



Oil Analyser

Optimising financial and environmental management of ships

L-O-A-S Oil Analyser

NanoNord A/S is a technology company based in Aalborg in northern Denmark. NanoNord's mission is applying modern technology to optimise the economic and environmental operation of shipping. The company's present focus is the monitoring and management of fuel oil, lubricants and exhaust emissions. NanoNord's majority shareholder is the J Lauritzen group.

Lab-On-A-Ship™ is an automated system for analysing fuel oil and lubricants in-line on board ship. Samples are extracted from different points on board and transported to the system over a dedicated pipe network. Typical sampling points include the bunkering line, purifiers, and engine inlets.

VALUE PROPOSITION

1. Detect excessive catfines in fuel oil on delivery, at purifier and at main engine inlet significantly mitigating the risk of rapid wear and ultimately engine failure
2. Monitor purifier efficiency by measuring oil characteristics before and after purifier.
3. Control and demonstrate regulatory compliance with regard to SOx emissions
4. Monitor fuel quality and consumption compared with engine output facilitating long-term optimization of propulsion performance.
5. Monitor fuel quality and density at point of delivery enabling better purchasing management and avoid costly de-bunkering.

Lab-On-A-Ship's™ Data Collector module is designed to assemble related information from other existing sensors and information systems on board, for example, fuel flow meters, GPS, anemometer, Ship's Data recorder etc. Data is transmitted via satellite to a shore based server. Customized reports are automatically prepared and emailed to ship management.

Lab-On-A-Ship™ is jointly marketed with Lloyds Register FOBAS. A 24/7 technical support from Lloyds Register is offered with the product.



Effective purchasing management

Lab-On-A-Ship™ enables real-time analysis of fuel during bunkering. The loading of potentially damaging fuel, for example with high catfines, can be stopped avoiding slow expensive de-bunkering. Poor quality but acceptable fuel can be identified and special processing at the purifiers planned. Furthermore, the Chief Engineer and Purchasing Manager, with the assistance of an immediate quality report on completion of bunkering can lodge a note of protest and claim. The instant quality report on completion also enables the immediate use of the fuel rather than awaiting a laboratory report some days later.

Purifier Efficiency

Heavy Fuel Oil confirmed to ISO 8217 is generally not fit for use without critical pre-treatment, in particular, the cleaning of the fuel at the purifiers. Efficiency of purifier operation is a well known problem in shipping. Monitoring fuel quality before and after the purifier gives effective control of purifier efficiency. Furthermore, monitoring fuel quality from the purifier controls the quality of fuel going to the service tank.

Cylinder oil feed rate optimization

Monitoring sulphur content in fuel at the engine inlet enables a more precise determination of required cylinder oil feed rate. This in turn:

- Reduces cylinder oil cost
- Reduces particulate matter in exhaust gas
- Minimizes ash build up on piston crown



Regulatory compliance

The potential for criminalisation of seafarers through non-compliance with increasing environmental regulations is a growing concern. The imminent introduction of the North American Environmental Control Area will further exacerbate this potential. Real time monitoring of sulphur content in fuel and SOx emissions enables the management and verification of compliance.

Fuel consumption optimization

Lab-On-A-Ship™ calculates Net Specific Energy of fuel. When combined with mass flow meters, the energy consumption of the engines can be effectively monitored. The system's Data Collector can also assemble and analyse other relevant data such as torque meter output, anemometer and engine data. This provides an effective tool for optimization of performance.

Condition based maintenance

Lab-On-A-Ship™ can also be used to monitor lubricants. This provides an invaluable monitor of engine wear by measuring wear metal trends. It also monitors lubricant quality. Monitoring water quantities and wear metals regularly, for example in stern tube oil, could enable a significant increase in the inspection interval and the expense of pulling the stern tube.



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SPECIFICATIONS

Supply Voltage	230v AC, 50 / 60 Hz, 13 amp fuse
Fuel Temperature	50oC to 120oC
Max Pressure at Inlet	6 bar
Max Viscosity	700cSt @ 50oC
Max Humidity	95% non-condensing
IP Class	IP23

PARAMETER

Catalytic Fines - Silicon/Aluminium [10-200 mg/Kg]
Chromium
Copper
Density @ 15°C [800-1,200kg/m³]
Iron
Oil Temperature @ 12.5 cSt [°C]
Sodium
Sulphur [0.1-5.0 % m/m]
Tin
Vanadium [10-400 mg/Kg]
Viscosity @ 50°C [10-700 cSt]
Water [0.03-5.0% V/V]

CCAI [Index]
Estimated Ash [% m/m]
Net Specific Energy [MJ/kg]



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