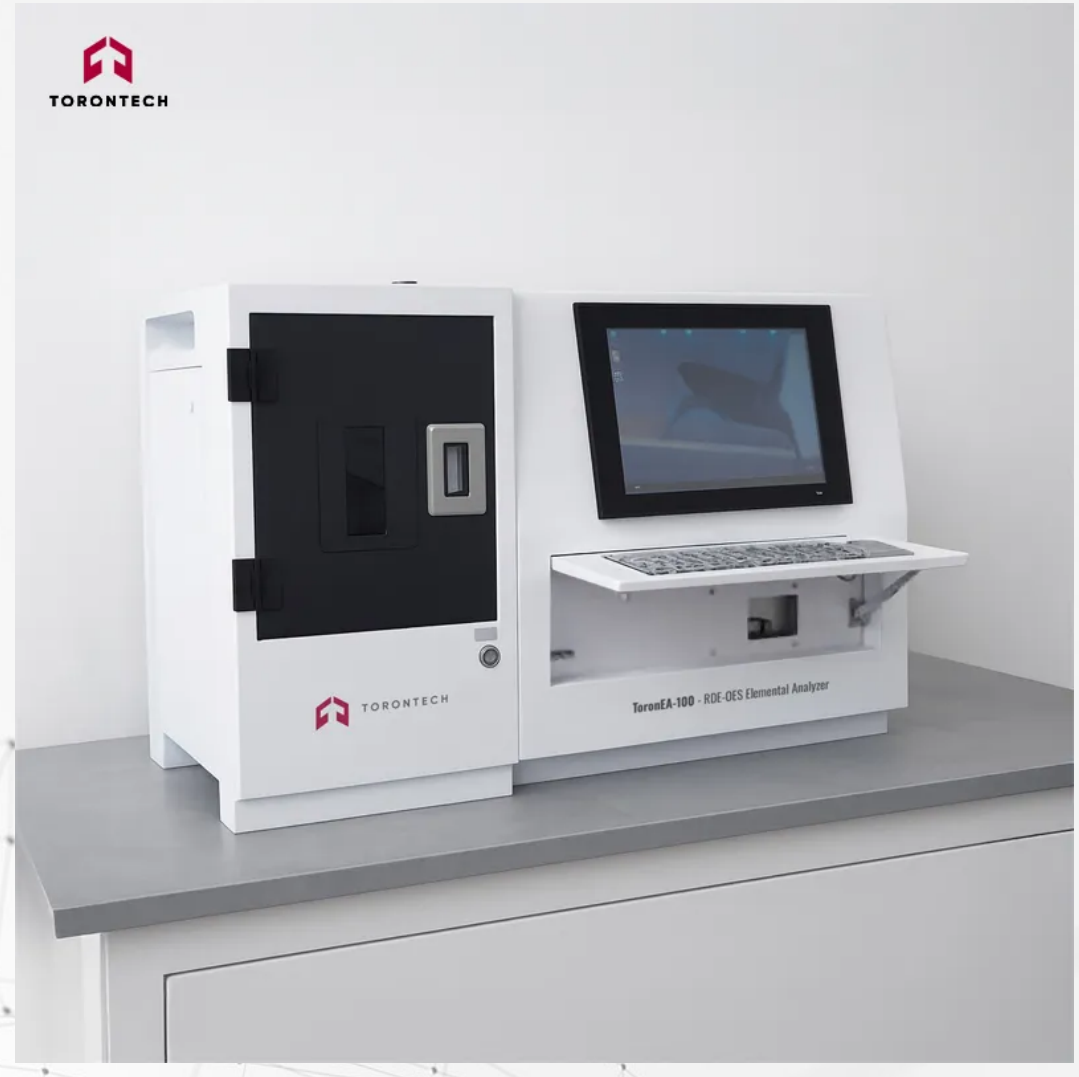
TORONTECH



RDE-OES ELEMENTAL ANALYZER - TORONEA™ 100

RDE-OES Elemental Analyzer - ToronEA™ 100

The RDE-OES elemental analyzer ToronEA™ 100 gives maintenance teams and field laboratories a compact way to screen lubricating oils, hydraulic fluids, and fuels for wear metals and contaminants. The instrument houses its optical bench, control computer, and electrode grinder in a single benchtop unit, so a single piece of equipment covers the full testing workflow without external components to install or wire together. Technicians on ships, remote sites, and small labs use it where space and setup time are limited.

The ToronEA™ 100 pairs a Paschen-Runge optical structure on a Roland circle mount with a 500 mm focal length, reading spectral lines across a 190 to 800 nm range with a solid-state CCD detector. This configuration holds detection limits below 1 ppm across 24 elements, with capacity to expand coverage to 32 elements. A digital arc light source keeps excitation current stable from test to test, so results stay consistent without regular recalibration.

