



## Technical Topic

# Used Oil Analysis for Natural Gas Engines

The natural gas industry understands the importance of monitoring equipment to improve plant reliability and reduce costs. One important way to monitor engine performance and get valuable data on equipment health is through Used Oil Analysis (UOA). This technical topic answers some key questions about used oil analysis for natural gas engines.

## Why test used oil?

Used Oil Analysis identifies changes in the oil and/or engine condition, provides early warning of concerns, assists in troubleshooting equipment, and maximizes oil, filter, and engine life. Thus, UOA reduces your operating and maintenance costs. UOA benefits are as follows:

- **Longer engine life**
  - Equipment life can increase 10% to 100% between overhauls.
- **Longer component life**
  - Contamination identified by used oil analysis can help avoid crankshaft damage in engines, resulting in fewer repairs or replacement parts.
- **Increased equipment reliability**
  - Loss of production revenue could range from hours to many days of production. The cost of lost production is many times the cost of the lubricant.

We were among the first to pioneer oil analysis programs for industry, including Signum Used Oil Analysis for the natural gas industry. Since its inception, it has yielded millions of dollars in cost avoidance, savings, and/or increased revenue.

## What type of laboratory tests are used in oil analysis?

Our Signum Laboratory tests for natural gas engine oils include:

- **Viscosity** - Oils with too high or too low of a viscosity may not lubricate your engine properly. Measured by the time for used oil to flow through a calibrated capillary tube at 40° C and 100° C
- **Oxidation and Nitration** - Prolonged, elevated readings of excessive oxidation and nitration levels result in sludge, varnish, and lacquers that shorten engine life. Measured by IR (Infrared)
- **Total Base Number (TBN)** - A measure of lubricant depletion and degradation of service. Measured by ASTM D2896 or ASTM D 4739 test methods



- **Total Acid Number (TAN)** - The change in TAN is useful in monitoring levels of acidic material in the lubricant. This test is recommended for landfill gas engines. Measured by ASTM D664 or ASTM D974
- **Water** - Water in used lubricant reduces engine life. Various tests can be used. FTIR (Fourier Transfer Infrared) method is commonly used in this measurement
- **Glycol** - Glycol in used lubricant reduces engine life and indicates coolant contamination in the oil. Measured by ASTM D2982
- **Metals** - Typical Wear and Contaminants metals are recorded. Can be measured by ICP (Inductively Coupled Plasma)

## Why should you consider the Signum used oil analysis program?

With our many years of field experience, equipment inspection, and used oil monitoring, we have an excellent view of the relationship between physical properties and the end of serviceability of the lubricant. The limit to longevity may be the normal service life of the lubricant in that equipment, or it may be hastened by contamination or severe operating conditions. Therefore, we establish control limits for customers to use as guidance to change the lubricant. This approach is more cost effective than a time-based maintenance program.

In order to interpret data on analysis of used lubricants, a person must have certain knowledge of the tests themselves, of the conditions under which the sample was taken, of the engine in which the lubricant was used, and of the conditions under which it was operated. Our engineers team with customers to assist in interpretation of used lubricant data through training, troubleshooting and consulting.

We also work with the builders of major equipment to develop products that will protect new engines. Because of these cooperative programs, the builders can design their equipment to greater performance requirements. Working together in this way enables the user to ultimately reach optimum levels of operational performance and equipment reliability.

No one knows Mobil lubricants like we do. Our laboratories maintain an extensive database on lubricants in service. No other lubricant company or laboratory has the number of field engineers that understand your equipment and operation; and no other lubricant company or laboratory has as an extensive used oil analysis database for the natural gas industry.

Our excellent products, programs and people are the reasons our customers can achieve the greatest value out of their used oil analysis program. We recommend the use of the Signum UOA Program with our Pegasus gas engine oils.

For further information on Signum Used Oil Analysis and Mobil Pegasus gas engine oils, contact us at [www.mobilindustrial.com](http://www.mobilindustrial.com) or call us at 1-800-MOBIL-25.



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