AGAT Laboratories

Natural Gas Engine

Equipment Reliability and Lubricants Testing Services

Natural gas engines are unique. They burn a variety of gases including sour gas containing sulphur, sweet gas, wet gases containing components like butane and finally, landfill or digester gas composed primarily of methane and carbon dioxide that may contain halogens like fluorine and chlorine. These unique fuel types call for monitoring gas engine conditions that are themselves unique, such as concern with exhaust emissions, lubricants that range from no, low or high ash oils, depending upon engine design and oil degradation caused by the accumulation of oxides of nitrogen commonly called nitration.

The lubricant testing that should be applied as part of a regularly scheduled condition based monitoring program for natural gas engines should include the following oil analyses:

- Kinematic Viscosity
- Spectrographic Analysis including wear metals, additives and contaminants
- Water and Glycol Contamination
- Acid Number (for dual fuels, add base number)
- Nitration/Oxidation/Soot Percentage by FTIR analysis
- Recommended Lubricant Testing Package 30-402

A Note on Sulphated Ash

Natural gas engine operation tends to create deposits of sludge, varnish and a fluffy grey ash residue made up of metal sulphides resulting from depleted detergent/dispersant additives. This ash residue helps to prevent exhaust valve recession by cushioning the valve face. Hence the oil type recommendation of no, low or high ash oil, depending on natural gas engine design.