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Press Release

Nitration tests help keep oil and lubricants in good health

Techenomics ensures your engines and equipment are in optimal condition

Just as a blood test indicates many human health issues, Techenomics specialised oil sampling and analysis methods diagnose health issues for engines and mechanical equipment, including those posed by nitration.

There are a range of tests carried out by the company's expert staff on samples using the latest equipment in accredited laboratories and these determine the condition of oil and lubricants.

The amount and type of wear metals, additives, contamination in new and used lubricating oil is identified by spectroscopy and other tests include particle counting, viscosity and oxidation.

The company's CEO Chris Adsett says tests can also indicate nitration in oil. "This is usually the chemical degradation of oil caused by the action of nitrogen oxides and by-products and these generally enter the oil due to 'blow by' past the compression rings.

"Nitration indicates excessive 'blow-by' from cylinder walls and compression rings. It might also be due to the presence of nitric acid, which accelerates oxidation.

"Inconsistencies between oxidation and nitration denote air to fuel ratio problems. As nitration increases, total acid number and viscosity increases simultaneously, while total base number decreases," he says.

Other tests carried out by Techenomics during oil analysis include Total Acid Number (TAN), Total Base Number (TBN) and Particle Quantifier (PQ) Index, as explained by the company's Technology and Product Development manager Eka Karmila.

TAN tests are carried out to determine the amount of acid present to make the lubricant chemically neutral and are often used to determine the serviceability of the lubricant. Elevated values indicate oxidation and contamination.

The TBN measures a lubricant's alkaline reserve, or the ability to neutralise acid. New engine oil should relatively have higher TBN values and this depletes over time.

Eka Karmila says, "As the lube oil base number gets lower, it is time to change the oil."

The PQ Index measures the total ferrous metal content in oil. The Particle Quantifier exposes a lubricant to a magnetic field and the presence of ferrous metals creates a distortion in the magnetic field.

"If the PQ index is small, the ferrous metal content is less and vice versa," Eka Karmila says. "The method is mostly useful for testing differential, transmission and gearbox oils."



Chris Adsett, CEO of
Techenomics International



Technology & Product
Development Manager
Eka Karmila



To obtain this index, oil samples are subjected to a strong magnetic field which becomes distorted by the ferrous particles passing over it. The limits are set at low levels so that major problems can immediately be detected. The PQ Index picks up all sizes of ferrous particles, not just up to 8 microns.



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Chris Adsett says these and other tests carried out by Techenomics ensure that oil and lubricants are given a comprehensive health check so that maintenance issues can be predicted before they arise and result in time-consuming and costly breakdown, or even failure.

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