



INDUCTIVELY COUPLED PLASMA EMISSION SPECTROSCOPY (ICP- OES) - TORONICP™ OES9000 PRO (ADVANCED AUTOMATION)

Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) – ToronICP™ OES9000 PRO (Advanced Automation) delivers fast, precise elemental analysis with full automation and high-throughput reliability.

APPLICATIONS

Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) – ToronICP™ OES9000 PRO (Advanced Automation)

Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) – ToronICP™ OES9000 PRO is a high-performance inductively coupled plasma spectrophotometer engineered for fast, accurate, and fully automated elemental analysis across a wide concentration range. By generating a stable, high-temperature inductively coupled plasma, the system efficiently excites atoms in liquid samples and analyzes their characteristic emitted light to determine precise elemental concentrations.

This advanced inductively coupled plasma emission spectroscopy system combines bidirectional plasma observation, full-spectrum direct-reading optics, and intelligent online monitoring to deliver reliable, high-throughput results. Automated control of gas flow, cooling, power management, and safety interlocks enables true unmanned operation, helping laboratories improve productivity, maintain data integrity, and enhance overall operational safety.



Applications

The Inductively Coupled Plasma Emission Spectroscopy – ToronICP™ OES9000 PRO is suitable for:

- Environmental monitoring, including water, wastewater, and soil analysis
- Food safety and agricultural testing, for trace element determination
- Geology and mineral exploration, including ores and rare earth elements
- Metallurgy and materials science, for macro, micro, and trace analysis
- Petroleum and petrochemical laboratories, including fuels and additives
- Chemical engineering and industrial quality control
- Semiconductor and electronic materials analysis
- Research laboratories, requiring high throughput and automation



