SPECTRO GENESIS ICP-OES
CONDITION MONITORING SYSTEM

Performance, price, and productivity for lubricating oil analysis

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• D5188-09 • D7891-11

EN • 14538:2006
• 16294:2012
SPECTRO GENESIS
The high-productivity, right-priced ICP-OES condition monitoring system

The SPECTRO GENESIS inductively coupled plasma optical emission spectrometer (ICP-OES) is setting a new standard in the analysis of wear metals in oils for condition monitoring. This high-performance analyzer swiftly, accurately, and cost-effectively assesses component wear trends, detecting additive and wear elements and contaminants that may accelerate wear. It allows lubricating oil users to prevent equipment failure and optimize their maintenance programs. Unlike previous ICP analyzers, the innovative SPECTRO GENESIS is easy to use, possesses industrial-grade durability, and is surprisingly affordable to purchase and operate.

SPECTRO GENESIS ADVANTAGES

- Its full-spectrum capability covers the entire range needed for additive, wear, and trace element analysis of lubricating oils — including high sensitivity for light elements (Na, Mg, Al, and Si)

- With fully simultaneous analysis, it can achieve sample cycle times of 90 seconds, independent of the number of elements to be determined

- Available with a full complement of factory methods, compliant to ASTM and EN methods and standards. Including standard operating procedures, they are set up for instant use

- Available as a complete condition monitoring package, containing factory methods, an autosampler, the sample introduction system, and dedicated application specific standard operating procedures

- It features an ultra-low purge gas rate for the optical system — delivering minimum consumable gas costs, and saving thousands over the life of the instrument

- Unlike FAAS instruments and many other ICP analyzers, it performs a complete spectrum capture with every measurement, for later evaluation if needed

- It provides both condition monitoring laboratories and oil blenders with all the uptime, productivity, stability, and reliability they require
The high price of conventional ICP-OES spectrometers has meant that many laboratories still depend on flame atomic absorption spectroscopy (FAAS) for used oil analysis. However, labs are increasingly finding that FAAS systems can’t keep up with their growing productivity needs. For most condition monitoring labs running more than 50 samples per day with 10 or more elements, the SPECTRO GENESIS petrochemical package represents the ideal solution.

**COMPACT AND LIGHTWEIGHT**
With a sturdy but lightweight (150 kg/330 lb) aluminum construction, SPECTRO GENESIS fits into tight laboratory spaces. It can usually be installed on the same standard benchtop as an FAAS analyzer.

**ACCU R A C E A N D E A S Y**
The analyzer’s side-on interface for radial plasma observation is optimum for condition monitoring applications. It’s robust, ideal for high and varying sample loads, and superior to axial designs for handling organic matrices. Results: added linear range and precision, plus outstanding stability and ease of maintenance.

**POWERFUL AND STABLE**
The SPECTRO GENESIS generator includes top-of-the-line components such as a solid-state 4.5 kV power supply and a free-running 27 MHz oscillator. It has the power and stability needed for the high plasma load that organics demand. And exclusive air cooling eliminates complicated, costly, water-based external cooling systems.

**COMPREHENSIVE, FAST, AND AFFORDABLE**
Its advanced optical system features innovative technologies with continuous wavelength coverage from 175 nm to 520 nm, plus added detectors for sodium, potassium, and lithium. Unlike FAAS or most other ICP spectrometers, SPECTRO GENESIS offers full simultaneous analysis — with rapid sample cycle times of 90 seconds or less. It delivers excellent UV performance, and avoids expensive gas consumption to provide the lowest operating costs in its class.

**EXAMPLE:** Examining only 16 elements, a typical FAAS instrument can sequentially analyze up to 180 samples in an 8-hour shift. In the same time, the affordable SPECTRO GENESIS can analyze up to 320 samples — independent of the number of elements to be analyzed. Plus it enables safe automatic operation, uses no flammable gases, while analyzing elements such as silicon, aluminum, and phosphorous where FAAS analysis falls short.
OUTSTANDING ANALYTICAL PERFORMANCE

Used oil analysis is quite challenging for traditional spectrometers. SPECTRO GENESIS performs with ease. Robust and stable, it can easily handle organic matrices with superior performance.

Recoveries of NIST SRM 1084a diluted in Kerosene (1:10)

<table>
<thead>
<tr>
<th>Element</th>
<th>Certified Conc. [mg/kg]</th>
<th>Measured Conc. [mg/kg]</th>
<th>Recovery [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>(104)</td>
<td>102</td>
<td>98.1</td>
</tr>
<tr>
<td>Ag</td>
<td>101.4 ± 1.5</td>
<td>100.5</td>
<td>99.1</td>
</tr>
<tr>
<td>Cr</td>
<td>98.3 ± 0.8</td>
<td>101.1</td>
<td>102.8</td>
</tr>
<tr>
<td>Cu</td>
<td>100 ± 1.9</td>
<td>103.8</td>
<td>103.8</td>
</tr>
<tr>
<td>Fe</td>
<td>98.9 ± 1.4</td>
<td>106.5</td>
<td>107.7</td>
</tr>
<tr>
<td>Mg</td>
<td>99.5 ± 1.7</td>
<td>97.7</td>
<td>98.1</td>
</tr>
<tr>
<td>Mo</td>
<td>100.3 ± 1.4</td>
<td>103.3</td>
<td>103</td>
</tr>
<tr>
<td>Ni</td>
<td>99.7 ± 1.6</td>
<td>105.7</td>
<td>106</td>
</tr>
<tr>
<td>Pb</td>
<td>101.1 ± 1.3</td>
<td>103</td>
<td>101.9</td>
</tr>
<tr>
<td>Sn</td>
<td>97.2 ± 2.6</td>
<td>100.7</td>
<td>103.6</td>
</tr>
<tr>
<td>Ti</td>
<td>100.4 ± 3.8</td>
<td>104.3</td>
<td>103.9</td>
</tr>
<tr>
<td>V</td>
<td>95.9 ± 9.4</td>
<td>102.4</td>
<td>106.8</td>
</tr>
<tr>
<td>S</td>
<td>(1700)</td>
<td>1570</td>
<td>92.4</td>
</tr>
<tr>
<td>Si</td>
<td>(103)</td>
<td>106.9</td>
<td>103.8</td>
</tr>
</tbody>
</table>

values in brackets are indicative

AMECARE PERFORMANCE SERVICES

Downtime is the enemy of critical sample turnaround speed. Condition monitoring laboratories can’t afford to keep customers waiting. SPECTRO helps ensure uninterrupted performance as well as maximum ROI over a spectrometer’s life with our AMECARE programs — including proactive performance maintenance, performance upgrades, applications solutions, consultation, targeted training, and ongoing support.

www.spectro.com

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