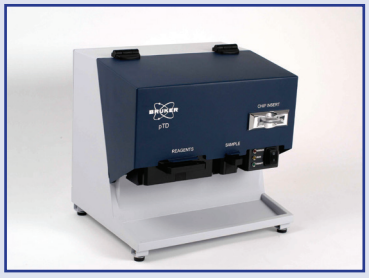
Bruker Detection Corporation - pTD

GENERAL DESCRIPTION:



The portable Toxin Detector (pTD) allows the rapid, specific and sensitive identification of toxins, which are relevant as biological warfare agents. Application of the ready-to-use pTD Toxin Test Kit BWA I allows the parallel detection of botulinum neurotoxins (BoNT/A, BoNT/B, BoNT/E), staphylococcal enterotoxin B and ricin within less than 25 min in an automated process. A decontamination procedure is integrated in the assay ensuring secure operation of pTD. The system is intended for the on-site analysis of toxins in mobile labs and on-board vehicles. pTD Control is the control and analysis software of the pTD system. The user monitors and controls the startup and shut down of the device as well as the selection and the progress of methods via pTD Control. The results of each analysis are displayed automatically in pTD Control using a traffic light-based color code. Red traffic light is shown together with the warning note that a target was found after identification of a toxin. Data evaluation is realized automatically. Integrated positive and negative control electrodes allow normalization of target electrode signals. This ensures reproducibility of electrochemical toxin detection within different chip batches. The pTD is a platform technology and extendable to address new threats. In addition to toxin detection, first promising results for detection of bacteria and viruses via PCR and nucleic acid hybridization were obtained. Integration of a PCR chamber in pTD will allow nucleic acid amplification and detection of several BWA related microorganisms in parallel.

TECHNICAL DESCRIPTION:

The detection principle is based on an ELISA procedure. Capture antibodies immobilized on gold electrodes facilitate the specific binding of corresponding toxins. Detection of bound toxins is realized by application of a detector-antibody-enzyme conjugate and measurement of the electrical current of an enzymatic redox reaction. The detection event is strongly amplified in this system and allows sensitive toxin identification (low ng/mL-range) in less than 25 minutes. First, the high turnover of enzymatic reaction contributes to the signal amplification and second, a redox recycling procedure built into the experimental procedure, provides a second signal amplification.

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

CONTACT INFORMATION

Bruker Detection Corporation
Division of Bruker Daltonik GmbH
Permosersr. 15
Leipzig, D-04318 Germany

COST

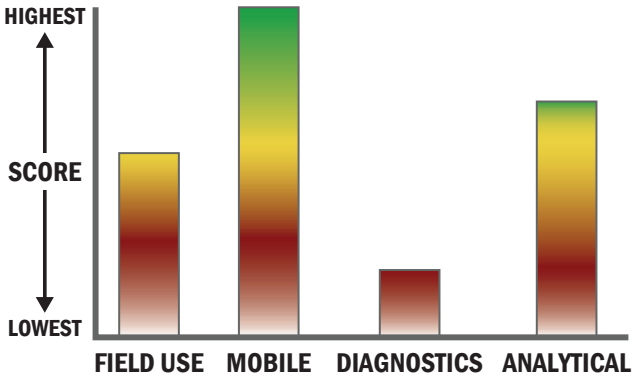
N/A

Survey Source

Vendor and Internet Supplied Information

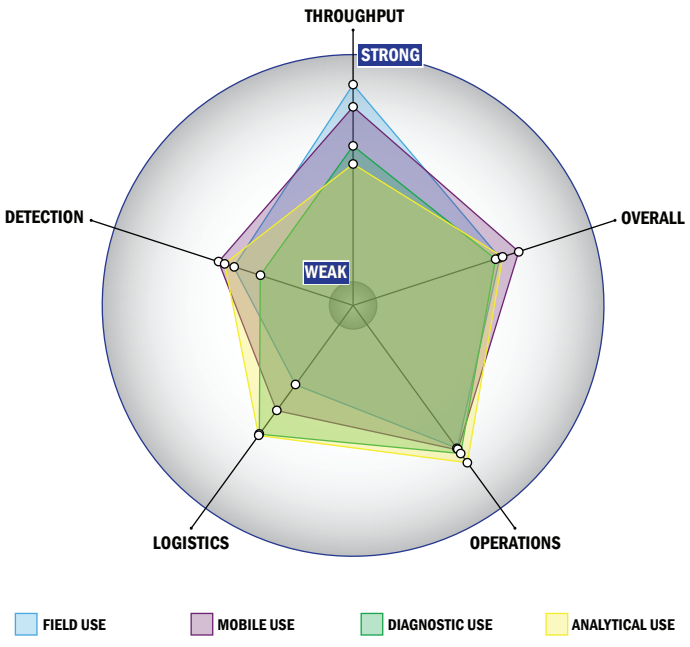
Scoring Analysis

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.



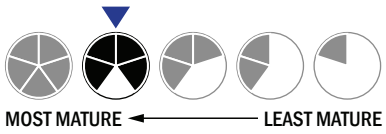
Evaluation Criteria

Throughput:

- Between 15 and 30 minutes for detection
- 1 sample, <10 tests/sample per run
- Less than 32 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
- No set-up of the system 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 has 110V electrical requirement



Operations:

- Can be used from 4 °C to 37 °C
- Components must be stored at 4 °C
- Performance is not influenced by relative humidity
- Between 6 months and 1 year shelf life
- Results can be viewed in real-time
- The system is not capable of autonomy
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

Detection:

- Less than 10 µL
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- Less than 1 ng per mL
- Manual kit not integrated with the system handles spore lysis