Research International, Inc. - TacBio Aerosol Detector

GENERAL DESCRIPTION:

TacBio was developed by the U.S. government for military, homeland security, and public health applications. It is a compact and rugged portable biological particle detector that uses both diffractive scattering and natural biological fluorescence to monitor aerosol particulates and classify them as being of either biological or non-biological origin. Research International, Inc. is an official licensee of the U.S. government for the TacBio, and has the right to manufacture and sell the instrument worldwide.

The TacBio is extremely useful for tracking background levels of airborne non-biological and biological materials and providing an alarm and/or digital activation command to other equipment if there is a rapid increase in the aerosol background. It cannot identify the type of biological material detected, and for that reason it is correctly characterized as an aerosol 'trigger.'

The TacBio requires little maintenance and no consumables, and is an ideal first line of defense for monitoring areas that cannot be accessed regularly or must be monitored discretely. Since no consumables are used, operating time in the field is limited only by the availability of electric power. The device accepts a range of primary and rechargeable long-lived batteries that provide in excess of 24 hours continuous operation. Additionally, there is no difficulty operating at sub-zero temperatures since no liquid-based media are required. Operation may be monitored remotely using Windows-based software provided with the unit, and changes made to its operating characteristics as needed or desired.

TECHNICAL DESCRIPTION:

TacBio operation is based on the fact that aerosolized biological materials fluoresce, in addition to scattering light when irradiated by UV light, in this case from a long-lived LED. Fluorescence emission and photon scattering events are measured with a unique "Geiger counter" high-speed photon counting method and analyzed by software to create a snapshot every 60 seconds of biological and non-biological particulates present in sampled air. These aerosol statistics are stored in a 30 minute-long 'History' file. Every 60 seconds current particle statistics are compared with this moving baseline to determine if an unusual increase in particle concentration has occurred.

CONTACT INFORMATION

Research International, Inc.
17161 Beaton Road SE
Monroe, WA 98272
POC: Jonathon Tobelmann
703-625-8381

COST

- $30,000/system
- <$0.01/analysis

Tier Selection

Final tier assignment is based on overall product score.

Top Tier | Second Tier | Third Tier | Fourth Tier | Bottom Tier

RANKINGS

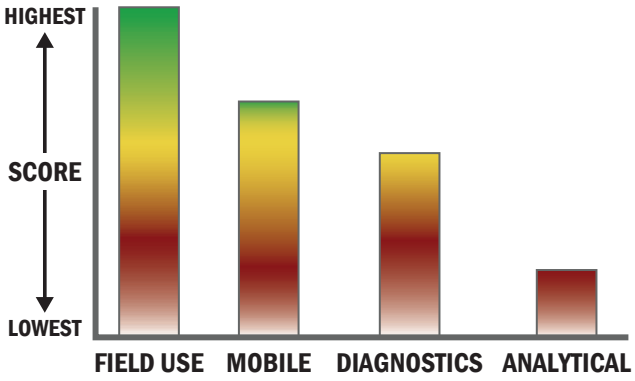
	Biological	Chemical	Radiological
FIELD USE System	Top Tier	N/A	N/A
MOBILE Laboratory	Second Tier	N/A	N/A
DIAGNOSTIC Laboratory	Fourth Tier	N/A	N/A
ANALYTICAL Laboratory	Bottom Tier	N/A	N/A

Survey Source

Vendor Supplied Information

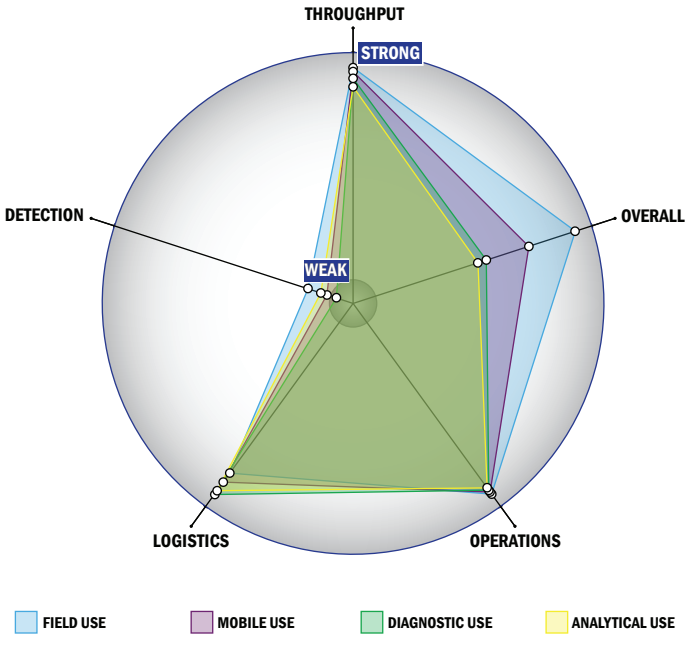
Scoring Analysis

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.



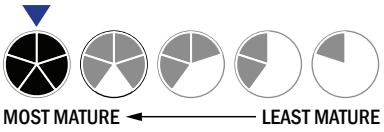
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- Continuous operation with no defined runs
- 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
- Less than 5 minutes is required for set-up
- Automatic detection

Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a toaster
- Between 1 and 5 kg
- Wireless and wired connections are available
- System or device uses batteries
- 4-8 hours battery life



Operations:

- Can be used from -21°C to 41°C
- Performance is not influenced by relative humidity
- 5-10 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:

- 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
- This system does not test liquids
- Superior specificity. System has a false alarm rate approaching zero (~0%)
- Spore lysis not necessary for detection by system