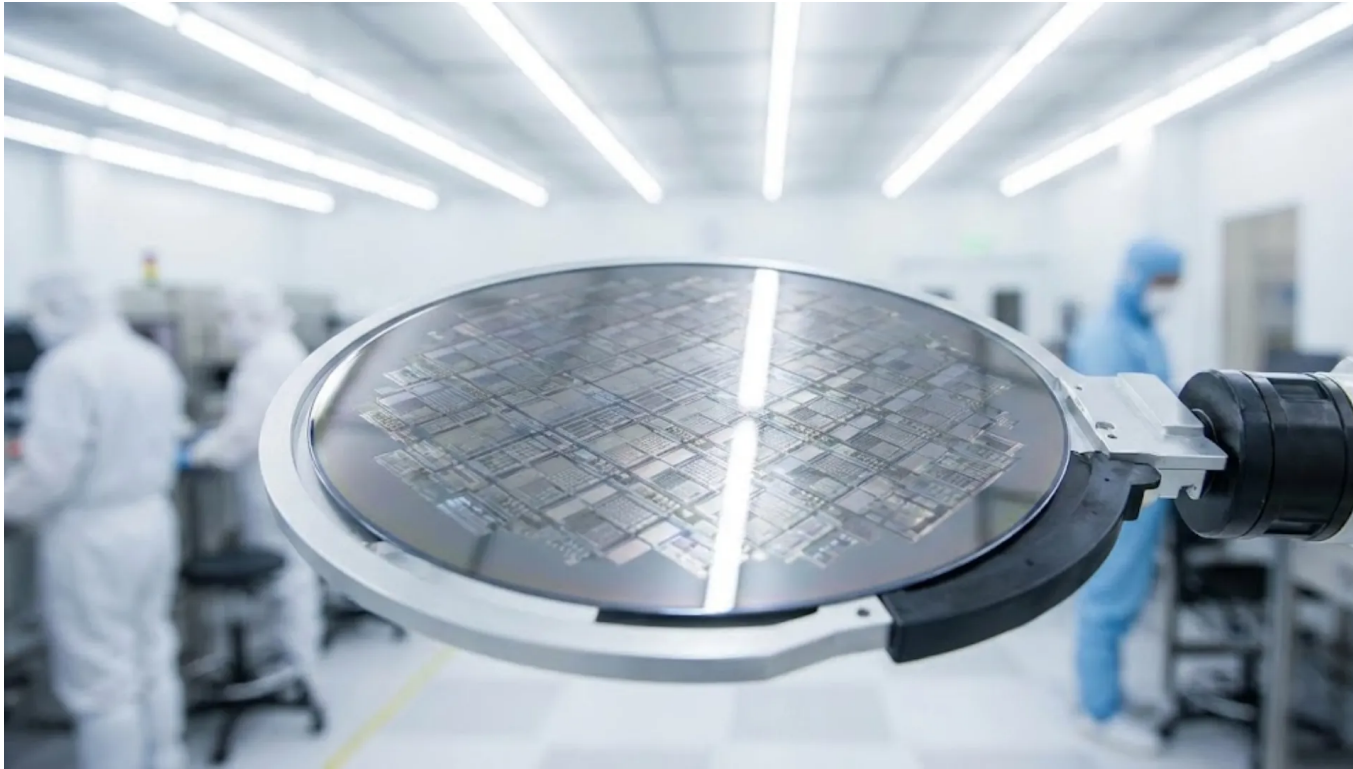












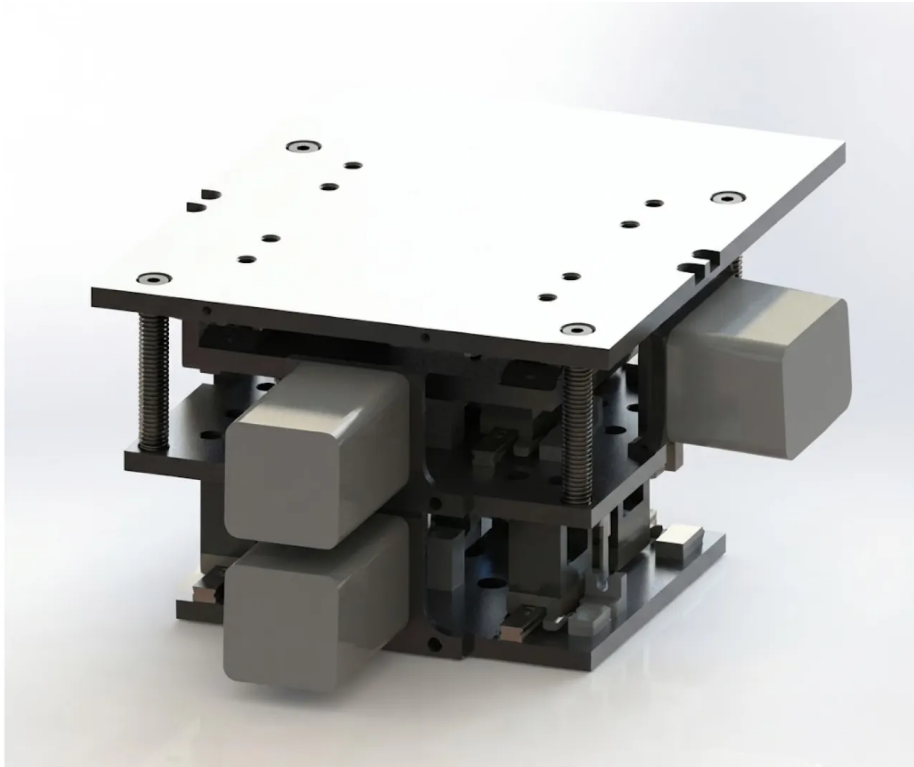


FEATURES

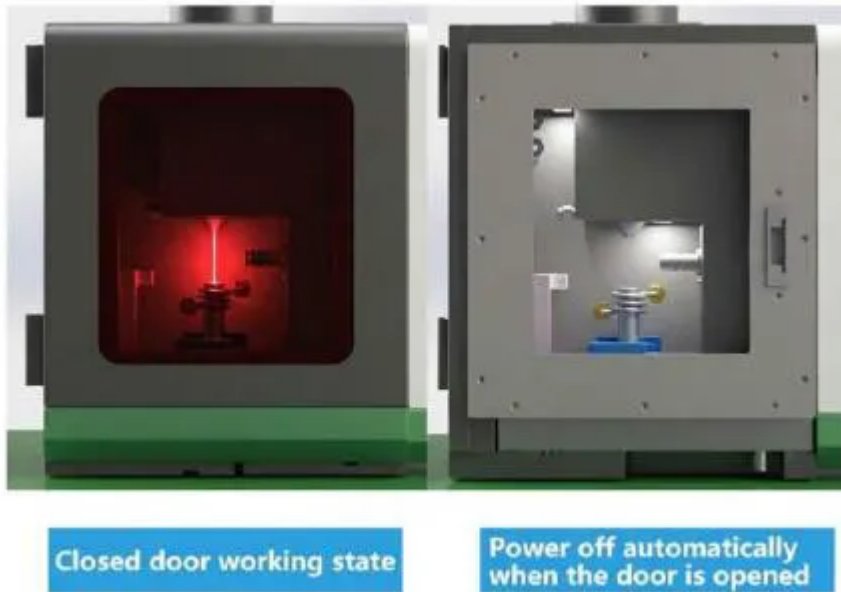
Inductively Coupled Plasma Emission Spectroscopy – ToronICP™ OES9000 PRO (Advanced Automation) Key Features

