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Oil monitoring onboard a ship

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Fig 1.0 EESIFLO's water sensor installed On a ship purifier system

Changing the oil in an engine regularly protect and pays off in the long run. But it also involve out a lot of serviceable oil from ships that see strenuous use, and a schedule can't predict w break down ahead of time.

That's why a number of efforts are aimed at d board systems to measure oil quality in real ti least, to base predictions on specific, observa conditions.

A reliable means of monitoring the condition o will permit a new kind of just-in-time maintena according to some forecasters, could save mil quarts of oil a year.

Although ships schedule oil changes along conservative time frames, this does not solve the problems of premature lubrication failure. Industry-wide minimum standards exist for acceptable engine oil quality, engine oil performance can vary widely according to individual conditions including usage times , filtrations systems and engine design.

The bottom line when scheduling oil changes is to achieve the full design service life of the engine.

Fig 1.2 Saving oil a global campa

This means it is important to analyze the oil condition for water content and particles.Many factors aff performance in different ways. One of them could be the temperature differentials observed. Commor us that an oil can hold more dissolved water at higher temperatures. Once the temperature drops , it i get free water formation and eventually contamination which can create problems such as lower perfc lower life expectancy of an engine and corrosion.

Fig 1.3 The worst that could happen when engines fail

All ship maintenance personnel must follow a recommend schedulec along very conservative timeframes and usage has to be taken into a although in some parts of the world this has been neglected somewh

An effective schedule has to call for maintenance before signs of enc occur. "If you see signs of wear occurring, it's too late!

EESIFLO's Water in Oil Sensor – A dual purpose!

Sometimes schedule-based maintenance can have several disadvantages. One disadvantage is that it can be wasteful, requiring oil changes before they actually become necessary .

EESIFLO's EASZ-1 on-board oil monitoring device is now commercially available . The sensor has been designed to measure water content in oil but can also be used to measure aging of oil (or a change in its state)by monitoring the dielectric constant, which correlates to the acidity, an indicator of oil degradation.

The monitor has been designed to accurately measure the water content in oil .

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Newly supplied oil can be used as a reference as a "dry good oil" and the capacitance of that oil can b changes in capacitance can be logged and monitored over time, even compared with spot samples s laboratory to ascertain how the oil has changed and what reference capacitance this might correlate t

The important factor for the EASZ-1 is not only its ability to measure the water content in oil but also i has changed in the oil itself. Since we can establish that both water and aged oil have a direct effect c capacitance it is possible to have an older oil with known amounts of water (from samples taken to th reset to the lab report values.

If logs are kept on capacitance values over time, it will be possible to see trends or changes in capaci may not necessarily be linked to water content increase and hence we will have more of an idea whe aged. What this all means for companies who research and take great interest in monitoring is that th from schedule-based maintenance to condition-based maintenance, which reduces waste that occurs replacement is based on a schedule.

Replacing oil at the correct time has enormous economic savings and is also bettering our environm combination of measurements will present a truer picture of oil degradation than just one measureme

Fig 1.5 Ships should be accountable for water in oil

Measuring oil quality is usually done with a chemical laboratory benchmark procedure measures several parameters indicating oi degradation. These factors include viscosit number, and particle concentration. The se developed by EESIFLO measures the diel constant of oil, which increases as molecu down and the additives in the oil deplete w The dielectric constant correlates well with number and is easier to measure than othe making it suitable as the basis of an on-bo system. The dielectric constant of oil depe length of the service period and the compo molecules. As friction and temperature cau molecules to break down and as additives the dielectric constant increases, measure increased voltage.

The sensor is similar to a variable capacitor that consists of two parallel (co-axis pipes) electrodes se gap filled with oil. It consists of a sensing cell that is in direct contact with oil- an electronic circuit that signal from the sensing element to output current. The sensor weighs just over 1kg and can be conne standard NPT pipe connections.

Temperature Sensitivity

One difficulty in measuring the dielectric constant is its sensitivity to temperature. As temperature rise dielectric constant also rises. To cancel out this temperature dependency, the sensor signal condition with compensation circuitry. The temperature sensing element is mounted as near to the process me

possible.

In addition to measuring oil degradation by monitoring molecular breakdown, the sensor also can be u the presence of contaminants such as, each of which has a different dielectric,water has a much high constant than oil, so relatively small amounts can be detected.

The sensor can be installed on some large diesel engines. A great is to detect seawater contaminatio engines. Other places where the system could be useful would be hydraulic systems and compresso seal lubricant monitoring and any larger hydraulic system where water contamination is a threat.

Current specifications for standard EESIFLO EASZ-1 water in oil sensors: Contact EESIFLO Internati information at http://www.eesiflo.com

EESIFLO MODEL EASZ-1 STANDARD SPECIFICATIONS

GENERAL

Water in Oil range	0-10000ppm, 0-1%,0-3%,0-10% and 0-25%
Recommended Flow Range	5 to 150 LPM
Resolution	0.001% water
Temperature compensation	Built in Temperature compensation
Temperature range	0-150 °C or 300 °F
Shipping Weight	Approximately 1kg/3lbs

MECHANICAL

Cell Construction Material	316L
Pipe Connection	1 inch NPT thread (other threads/sizes ava
Maximum Temperature	150 °C/300 °F
Pressure Rating	16 Bar /230 psi

ELECTRICAL

Power Requirements	Loop Power or 24 vdc (grounded or ungrou
Electronic Protection	Encapsulation
Operating Temperature	-40 °F -185 °F (-40 °C to 85 °C)
Enclosure	Anodized Aluminium Epoxy Coated
Outputs	4-20 mA DC , RS232 Full Duplex ,Optiona
Options	Remote readout/display