



# Bertin Technologies - KIM

## GENERAL DESCRIPTION:

Bertin Technologies (France) has developed the system KIM (Kits of Immuno-agglutination on Microbeads) dedicated to the detection of warfare agents. The system is composed of a field analyzer and detection kits. KIM technology enables a rapid homogeneous and sensitive bioanalysis. Within 10 minutes,



air samples (e.g. collected with Bertin's Coriolis® air-sampler) could be analyzed without any further preparation. Field-compatible preparation kits have been developed to ensure the compatibility of following samples with the system KIM: powders, surface swab samples, river waters. The KIM system is dedicated to first responders. Procedures have been simplified to be easily performed by users without technical expertise. The analyzer has been conceived for field application in terms of weight, solidity, autonomy, compatibility with standard decontamination procedures.

## TECHNICAL DESCRIPTION:

The detection principle consists in accelerating traditional immuno-agglutination on antibody-grafted microbeads by using magnetic Brownian colloids. These microbeads have self-organization properties under a homogenous magnetic field: they self-assemble into linear chains, and the resulting one-dimensional confinement drastically speed-up the recognition rate between the grafted antibodies and the antigen (Baudry et al.. Proc Natl Acad Sci U S A. 2006 Oct 31;103(44):16076-8). The agglutination process can be monitored by the variation of the Optical Density after magnetic field application to the sample: this measurement relies on the fact that a doublet of microbeads scatters more light than two separate beads.

## CONTACT INFORMATION

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## COST

- \$60,000/system
- \$100/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
<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

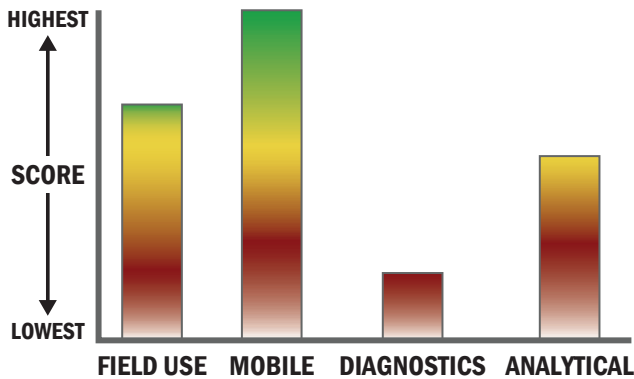
## Survey Source

Vendor and Internet Supplied Information



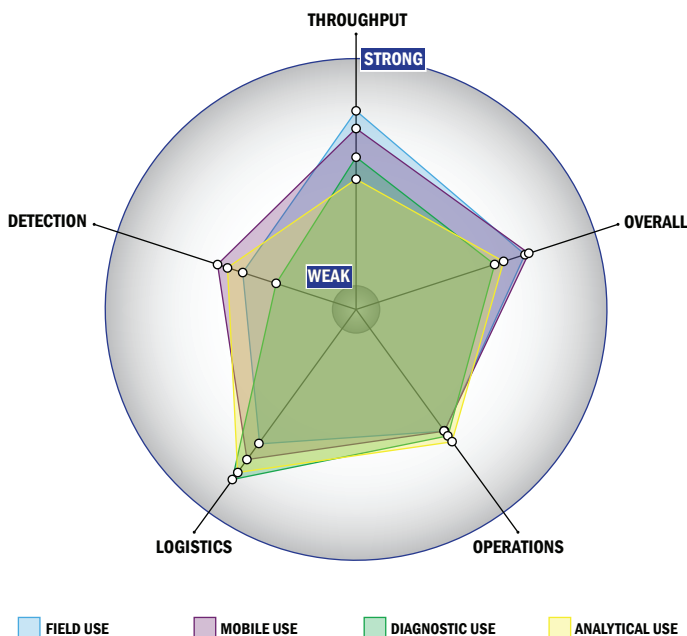
## Scoring Analysis

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.



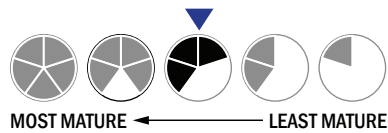
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- 1 sample, single test/sample per run
- System is continuous and provides real time analysis with no defined tests/samples
- Device or system is intended for multiple detection assays
- 2 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:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a carry-on luggage suitcase
- Between 5 and 25 kg
- Wired connections are available
- System or device uses batteries
- 2-4 hours battery life



### Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at room temperature (27 °C)
- Between 6 months and 1 year shelf life
- 5-10 years expected life
- Results cannot 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 250 µL
- 10,000-100,000 CFU per mL
- 10,000-100,000 PFU per mL
- Less than 1 ng per mL
- Spore lysis not necessary for detection by system
- Spore lysis not necessary for detection by system