

Mine Safety Appliances Co. (MSA), Inc. - SAFESITE MTX (Multi-Threat Monitor)



GENERAL DESCRIPTION:

The SAFESITE® Multi-Threat Wireless Detection System monitors, detects and communicates the presence of up to six potential threats, including chemical warfare agents (CWA), gamma radiation, volatile organic compounds (VOC), toxic industrial chemicals (TIC), combustible gas and oxygen deficiency, and operates within a wireless network.



- Toxic Industrial Chemicals – Detects for many (TICs) such as chlorine ammonia hydrogen cyanide and hydrogen chloride
- Gamma Radiation – and μ to m REM levels
- Volatile Organic Compounds - Uses a Photoionization detector 10.6 eV ionization source to detect chemicals
- Chemical Warfare Agents – Uses a SAW array to detect both nerve and blister agents. Excellent false positive resistance and sub mg/m³ detection levels.
- Integrated GPS for automatic sensor position on GIS charts
- Compatible with ADASHI OptiMetrics 1st Responder Software –chemical plume modelling and weather integration.
- SAFESITE MTX monitor is designed as an open architecture data communication platform.

TECHNICAL DESCRIPTION:

This sensor uses different technologies to meet the mission requirement, electrochemical sensor, catalytic, photoionization, CZT, Geiger Muller and Surface Acoustic Wave (SAW) array.

CONTACT INFORMATION

MSA
1000 Cranberry Woods Drive
Cranberry Township, PA 16066

COST

- \$40,000/system
- <\$1/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	Second Tier	Second Tier
MOBILE Laboratory	N/A	Second Tier	Third Tier
DIAGNOSTIC Laboratory	N/A	Second Tier	Third Tier
ANALYTICAL Laboratory	N/A	Second Tier	Third Tier

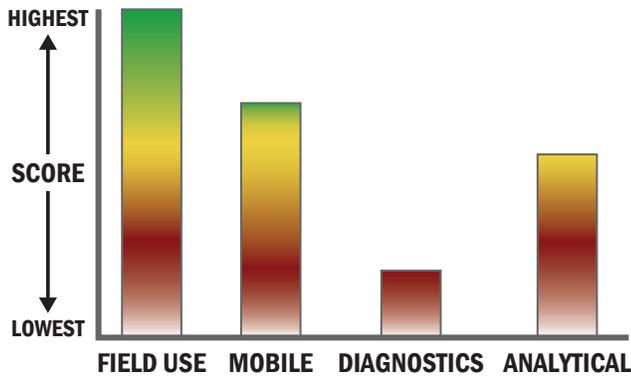
Survey Source

Vendor and Internet Supplied Information



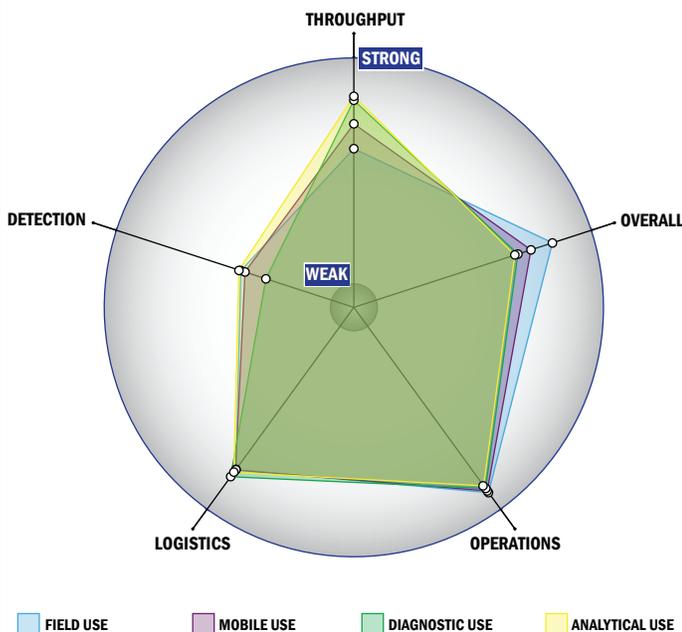
Scoring Analysis

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.



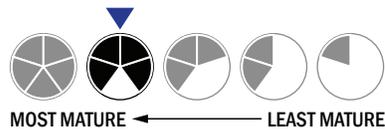
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- Multiple samples, multiple tests/sample per run
- System is continuous and provides real time analysis with no defined tests/samples
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 5 or more solutions, buffer, eluents, and/or reagents
- 1 component
- 5-10 minutes is required for set-up
- 1-2 steps are required for detection

Logistics:

- An afternoon of training and some technical skills required
- 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 $< -21^{\circ}\text{C}$ to $> 42^{\circ}\text{C}$ (All temperatures)
- Performance is not influenced by relative humidity
- Greater than 3 years shelf life
- 3-5 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is open and available for modification
- The system hardware is open and available for modification

Detection:

- This system does not test liquids
- Superior specificity. System has a false alarm rate approaching zero ($\sim 0\%$)
- $> 1 \times 10^{-3} \text{ mg/m}^3$
- 1 ppb-1 ppm
- System currently can identify aerosolized chemical agent
- Possible the system could identify liquid chemical agent
Only dose rate
- Display indicates 0 until more than 1 mR/hr is detected for dose rate
- System is used for area air sampling