

Oils / Fuels / Fluids

Total Analysis Solutions



Focus

- Heavy Transportation
- Power Generation
- Aerospace
- Handheld XRF
- Mobile XRF
- Custom XRF

Rapid Results... Anywhere, Anytime

Elemental Analysis for Oils, Additives,
Fuels, Liquids

Innov-X Systems provides a complete line of solutions for on-site oils and fluids testing. Based on proven X-ray Fluorescence (XRF) technology, each Innov-X system provides fast, accurate data that can help meet regulatory compliance for fuels and oils, and can direct cost-effective engine operation in heavy transportation and machinery, power generators, and aerospace equipment. You pick the time and place—we'll provide a real-time analysis solution.

The X-50: High Powered Mobile XRF

Don't wait for lab results, get "anywhere analysis" with Innov-X mobile and custom XRF solutions.

- ▶ Laboratory benchtop analytical power in a portable, field-hardened package
- ▶ Analyze wear metals, additive elements (V, Zn, Ca, Ba, others)
- ▶ Fuel, additive analysis for quality and contaminants
- ▶ Unique fluid sampling chamber prevents spillage
- ▶ User friendly—ideal for non-technical operators
- ▶ Powerful software includes full-featured analytical and user calibration package
- ▶ Operate on battery or AC power

X-50
Mobile XRF Analyzer



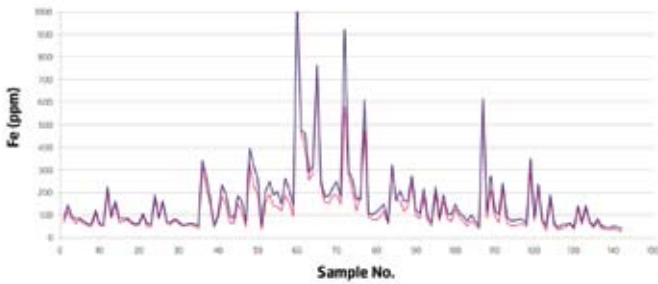
LAMBDA
*PPM-Level, In-Field
Elemental Analysis*

The LAMBDA: PPM-Level, In-Field Elemental Analysis

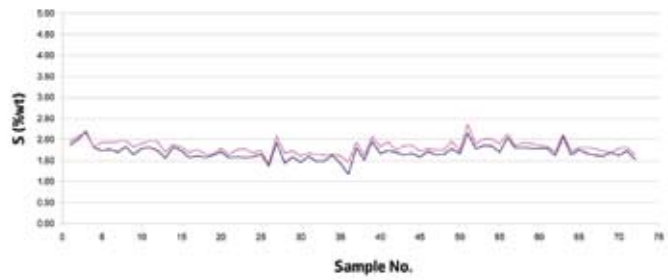
- ▶ Ultra high performance for low atomic number elements in fuels, oils, additives, other liquids
- ▶ Measure Ca, S, Mg, Al, P, Si, Cl to ppm levels in hydrocarbon and aqueous solutions
- ▶ Ultra-low limits of detection for Al, Si (catfines)
- ▶ Elemental analysis of additives & polymers—Mg, Ca, Ba, Si, V, Mo, Zn, & more
- ▶ Test catalysts & process streams for poisons—Ni, V, As, & more
- ▶ General fluids analysis for ppm level transition metals

PRODUCT DATA

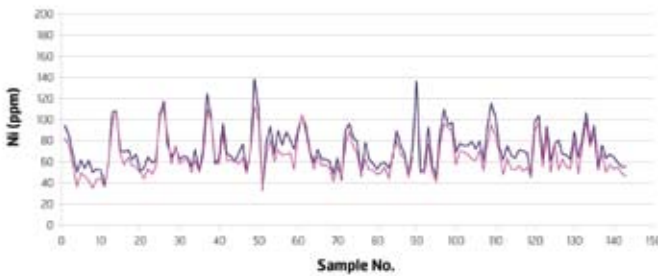
Scrape-down oil from MAN B+W 12K90MC – Iron analysis, High Wear Regime



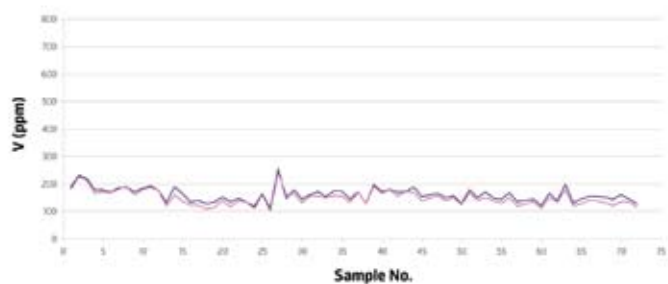
Heavy Fuel Oil in service on MAN B+W 12K90MC - Sulphur Analysis



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



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



— SEA-Mate®
— DNV Norway ICP results

— SEA-Mate®
— DNV Norway ICP results

Comparison of vessel XRF results versus laboratory analysis for main cylinder oil in several marine vessels. XRF results show the ability to trend wear metals, additive contamination and sulfur content in lubes and fuels.

| Element | X-50 Detection Limit (ppm) | LAMBDA Detection Limit (ppm) |
|---------------------------------|----------------------------|------------------------------|
| Wear Metals | | |
| Titanium | 10 | 10 |
| Chromium | 3 | 3 |
| Iron | 1 | 1 |
| Nickel | 1 | 1 |
| Copper | 1 | 1 |
| Lead | 1 | 1 |
| Fuel, Additives Analysis | | |
| Calcium | 30 | 2 |
| Vanadium | 5 | 3 |
| Zinc | 10 | 1 |
| Barium | 10 | 10 |
| Phosphorus | 1,000 (0.1%) | 3 |
| Magnesium | NA | 5 |
| Chlorine | 200 | 5 |
| Silicon | NA | 3 |
| Other Applications | | |
| Mg in aqueous solution | NA | 5 |
| P in aqueous solution | 1,000 (0.1%) | 3 |

Comparison table of detection limits for X-50 and LAMBDA products. Limits shown are for a sampling of elements, XRF typically analyzes up to 25 elements simultaneously. Values shown above are estimated for interference-free samples, with 2–3 minute test times (application specific).



Foremost Supplier to Marine Transportation Industry

The marine shipping industry depends on the SEA-Mate® oil analyzer—manufactured by Innov-X and joint venture partner A.P. Moller-Maersk—for on-board measurements of oil, fuel and additive quality. On-the-spot decisions as to lube and fuel quality, at sea, for ocean going container vessel fleets is yet another example of the confidence placed in our XRF analyzers. Operators perform analysis of wear metals, additives, sulfur content and catfines (Al, Si) while at sea and while bunkering worldwide.