- Inductively coupled plasma emission spectroscopy (ICP-OES) with full-spectrum direct reading
- Bidirectional plasma observation for high sensitivity and reduced matrix interference
- Unmanned operation capability, supporting automated startup, analysis, and shutdown
- Online monitoring automation, tracking voltage, current, gas pressure, temperature, and airflow
- Simultaneous multi-element analysis, testing over 70 elements in a single injection
- Fast analysis speed, with one sample analyzed in approximately one minute
- Low detection limits, reaching ppb-level sensitivity

- Wide linear dynamic range, up to 5-6 orders of magnitude
- Automatic power-off safety interlock, triggered when the instrument door is opened
- Fully automatic 3D mobile platform, enabling precise plasma observation positioning
- Reduced chemical interference, improving accuracy and result reliability



Fully Automatic 3D mobile platform



Automatic power off upon door opening interlock

THEORY & METHOD

Theory

Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) is a powerful method for elemental analysis. This technique utilizes an extremely hot, stable plasma, generated by energizing argon gas with a radio-frequency electromagnetic field, which can reach temperatures exceeding 10,000 K.

The process involves converting liquid samples into a fine aerosol and introducing them into this high-temperature plasma. Within the plasma, the elements in the sample become excited and subsequently emit light at specific wavelengths unique to each element. An inductively coupled plasma spectrophotometer then detects this emitted light, allowing for the simultaneous identification and precise quantification of multiple elements.

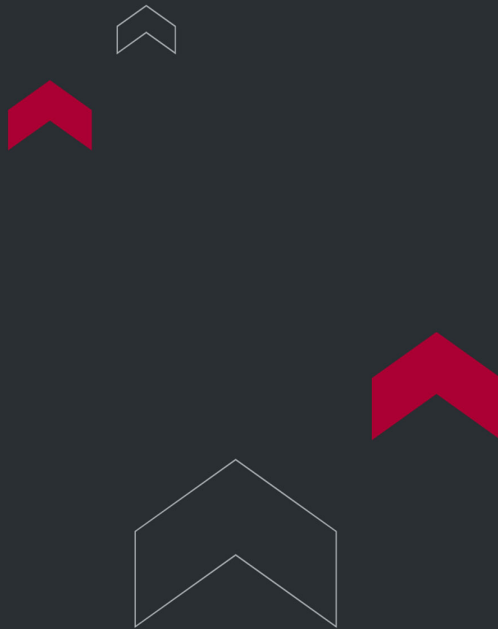
ICP-OES is highly valued for its speed, accuracy, high sensitivity, minimal chemical interference, and broad linear measurement range. These characteristics make it a reliable and versatile tool across various fields, including environmental monitoring, metals analysis, industrial quality control, and scientific research.

TECHNICAL SPECIFICATIONS

Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) - ToronICP™ OES9000 PRO (Advanced Automation) Technical Specifications

Model	ToronICP™ OES9000 PRO
Analytical Technique	Inductively Coupled Plasma Emission Spectroscopy (ICP-OES)
Instrument Type	Inductively Coupled Plasma Spectrophotometer
Optical System	Full-spectrum, direct reading
Plasma Observation	Bidirectional (Axial and Radial)
Elements Measured	Over 70 elements
Detection Limit	Down to ppb level
Analysis Speed	Approximately 1 sample per minute
Linear Dynamic Range	Up to 5-6 orders of magnitude

Automation Level	Fully automated, supports unmanned operation
Monitoring System	Online monitoring of voltage, current, gas pressure, airflow, temperature
Safety Features	Door opening interlock with automatic power shutdown
Positioning System	Fully automatic 3D mobile observation platform
Typical Applications	Environmental, food, metallurgy, petrochemical, research



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