Putting Lubricant & Fuel Analysis Back Where It Belongs - in your hands

INTRODUCING
the SEA-Mate® Analyzer

MAERSK FLUID TECHNOLOGY
The SEA-Mate® line of advanced XRF Analyzers from Maersk Fluid Technology provide the maritime, oil and gas and power generation industries with a field proven state of the art on-board or on-site lubricants and fuels analysis capability.

The SEA-Mate® Analyzer provides a reliable and cost effective maintenance management tool that is specifically designed to reduce the users net cost of operation and Total Cost of Ownership, with returns of investment measured in months and not years.
Receiving fuel of poor quality can be a nightmare for ship operators because off-spec fuel wears out the engine and can even cause severe damage to critical components. The need for continuous monitoring of an engine’s performance is not to be taken lightly. SEA-Mate® now puts this critical diagnostic process under your control, and not in the hands of a third party.

There are two SEA-Mate® Analyzer models. The SEA-Mate® M2000 is designed for analyzing lubricants and fuel sulfur only and the SEA-Mate® M3000 which analyzes both lubricants and fuels, and includes the detection and measurement of cat fines in the fuel.

Elements Measured:

<table>
<thead>
<tr>
<th>Fuel Sulfur</th>
<th>Al + Si</th>
<th>Fe</th>
<th>Pb</th>
<th>Cu</th>
<th>V</th>
<th>Ni</th>
<th>Cr</th>
<th>Zn</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M2000</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>M3000</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Detection range/ PPM</td>
<td>100-60 K</td>
<td>&lt;5</td>
<td>0-5 K</td>
<td>1000</td>
<td>0-1000</td>
<td>0-1000</td>
<td>0-1000</td>
<td>5000</td>
<td>50000</td>
</tr>
</tbody>
</table>

SEA-Mate® Product Specifications:

<table>
<thead>
<tr>
<th>M2000</th>
<th>M3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>27 kg</td>
</tr>
<tr>
<td>Excitation Source</td>
<td>X-ray tube, Mo anode, 6kV up to 50 kV with a max of 50W</td>
</tr>
<tr>
<td>Detector</td>
<td>Si PIN diode detector, &lt; 220 eV FWHM at 5.95 keV Mn K-alpha line</td>
</tr>
<tr>
<td>Temperature R</td>
<td>+5°C - +40°C</td>
</tr>
<tr>
<td>Operation</td>
<td>Windows based PC</td>
</tr>
</tbody>
</table>
Maersk Fluid Technology has carried out extensive field tests on several vessels and power plants. As the graphs reveal, there is excellent correlation between SEA-Mate® Analyzer results and those from the same sample run at a land based lab.

Scrape-down oil from MAN B+W 12K90MC - Iron analysis, High Wear Regime

Scrape-down oil from MAN B+W 12K90MC - Nickel Analysis, High Wear Regime

Heavy Fuel Oil in service on MAN B+W 12K90MC - Sulphur Analysis

Heavy Fuel Oil in service on MAN B+W 12K90MC - Vanadium Analysis
SEA-MATE® ANALYZERS
DETECTION OF CAT FINES

As the maritime industry moves more and more into the use of lower sulfur fuels, there is a higher risk of significant ring and liner damage from abrasive cat fines from the low sulfur fuel manufacturing process. As depicted in the photograph below, these hard particles become embedded in the matrix of the ring and liner material and cause significant damage. Many cases have been reported that multiple liners have been destroyed in a matter of days following the introduction of cat fines from the fuel. SEA-Mate® M3000 analyzers allow the shipowner to confirm the presence and magnitude of cat fines in the fuel within minutes allowing the operator to refuse a load of fuel that could be potentially damaging to the engine.

“Why pay a third party and wait for the results when you can generate the same results on-board or on-site in just minutes?”

The Value Calculator online at www.maerskfluid.com allows you to calculate the degree of savings your fleet will realize through using the SEA-Mate® Analyzer as an integral part of your maintenance program.

The example above is based on existing customers and shows the typical payback period.
Accurate results in 6 minutes rather than two weeks - which do you prefer?

The accuracy and speed of SEA-Mate® Analyzers are only a few of the benefits that owning a unit provides the end user. The table to the right gives an overview of just some of the tangible benefits that a SEA-Mate® Analyzer can bring to your operation.

The SEA-Mate® Analyzer has the capability to identify problems before they become costly and potentially dangerous events. One or two early detections and related cost-avoidance will more than exceed the price of the SEA-Mate® Analyzer.

Besides the outstanding – and field-proven – capabilities of the SEA-Mate® Analyzer, we are pleased to offer our customers the following purchasing terms and support services:

- Professional installation and training of personnel on-board or on-site
- Automatic notification of all SEA-Mate® Analyzer software and hardware upgrades offered at existing customer discounts
- A 1 year full warranty on all parts and labor
- The option to customize the SEA-Mate® Analyzer unit and software with your company’s color and logo
- Regional MFT-I contacts to discuss any questions or concerns that may arise after installation

To find out more about the SEA-Mate® Analyzer product line, visit our web site at www.maerskfluid.com.

We look forward to hearing from you!
SEA-Mate® offered in collaboration with Innov-X, the bench mark in XRF technology