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How to interpret an oil analysis Report

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How to interpret oil analysis reports is a challenge for most lubrication professionals but they are relying on the oil analysis in there reliability programme to help prevent unplanned downtime. If the report cannot be understood, how can the proper corrective action be carried out.

The analysis will be broken down into:

- Wear metals, knowing your equipment and the internal make up will help identify where the wear metals are coming from.
- Contaminants can cause a lot of system failures, coming from sand, dirt, moisture ingress etc.
- Additives are checked and if there is any significant difference in the additives and the base oil, the incorrect oil could have been used, or a possible change of formulation has occurred. It is always best practice to test your virgin oils so you can compare results to baseline levels.

This tests are all carried out using Atomic Emission Spectroscopy (AES) which will detect particle sizes up to 10µm in size.

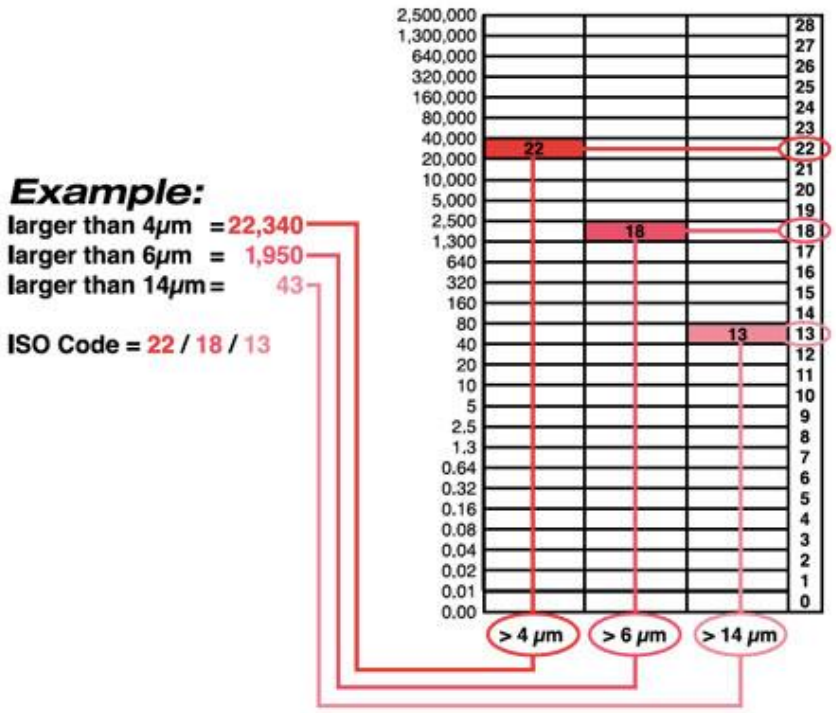
Viscosity is one of the most important properties and an excellent indicator of oil health. The quantitive result is meaningless unless the correct viscosity grade and the temp. at which the oil viscosity is measured at is known. This is normally tested at 40°C for industrial oils, and 40°C and 100°C in engine oils. The quantitive result can then be compared to the base oil level.

The chemical properties are very important in oil, looking at the increase in the Total Acid Number, which can occur from anti-oxidant depletion and oxidation of the oil. These form acids which will increase during the life of the oil. Total base number TBN is tested in engine oils, because of the combustion by products caused by combustion these turn into acid and need to be neutralised by the oil. The rule of thumb is TAN will increase over the life of the oil and TBN will decrease.

If moisture is present in oil it can be a serious threat to your equipment, this can promote rust and oxidation. Moisture can come from external contamination breathers, seals and can also come from internal leaks from water jackets and condensation.

Wear limits should be used on all assets, these are best set by trending of the oil analysis. Regular oil sampling should be carried to build a history for the asset. Trending is very important as this will show how the asset is wearing, knowing the different conditions the assets are working too, may lead to having different limits for the same component types. Limits should be set for individual assets.

Oil cleanliness, solid particles account for the majority of failures in an oil system. The oil cleanliness test is carried on oils and checks for particles, the result is shown as an ISO code 4406. This test measures particles from >4, >6 and >14µm. The code is taken from ISO classification table. The LNF particle counter will also give a wear classification for the particles found, sliding, cutting, fatigue, non-metallic and fibres with some images particles found in the sample which are greater than 20 µm in size.



ISO Classification table of parts/ml

Knowing your equipment, the condition they are working in, has the load increased/decreased is it the same as the previous time it was sampled, these are all very important when reading the report so you can carry out the appropriate corrective action if required.