

# TRIBOLOGIK®

## NEWSLETTER

ISO 17025:2005

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OCTOBER 2013

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### Fuel testing:

In the September 2013 issue of this newsletter, we have seen that water, bacteria, sediment including other solids are the most frequent fuel contaminants. They seep into tanks when carried, transferred or mixed leaving left overs at the bottom of storage tanks.



Condensation during the summer, the formation of ice crystals in cold weather, damaged caps and gaskets and insufficient precautions taken by shipping personnel are other causes of contamination.



In those conditions, even the most reputable suppliers can't guarantee that the fuel just delivered is 100% contaminant free. Due to the aforementioned, consider testing your fuel after each delivery.

Fuel testing before using is a low cost precaution against engine failure and breakdown as well as a proof of compliance with the Government laws and regulations.

### