# TSI Incorporated - Fluorescence Aerosol Particle Sensor (FLAPS III™) Model 3317

## GENERAL DESCRIPTION:


TSI Fluorescence Aerosol Particle Sensor (FLAPS III™) Model 3317 The TSI FLAPS III™ Model 3317 employs fluorescence measurements on individual airborne particles for rapid biological threat detection (under one minute response time) in military and homeland defense applications where a trigger detector is required for biological point detection systems. The instrument delivers exceptional threat discrimination and interference rejection using real-time processing of the data with advanced alarm algorithms. It has been tested with standard simulants for bio-threat agents (spore & vegetative bacteria, viruses and toxins), and has undergone significant field testing to verify its performance. The instrument is designed for field operation in terms of reliability, maintainability, and serviceability. (A predecessor instrument, the TSI UVAPS Model 3312A, has been fielded in the US Army P3I-BIDS enclosure.) The TSI FLAPS III™ Model 3317 system simultaneously measures for each individual airborne particle, the scattered-light intensity and the fluorescence emissions in two wavelength regions. These single particle measurements provide a robust data set for the rapid detection of airborne biological threat agents under various background environments. The instrument is generally used with a front-end aerosol concentrator to optimize performance, and is available in a stand-alone environmental enclosure with radio communications for remote operation. It has been in production since early 2004. The TSI FLAPS III™ Model 3317 is developed under sole license of U.S. patent numbers 5701012, 5895922 , and 6831279 from the Canadian Department of Defense.

## TECHNICAL DESCRIPTION:

The detection of biological aerosols by the TSI FLAPS III™ Model 3317 is based on UV laser-induced fluorescence. The instrument uses a simplified optical train with a single, commercially available 405nm CW laser diode for both excitation and optical sizing (nominal lifetime of 10,000 hours of continuous operation). An opposed nozzle design, consisting of an inlet nozzle and an outlet nozzle, prevents particle recirculation in the optical chamber, and is used together with HEPA-filtered sheath air flow to eliminate fouling of the optical components. Measurements are taken on individual particles in the aerosol stream.

## CONTACT INFORMATION

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## COST

- $100,000/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**

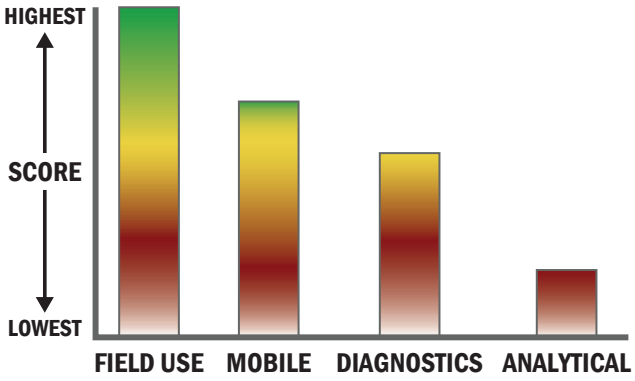
| | Biological | Chemical | Radiological |
|---|---|---|---|
| **FIELD USE** System | | N/A | N/A |
| **MOBILE** Laboratory | | N/A | N/A |
| **DIAGNOSTIC** Laboratory | | N/A | N/A |
| **ANALYTICAL** Laboratory | | N/A | N/A |

## Survey Source

Vendor and Internet Supplied Information

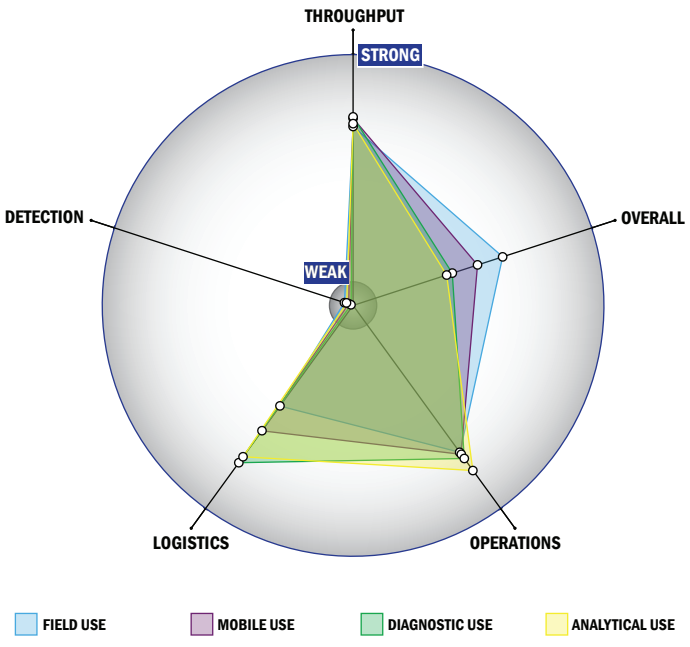
## Scoring Analysis

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.



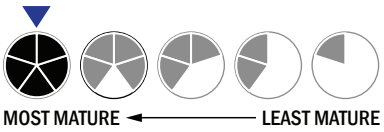

## Evaluation Criteria

### Throughput:

- 2 minutes or less for detection
- System is continuous and provides real time analysis with no defined tests/samples
- The system or device is currently fully automated
- 0-1 solutions, buffer, eluents, and/or reagents
- Less than 5 minutes is required for set-up
- 1-2 steps are required for detection

### Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Larger than a home dishwasher
- Between 5 and 25 kg
- Wired connections are available
- System or device has 110V electrical requirement




### Operations:

- Can be used from 4°C to 41°C
- Performance is not influenced by relative humidity
- 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:

- This system does not test liquids