



HYDAC

FLUID CARE LABORATORY

Services Manual

LABORATORY SERVICES

MICROSCOPIC CONTAMINATION ANALYSIS



Associated Standard: ISO 4406

Commonly referred to as a "Patch Test"; we use the solid particles within your fluid sample, or separate residue (if taken from a used filter etc.), and analyse these under the microscope. This allows us to identify the type of contamination present and verify any particle count results. If required, these solid particles or residues can be further analysed using an SEM (scanning electron microscope) to determine their exact composition.

PARTICLE DISTRIBUTION MEASUREMENT



Standard: ISO 11500

Associated Standard: ISO 4406

Also known as a "Particle Count"; an optical particle counter is used to determine the size and quantity of particles in your sample of oil. The size, composition and quantity of such particles can have a considerable effect on the wear and tear of the hydraulic components within your systems.

WATER CONTENT ANALYSIS



Standard: ASTM D6304

High water content in oil can be very damaging to hydraulic machinery and can contribute to oil ageing, both of which can be very costly to fix. This analysis uses the Karl Fischer method to provide an absolute water content, in PPM, of the solution being tested. We will even recommend safe operating values, as long as we are provided with the fluid type and application.

CONDUCTIVITY TEST



Standard: ASTM D2624

The conductivity of mineral-based oils has decreased over the years, as oil manufacturers have refined their products to provide greater performance and to adhere to environmental restrictions. Despite these benefits, the decrease in conductivity has left some systems vulnerable to electrostatic discharge. This effect can result in sparking at filter elements and other areas of the system, which not only greatly reduces filtration efficiencies but also contributes to oil ageing. This test calculates the value, in pS/m, of the conductivity of your oil; we can then recommend whether there is a risk of electrostatic discharge occurring.

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ICP (ELEMENTAL) ANALYSIS



ICP stands for Inductively Coupled Plasma, and this analysis allows us to identify the quantity, in ppm, of individual elements within a fluid. This is a helpful way of determining contamination causes, whether it's from wear metals or from another source. It also enables identification of additive levels in the fluid and the subsequent trends, allowing us to observe the rate of depletion and recommend oil changes.

VISCOSITY ANALYSIS



Performed at 40°C and 100°C, it is very important to keep track of the viscosity of your oil as it's generally regarded as the most fundamentally important property of lubricants. Increased viscosities will cause excess heat in the system and accelerate the fluid ageing process. A reduced viscosity may mean your components are not being protected, leading to excess wear. If the viscosity of a fluid is found to have changed, then further investigation into the reasons for this change will be necessary, as the oil may not be performing to its required standard.

MPC (VARNISH) ANALYSIS



MPC stands for membrane patch colorimetry, and this tracks the amount of insoluble particles present in the oil so you can act before harmful varnish and sludge build-up occurs on critical components. This is particularly relevant in mineral-based oils that have been subject to high heat or water ingress, as these factors accelerate the rate of oil ageing and varnish production.

TAN (TOTAL ACID NUMBER) ANALYSIS



A potentiometric titrator is used to find the levels of acidity in your oil sample. Acids found in oil are an indication of oil ageing as a result of oxidation; this can lead to corrosion and damaging deposits in the system. This procedure can be used to determine relative changes to the acid levels in your system. This is particularly relevant in ester-based fluids as the rate of acid production is relative to the rate of oil ageing.

These tests are available individually and quotations can be provided upon request.

The above tests are our most commonly performed, but we are not limited to these. If you have a test in mind then please don't hesitate to contact us.

OIL ANALYSIS PACKAGES

Basic Oil Analysis



Included Tests

- Microscopic Contamination Analysis.
- Particle Distribution Measurement.
- Water Content.
- Conductivity.

Advanced Oil Analysis



Included Tests

- Microscopic Contamination Analysis.
- Particle Distribution Measurement.
- Water Content.
- Conductivity.
- Viscosity at 40°C and 100°C.
- ICP (Elemental) Analysis.

Premium Oil Analysis (MPC)



Included Tests

- Microscopic Contamination Analysis.
- Particle Distribution Measurement.
- Water Content.
- Conductivity.
- Viscosity at 40°C and 100°C.
- ICP (Elemental) Analysis.
- MPC (Varnish) Analysis.

Premium Oil Analysis (TAN)



Included Tests

- Microscopic Contamination Analysis.
- Particle Distribution Measurement.
- Water Content.
- Viscosity at 40°C and 100°C.
- ICP (Elemental) Analysis.
- TAN (Total Acid Number) Analysis.

CUSTOMISED PACKAGES

Our **Oil Analysis Packages** have been produced to accommodate our most popular tests. However, we also supply customer tailored packages which can vary in cost, depending on a) the tests required and b) the quantity of samples agreed.

If you wish to develop your own package, including any of the analyses listed, please feel free to contact us.

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