

Agilent Technologies, Inc. - Agilent 6500 Series Quadrupole Time of Flight Mass Spectrometer



GENERAL DESCRIPTION:

The 6500 series instruments are quadrupole time of flight mass spectrometers (QTOF) designed to be coupled to liquid chromatography systems for sample separation and introduction. They provide accurate mass (<1 ppm mass error) and high resolution (>42,000 FWHM) required for compound identification. They are compatible with a wide-range of ionization techniques, please contact POC for more information. The 6500 series instruments can be used to identify unknown compounds, confirm identity of compounds or determine how much of a compound is present in samples.



TECHNICAL DESCRIPTION:

The 6500 series is comprised of 3 different models of QTOF mass spectrometer with a variety of performance characteristics to meet any budgetary and/or application need. The 6520 is the workhorse QTOF instrument, providing 2 ppm mass accuracy and 20,000 FWHM resolution suitable for most routine analyses. The 6540 instrument provides 1 ppm mass accuracy and 40,000 resolution for those more demanding applications. Designed for the most challenging assays, the 6550 QTOF with Ion Funnel Technology provides <1 ppm mass accuracy and >40,000 FWHM resolution and is the most sensitive accurate mass instrument available. All 6500 series QTOF instruments incorporate the following technology:

- Proprietary orthogonal spray ion source maximizes ion generation and reduces noise, while maintaining excellent accurate mass with automated introduction of an internal reference mass.
- Pioneering design of the collision cell and ion optics allows same reference mass calibration to be used for both MS and MS/MS. Resulting MS mass accuracy and precise isotopic ratios greatly improve confidence in molecular formula generation.
- Proprietary INVAR flight tube sealed in vacuum-insulated shell eliminates thermal mass drift due to temperature changes, maintaining excellent mass accuracy, 24/7.
- Analog-to-digital (ADC) detection records multiple ion events, allowing very accurate mass assignments over a wide mass range and dynamic range of concentrations.
- 4GHz ADC electronics enable high sampling rate (32 Gbit/s), improving resolution, mass accuracy, and sensitivity for low-abundance samples.
- Dual gain amplifiers simultaneously process detector signals through both low-gain and high gain channels, extending dynamic range to 10x5.

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
MOBILE Laboratory	●	◐	N/A
DIAGNOSTIC Laboratory	○	◐	N/A
ANALYTICAL Laboratory	◐	◐	N/A

Survey Source

Vendor Supplied Information

CONTACT INFORMATION

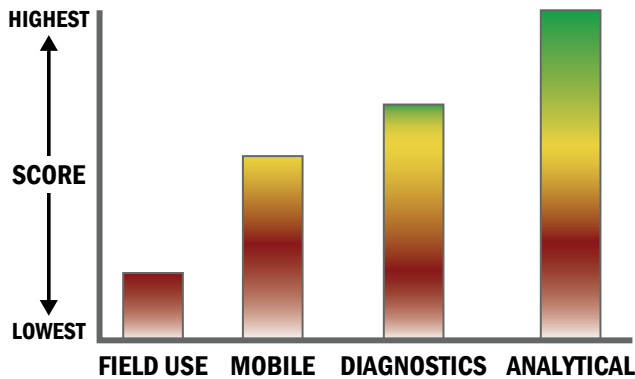
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COST

- \$525,000/system
- N/A/analysis

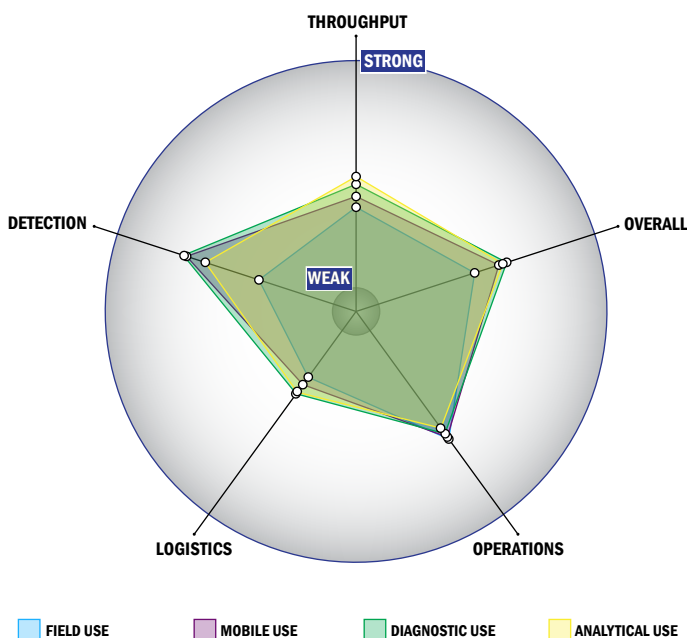
Scoring Analysis

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.



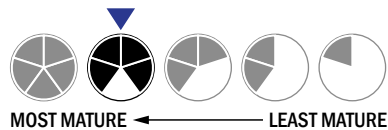
Evaluation Criteria

Throughput:

- Between 15 and 30 minutes for detection
- Multiple samples, multiple tests/sample per run
- 95-32 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
- Greater than 20 minutes is required for setup
- Almost instantaneous detection

Logistics:

- More than a day of training and significant technical skills are required
- Approximately the size of a home dishwasher
- More than 50 kg
- Wireless and wired connections are available
- System or device has 220V electrical requirement



Operations:

- Can be used from 4 °C to 37 °C
- Components must be stored at room temperature (27 °C)
- Device or system has peak performance at normal relative humidity conditions
- 5-10 years expected 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:

- 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
- Superior specificity. System has a false alarm rate approaching zero (~0%)
- < 1 ppb
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent