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eraoil

RDE-OES SPECTROMETER FOR ELEMENTAL ANALYSIS

Standards
ASTM D6595, ASTM D6728

Excellent correlation to ICP-AES
ASTM D5185

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era**oil** – Fast & Easy Wear Metal Analysis

Wear metals, additives, contaminants

era**oil** is the first and most advanced stand-alone rotating disc electrode spectrometer analyzing wear metals, additives, and contaminants in all kinds of operating liquids, like lubricating oils, fuels, heavy fuel oil (HFO), coolants, process water, etc. Up to 32 elements are measured fully automatically within 30 seconds. era**oil**'s high end CMOS detector in combination with the automatic back-ground correction allow for a sub-ppm detection limit (LOD) for most elements.

Smallest footprint with built-in PC

era**oil**'s unique stand-alone design offers a rugged all-in-one package for operation even in smallest on-site testing labs. It comes with a built-in 10" color touchscreen and a PC.

Even an electrode sharpener and an automatic ventilation system are integrated in the era**oil**. Still, it is the RDE-OES analyzer with the smallest footprint on the market.

era**oil** is very easy to use even for untrained operators. The automated measuring procedure follows simple steps and is therefore perfect for on-site inspection: Just fill the sample cup, close the door, and push the start button. The elemental concentration is available immediately.

High-precision oil & fuel analysis

era**oil** is fully compliant with ASTM D6595 (Oil) and ASTM D6728 (Fuel). ASTM D6595 is the standard for identifying wear metals and contaminants in used lubricating oils and used hydraulic fluids by rotating disc electrode atomic emission spectrometry. For determining contaminants in gas turbine and diesel engine fuel, ASTM D6728 is the standard of choice.

To protect finished fuels and heavy fuel oil (HFO) against trace contamination era**oil** is available with the special Low Detection Fuel Module to detect e.g. Potassium, Lithium, Sodium and Vanadium at LOD levels of as low as 0.1 ppm.

Superior precision data outperforming ASTM D6595

ELEMENT	r @ 10 ppm
Ag | Ba | Ca | Li | Mg | Mn | Na | Si | Zn	0.1
Al | B | Cd | Cr | Cu | Fe | K | Ni | Ti | V	0.2
Mo | Pb | Sn	0.3
Bi | In	0.4
P	0.5
Sb	0.8

Typical era**oil** repeatability (SD) @ 10 ppm.

Applications

Multi-elemental analysis is the core of in-service oil analysis. era**oil** is the perfect solution for wear metal analysis of lubricants from engines, transmissions, hydraulic systems and gears boxes. The fast and easy elemental analysis brings clear advantages for the operation of any commercial means of transport or machines in the industrial environment. This solution also offers clear added value for other applications such as coolants, metal working fluids, or any other process fluids.

Features at a glance

- **Wear metals, contaminants and additives** in lubricating oils and hydraulic fluids according to ASTM D6595 and contaminants in gas turbine and engine fuel according to ASTM D6728
- Up to **32 elements** in **30 seconds** with **sub-ppm** LOD
- **Stand-alone** design with built-in PC, touchscreen, sharpener & ventilation
- **Smallest** and **most rugged** housing for lab and on-site applications
- Compared to traditional ICP spectroscopy, the RDE-OES elemental analysis does not require sample preparation and **no carrier/plasma gas**

WEAR METALS AND CONTAMINANTS

ELEMENT	LUBRICANT ASTM D6595	LUBRICANT EXT. ELEMENT	LUBRICANT EXT. RANGE	FUEL ASTM D6728	LOW DET. FUEL	COOLANT	WATER
Silver (Ag)	0 – 1000	0 – 1000	0 – 1000				0 – 10
Aluminium (Al)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 50	0 – 10
Arsenic (As)		0 – 100					
Boron (B)	0 – 1000	0 – 1000	0 – 1000			0 – 1000	0 – 10
Barium (Ba)	0 – 1000	0 – 1000	0 – 6000				
Bismuth (Bi)	0 – 1000	0 – 1000	0 – 1000				
Calcium (Ca)	0 – 1000	0 – 1000	0 – 6000	0 – 1000	0 – 100	0 – 50	0 – 10
Cadmium (Cd)	0 – 1000	0 – 1000	0 – 1000				0 – 10
Cerium (Ce)		0 – 100					
Cobalt (Co)		0 – 100					0 – 10
Chromium (Cr)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100		0 – 10
Copper (Cu)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 50	0 – 10
Iron (Fe)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 50	0 – 10
Indium (In)	0 – 1000	0 – 1000	0 – 1000				
Potassium (K)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 1000	0 – 10
Lithium (Li)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100		
Magnesium (Mg)	0 – 1000	0 – 1000	0 – 6000	0 – 1500	0 – 300	0 – 50	0 – 10
Manganese (Mn)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100		0 – 10
Molybdenum (Mo)	0 – 1000	0 – 1000	0 – 1000			0 – 500	
Sodium (Na)	0 – 1000	0 – 1000	0 – 6000	0 – 1000	0 – 100	0 – 1000	0 – 10
Nickel (Ni)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100		0 – 10
Phosphorus (P)	0 – 1000	0 – 1000	0 – 6000			0 – 2500	0 – 10
Lead (Pb)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 50	0 – 10
Antimony (Sb)	0 – 1000	0 – 1000	0 – 1000				
Silicon (Si)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100	0 – 500	0 – 10
Tin (Sn)	0 – 1000	0 – 1000	0 – 1000				0 – 10
Strontium (Sr)		0 – 100					
Titanium (Ti)	0 – 1000	0 – 1000	0 – 1000				
Vanadium (V)	0 – 1000	0 – 1000	0 – 1000	0 – 1000	0 – 100		
Tungsten (W)		0 – 100					
Zinc (Zn)	0 – 1000	0 – 1000	0 – 6000	0 – 1000	0 – 100	0 – 50	0 – 10
Zirconium (Zr)		0 – 100					
TOTAL	**26**	**32**	**26**	**15**	**15**	**13**	**19**

All values in this table represent detection ranges in ppm.

Technical Specifications of eraoil

Available Test Methods	ASTM D6595: Wear metals, contaminants and additives in used lubricating oils and hydraulic fluids ASTM D6728: Contaminants in gas turbine and engine fuel
Correlation to	ASTM D5185 (ICP-AES)
Spectrometer Type	Rotating Disc Electrode Spectrometer (190 - 810 nm) Thermally stabilized Paschen-Runge mounting with CMOS detectors
Measurands	Elemental concentrations in ppm (mg/kg)
Applications	Determination of additives, wear metals and contaminants in lubricating oils, hydraulic fluids, gas turbine & diesel engine fuel, heavy fuel oil (HFO), crude oil, glycol coolants, process water, mineral water, and grease
Analytical Range	Simultaneous measurement of up to 32 elements in 30 seconds with sub-ppm detection limit (LOD) for most elements incl. automatic background correction
Calibration	Factory calibrated for 26 elements Optional calibration for up to 32 elements
Sample Volume	2 mL; no solvents, reagents or gases are needed, no cleaning of cell window
Operating Conditions	0 °C to 40 °C (32 °F to 104 °F) Up to 90% humidity, non-condensing
Design Features	Built-in electrode sharpener and ventilation system Interfaces: Industry-proven multilingual 10” color touchscreen Built-in PC with Ethernet, USB, and RS232 interfaces Optional connection of a monitor and data input by external keyboard, mouse, or barcode reader
PC-Software	ERASOFT OCM Software – Supports the operator in the management, operation and maintenance of technical OCM facilities
Software	Windows® software for convenient data transfer, viewing spectra and result analysis
Result Database	Over 100,000 detailed test reports and spectra storable in internal memory
Dimensions	W x D x H = 37.0 x 69.6 x 69.4 cm (14.6 x 27.4 x 27.3 in)
Weight	85 kg (187 lb)
Power Requirements	90 – 270 V, AC 50/60 Hz, 500 W
Recommended Consumables for 1000 Tests	EOL01 – A001 graphite discs (1000 pcs) EOL01 – A002 graphite electrodes (100 pcs) EOL01 – A003 2 mL sample cups (1000 pcs)

Due to continuing product development, specifications are subject to change.
All **era**lytics products are manufactured under ISO 9001 regulations and are CE, ROHS and UL/CSA compliant. **www.eralytics.com/eraoil**

eralytics instruments are available worldwide.
An international network of over 50 authorized and well-trained distributors is ready to answer your inquiries and to offer local support and service.
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