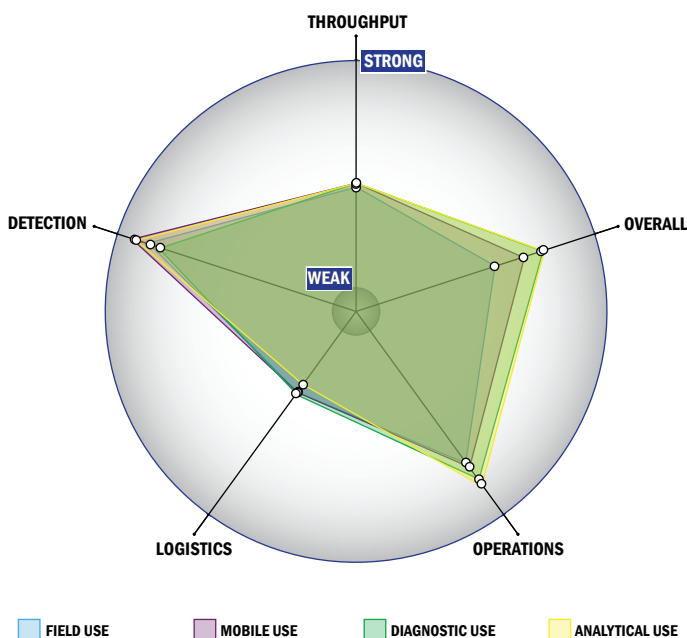
## Scoring Analysis

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.



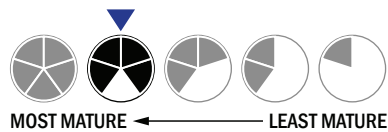
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- 1 sample, >10 tests/sample per run
- 95-32 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 1 component
- Less than 5 minutes is required for set-up
- 1-2 steps are required for detection

### Logistics:

- More than a day of training and significant technical skills are required
- Approximately the size of a carry-on luggage suitcase
- Wireless and wired connections are available
- System or device has 110V electrical requirement



### Operations:

- Can be used from 4 °C to 37 °C
- Device must be used in a temperature stable, dry environment for optimum performance
- Greater than 10 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

### Detection:

- Less than 50 µL
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- <math>1 \times 10^{-6}</math> mg/m<sup>3</sup>
- 1 ppb – 1 ppm
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent