FUEL ANALYSIS PROGRAM

DESCRIPTION

The trend toward use of high-viscosity blended residual fuels, coupled with the general decline in their quality, has created an array of problems for diesel engine and boiler opera-tors. Furthermore, the increased popularity of distillate and low-sulphur fuel oils (LSFO) and resulting blends to meet stricter emission regulations has led to potential compatibility problems during distillate/LSFO changeover. Knowing the chemical and physical characteristics of each bunkering prior to use can minimize many of these problems which may cause costly repairs and disputes between owners, charterer, and bunker suppliers.

Drew Marine provides a comprehensive analysis and evaluation of the chemical and physical properties of each fuel sample analyzed in accordance with ISO 8217 specifications. The results of this analysis, as well as a technical interpretation of those results, are normally reported via facsimile or e-mail within 24 hours of receipt of the fuel sample into the laboratory. With this information, operating and fuel handling procedures can be adjusted for each bunkering to achieve optimum engine performance. In certain cases, the use of fuel additives may be an additional means to increase engine efficiency. Contact your Drew Marine representative for additional information on determining which fuel additives would be most beneficial based on fuel test results.

APPLICATION & USE

Representative fuel oil samples should be drawn from the bunker manifold during the entire bunkering period, using the continuous drip method. Sample bottles and labels and complete sampling and program instructions are included in the Sample Bottle Kit that is available to all participating Continued on page 2vessels. Samples should be sent for analysis using the courier service documentation provided with the kit to expedite a quick return of the analysis report. Fuel samples are analyzed in accordance with ISO 8217 specifications for those properties which provide the information necessary for effective handling and burning of bunkers. For additional details on test methods, or if additional test parameters are required, please contact your Drew Marine representative.

TEST PARAMETERS

Density must be known to calculate the correct amount of fuel received on-board, calculate the CCAI ignition quality and select the correct purifier operating parameters for effective water and contaminant removal.

Viscosity, the basis for setting price, is needed to determine pumping and injection temperatures and calculate the CCAI ignition quality.

Flash Point must be identified for safe storage of the fuel; 600C is the minimum flash point established by SOLAS.

Pour Point is the lowest temperature at which the fuel will flow and is important for pumping and handling.

Total Sediment is an indication of the fuel's tendency to form sludge in storage tanks, resulting in overloading of purifiers and blockage of filters.

FEATURES

- Comprehensive analysis by an independent ISO-certified lab
- Interpretation of analysis with technical/ erational comments and corrective action
- Results normally received within 24 hours of receipt of sample by laboratory
- Statistical reports of fuel analyses

BENEFITS

- Key values allow operators to optimize combustion and fuel handling
- Provides advice on how to adjust fuel handling and fuel treatment procedures
- Alerts operators to potential fuel handling and/or combustion difficulties, which can lead to increased wear or equipment problems, prior to the fuel's use
- Statistical reports can be used to determine trends in fuel quality for specific fuel oil grades and/or geographic areas to optimize fuel purchases

Contact your Drew Marine representative for more information

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Compatibility must be identified before mixing newly bunkered fuel with existing fuel remaining in storage tanks. Incompatible fuel, if mixed, will result in fuel formation.

Water content, if excessive, results in a loss of fuel volume received and a loss of energy content.

Ash content identifies the total amount of incombustibles which may lead to corrosive deposits and engine wear.

CCAI (Calculated Carbon Aromaticity Index) and **CCI** (Calculated Cetane Index) are indicators of the fuel's ignition quality.

Carbon Residue is an indication of the fuel's tendency toward forming carbonaceous deposits, resulting in smoke, particulate emissions and deposits in the exhaust system.

Sulphur content will determine the level of SOx emissions from combustion. High levels of sulphur may lead to low temperature corrosion and depletion of the lube oil TBN. Very low levels of sulphur may result in wear to fuel injectors.

Lubricity reported as wear scar diameter is used to evaluate boundary lubrication properties and the relative effectiveness of distillate fuel oil for preventing wear. Very low levels of sulphur may result in wear to fuel injectors.

Sodium contamination from seawater or salt air can combine with vanadium during combustion, forming "sticky" compounds with low melting points, resulting in the formation of corrosive vanadium slag deposits on exhaust valves and boiler screen and superheater tubes.

Vanadium, when combined with sodium, may lead to high- temperature corrosive deposits. Vanadium compounds also accelerate the formation of corrosive sulphur compounds.

Aluminum and **Silicon** content are the catalytic fines remaining in heavy fuels after the refining process. These particles are extremely abrasive and cause wear to pumps, injectors and cylinder liners.

Hydrogen Sulfide is a highly toxic gas. Exposure to high vapor concentrations is hazardous and in extreme cases lead to death.

Acid Number levels significantly higher than the specification can indicate significant amounts of acidiccompounds and, possibly, other contaminants and occasionally cause accelerated damage to marinediesel fuel injection equipment.

Oxidation Stability levels higher than the specification are indicative of the inclusion of bio-derived products (e.g., FAMEs) which have implications associated with long-term storage issues, increased affinity to water and risk of microbial growth, degraded low-temperature flow properties, etc.

Cloud Point is the temperature at which wax crystals begin to form and can result in filter clogging and in extreme cases engine starvation.

Appearance is assessed by visual inspection in good light, free from glare and shadow which provides an indication of a distillate fuel's cleanliness from water, dirt, or other visual contaminants.

Calorific Value provides a calculated value of the amount of chemical energy which may be converted into mechanical energy.

Used Lube Oil contamination of fuel is determined by testing for calcium, phosphorus and zinc, which are common additives found in lubricating oils.

Analysis for additional fuel properties and contaminants is available upon request. Consult your Drew Marine representative for price and availability.

ORDERING INFORMATION

	PCN
Sample Bottle Kit	1AA9829
CUBITAINER1 Kit (5 liter), 12 pieces	1AA9830
CUBITAINER Kit (10 liter), 12 pieces	1AA9831

OTHER FUEL MANAGEMENT PRODUCTS AND SERVICES

- DRIP-TEC™ fuel oil sample
- Fuel Oil Sample Retention Cabinet
- Onboard Fuel and Lube Oil Test Kits
- Chemical Fuel Additives

Contact your Drew Marine representative for more information

Drew Marine maintains Safety Data Sheets on all of its products. These documents contain health and safety information for the development of appropriate product handling procedures to protect your employees. Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Drew Marine products.

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