

## Interpreting an Oil Analysis Report The Top 10 Tips

The final laboratory report is the axle upon which any oil analysis program turns. Without a solid grasp of the underlying principles of reading and understanding the analysis report, the inexperienced reader is likely to grow frustrated with trying to make sense of the test data. However, with a few basic rules, anyone can read and understand an oil analysis report.

**Tip #1 - Know the Sampling Point Before Reviewing its Report** - Familiarity with the machines you monitor - operational, mechanical, maintenance and servicing - is essential for relating information to the oil analysis results.

**Tip #2 - Provide Feedback to the Lab/Sales Rep Regarding Your Findings** - Lab analysts specialize in the chemical and physical oil analysis tests and how they relate to diagnosing mechanical and lubricant-related problems in the system. You have the field experience on the system's operation and application. You know the actual result of any actions you took and damage you discovered based on the data from a given report. Without the analyst's input, you may never learn in depth how problems on the horizon create changes in certain results, and without your input, the analyst and sales rep may never learn the operational details that are sometimes necessary for a set of results to make sense.

**Tip #3 - Learn About Magnitudes of Change for Common Test Results** - When looking at a change in wear metal concentrations from sample to sample, it is important to consider (1) the total area of oil-wetted surface in the system that is made of the metal whose level changed, and (2) the total volume of oil in which the wear metal is suspended. Is wear is being generated from the entire oil-wetted area of the part(s) composed of a given metal, or just a small portion of it?

**Tip #4 - Locate the Worst Reports and Address Them First** - Use the severity/condition status statement or code in the lab's capsule summary to determine the overall seriousness of the conditions revealed by the analysis. Handle those reports indicating abnormal results first in case immediate action is required, then review the less critical reports.

**Tip #5 - Proof the Report's Clerical Data Before Examining the Numerical Data -**

Verify the customer-provided information. Missing data may limit the lab's ability to select and apply appropriate guidelines. Review the following:

1. System support information (machine and lubricant information)
2. Date information (difference between date sample was taken and date lab received it)
3. Operating data records (usage, servicing or machine, i.e. overhaul, oil change, etc)
4. Lubricant in service data (oil manufacturer, brand and grade)

**Tip #6 - Read and Interpret the Report in a Logical Order -** Review the analyst's comments first since they will inform you of any significant changes in machine condition indicated by values or trends in the data. Then review the test data to completely understand the results.

**Tip #7 - Look for Confirming Diagnostics/Symptoms - The Second Opinion -** When oil analysis results come back indicating problems, take the time to see if other technologies on that system are showing alert indications (increased vibration readings, rising operating temperatures, surface hot spots). The system operator may also have noticed poor or erratic response, excessive noise or an inability to reach full load or full speed. Multiple alert indications signal that it is time to act.

**Tip #8 - Gauge Your Response - Don't Under or Over React -** When faced with a confirmed abnormal oil analysis report, take it for what it usually represents - an early warning. With a well-planned oil analysis test program, you often have time to plan your next step. In reviewing all data, remember that although sharp up or down shifts may indicate a serious problem, one sample is not a trend. More often than not, the correct response to a single elevated reading is to immediately resample and retest to confirm the initial data. However, also be wary of the most common, usually incorrect response to a bad sample report - an oil change, a little time and another sample will cure the problem. Ailing equipment rarely cures itself.

**Tip #9 - Get Into a Report Reading Routine -** Set up a specific time and place to review your reports. Read reports before scheduling the next day's activities so any investigation of detected conditions can be factored into the production timetable.

**Tip #10 - Read Your Reports Today -** Sometimes oil analysis reports are not read until it is too late. In addition, there is generally a small window for taking resamples to verify a condition. Much time and effort is spent in creating your lab reports and it is to your advantage to use this valuable tool timely and consistently.

Source: Practicing Oil Analysis, May-June 2003

Technical Services  
Universal Lubricants, Inc.  
June, 2003  
0603.2