



Date: 24/06/10

Ref: PHHFDE153/draft

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Prevention is better than cure

Parker Hannifin's Hydraulic Filter Division in Europe looks at how the cost of industrial processes can be cut considerably by using the latest filtration and condition monitoring technology

The global credit crisis continues to see pressures being placed on equipment manufacturers, with operating margins in particular becoming increasingly tight. Couple this with the rapidly rising costs of raw materials and energy, and the challenge becomes tougher still. Remaining productive and profitable therefore means that companies must tactically assess all aspects of their operation to ensure that waste, downtime and inefficiencies are reduced to an absolute minimum.

One particular area that can absorb considerable resources is the use of oils and lubricants which, will over time, slowly degrade, losing both their physical and chemical properties. This is generally due to sustained use at extreme temperatures – high or low – or to factors such as under or over-lubrication of moving parts.

Although degradation is likely to be a gradual process, it will occur at a far faster rate if lubricants become contaminated with dust and debris, moisture or the incorrect use of solvents or other oil mixtures. As a result, contamination will increase operating costs and impact negatively on productivity. For example, the loss of lubricating properties will increase wear, heat and noise in high speed shafts and bearings, leading to increased power

consumption and early failure of components; this is especially true in modern equipment where tolerances are becoming smaller and smaller. Similarly, once oil has become contaminated it has to be replaced and then disposed of using approved contractors, both of which can considerably add to costs.

Although it is impossible for lubricants to last forever, the use of simple condition monitoring equipment, combined with a practical approach to filter replacement, can significantly extend their operating life, enabling companies to take a proactive approach to preventative maintenance.

Traditionally, samples of hydraulic oils and lubricating fluids needed to be analysed in a laboratory before contamination levels could be accurately measured, requiring time, money and resources; now this can be done quickly, easily and accurately at the point of use. For example, handheld analysis devices can detect and measure the dielectric constant of a small sample of oil, highlighting changes in oil condition brought about by the ingress of water, particle contamination, metallic content or oxidation.

On Parker's Oilcheck unit, for instance, readings are displayed both as a numeric value and on a simple-to-read, circular red/green efficiency scale. Used together, these displays allow a gradual change in oil quality to be recorded and, in samples where contamination has reached a critical level, for a problem to be identified immediately.

Similarly, the latest generation of compact online detectors, such as Parker's icountPD particle detector, use laser technology to identify particulate contamination and the presence of moisture. The hydraulic oil or lubricating fluid being tested is passed through the laser and the shadow of any particle suspended in the fluid is measured by way of a voltage drop

across a light sensitive diode. The signal generated as a result of the shadow is dependant on the size of the particle and the speed at which it passes through the light. Once installed, these devices continuously monitor the cleanliness of hydraulic oil, providing warnings of low, medium or high contamination levels through simple onboard LED indicators or via links to remote control systems.

For example, the accurate and compact icountPD provides an 'Early Warning' lubrication and hydraulic oil monitoring system, whether online or offline. Also available is Parker's icount Lubrication and Hydraulic Oil Monitoring System that features Parker's laser technology and all the necessary components for reliable monitoring up to 1000 cSt oil viscosities. Particles can be detected from any available source and a viscosity measurement can be specified. Also available as an option is a moisture sensor that enables the measurement of the oil's relative humidity.

The icountPD enables efficient data transmission and management making it ideal for use in remote applications, such as large wind farms both on and off shore. The innovative unit is offered in several power versions for easy installation and worldwide operation, while a special design for wind turbine applications with a pressurised connection is available.

In addition to detecting particulate contamination, particle detectors can also reveal moisture in lubrication systems, providing operators with a percentage volume distribution of the contamination present. Furthermore, the latest instruments feature a memory function capable of holding hundreds of test results, which can be read from the handset, printed as hard copies, or downloaded to a PC for simple analysis and distribution.

Implementing this latest generation of condition monitoring technology can enable engineers to optimise the performance, efficiency and service life of machinery, by providing them with an early warning that the condition of other system components is changing. However, it should be recognised that, to be truly effective, condition monitoring technology needs to be used in conjunction with efficient hydraulic filtration systems. This furnishes operators with the ability to prevent problems occurring in the first place, by ensuring that contaminants are removed before they can cause damage.

The latest filter technology is far removed from the traditional image of disposable paper elements, being designed to remove extremely low levels of particulate and moisture contamination down to sub-micron level, while maintaining high flow rates with a long operating life, so are capable of delivering levels of performance compatible with the highly accurate detection capabilities of modern online monitoring devices.

The economic downturn of the last two years has meant that manufacturing and industry needs to adopt a positive approach to optimising operating efficiencies and although monitoring of oil condition and the early identification of contamination may not be the most glamorous of subjects, it is nevertheless a crucial procedure that enables manufacturers to reduce costs, boost productivity and improve profitability.

Note to Editors:

With annual sales exceeding \$10 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 52,000 people in 48 countries around the world. Parker has increased its annual dividends paid to shareholders for 53 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's web site at <http://www.parker.com>, or its investor information site at <http://www.phstock.com>.

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