Torontech built the ToronEA™ 100 for environments where reliability under variable conditions matters as much as raw throughput. The unit starts quickly, handles ambient temperatures from 0°C to 55°C, and connects through a built-in scanning gun, Bluetooth module, and RS-485 interface with no extra configuration needed. That combination makes it a practical fit for shipboard testing stations and field labs running routine wear metal screening.

APPLICATIONS

RDE-OES Elemental Analyzer - ToronEA-100

RDE-OES Elemental Analyzer - ToronEA™ 100 Applications

The ToronEA™ 100 fits testing programs where equipment needs to travel to the sample rather than the other way around.

- Marine and Shipboard Oil Testing: analyzes engine and hydraulic oils on board vessels, where a compact footprint and quick startup matter more than lab-scale throughput
- Military and Defense Field Testing: supports condition monitoring for ground, naval, and aviation equipment in deployed or remote testing stations
- Space and Aerospace Ground Support: screens hydraulic and lubricant systems supporting launch and ground equipment where component failure carries high mission risk
- Electric Power Generation: monitors turbine and generator lubricants during routine maintenance rounds at power plants
- Transportation Fleet Maintenance: checks engine and transmission oils across trucking, rail, and marine fleets to catch component wear between scheduled services
- Remote and Mobile Laboratories: provides direct, reagent-free oil analysis for field crews and mobile testing units without access to a full stationary lab
- Predictive Maintenance Programs: tracks wear metal trends over time to flag developing mechanical issues before they cause unplanned downtime

Standards

The ToronEA™ 100 tests to internationally recognized methods for rotating disc electrode atomic emission spectrometry, giving field and lab teams results consistent with commercial oil analysis programs.

- ASTM D6595 - Standard Test Method for Determination of Wear Metals and Contaminants in Used Lubricating Oils or Used Hydraulic Fluids by Rotating Disc Electrode Atomic Emission Spectrometry
- ASTM D6728 - Standard Test Method for Determination of Contaminants in Gas Turbine and Diesel Engine Fuel by Rotating Disc Electrode Atomic Emission Spectrometry

FEATURES

RDE-OES Elemental Analyzer - ToronEA™ 100 Key Features

The ToronEA™ 100 concentrates on portability and dependable operation for testing away from a fixed lab.

- All-in-One Benchtop Design: integrates the optical bench, control computer, and electrode grinder into a single compact unit, cutting setup time and equipment footprint
- Stable Digital Arc Excitation: a solid-state, patented excitation source holds current output steady, reducing the cleaning and adjustment that older spark sources need
- High-Resolution CCD Detection: a 3,648-pixel solid-state sensor array with 8 × 200 µm pixel size captures effective spectral intensity for reliable trace-element readings
- Reagent-Free Direct Sampling: tests oil straight from the sample cup, with no argon, oxygen, or chemical solvents required
- Wide Operating Temperature Range: rated for 0°C to 55°C ambient conditions, supporting use in unheated or variable-climate testing spaces
- Built-In Connectivity: a scanning gun, Bluetooth module, and RS-485 interface come standard, so the unit works without additional configuration or accessories
- Cross-Platform Analysis Software: Windows-based software handles instrument control, data management, and qualitative and quantitative analysis across Windows 7, Windows 10, and other supported systems

THEORY & METHOD

Theory and Method

The ToronEA™ 100 identifies elements in an oil sample by striking a spark between a graphite disc electrode and a counter electrode while the disc rotates through the sample cup. The rotation carries a thin film of oil into the spark gap on every pass, so the discharge always meets fresh material instead of burning through the same spot repeatedly.

The spark supplies enough energy to vaporize metal particles and ions in the oil film and push their electrons into higher energy states. As those electrons drop back down, they release light at wavelengths specific to each element, the same emission behavior that underlies atomic emission spectroscopy generally. The Paschen-Runge optical structure, arranged on a Roland circle with a 500 mm focal length, separates this light by wavelength and directs each element's signal to a fixed position on the CCD detector.

Because the detector array captures multiple wavelengths simultaneously rather than scanning through them one at a time, the ToronEA™ 100 reads a full multi-element profile in a single spark burst. The software then converts detector signal strength at each position into a concentration value using a stored calibration curve, without requiring the sample to be diluted, digested, or otherwise altered before testing.

TECHNICAL SPECIFICATIONS

RDE-OES Elemental Analyzer - ToronEA™ 100 Technical Specifications

Parameter	Specification
Optical Structure	Paschen-Runge structure, Roland circle mount
Optical Focal Length	500 mm
Spectral Range	190-800 nm
Detector	CCD, 3,648 pixels, 8 × 200 µm pixel size

Detection Limit	Less than 1 ppm
Test Cycle Time	30 seconds
Detectable Elements	24 standard, expandable to 32
Measuring Range	0-6,000 ppm
Operating Temperature	0°C to 55°C
Connectivity	Built-in scanning gun, Bluetooth module, RS-485 interface
Power Source	AC 220V ±10%, 50/60 Hz (110V also available)
Dimensions (L × W × H)	770 × 360 × 540 mm
Weight	Approximately 78 kg

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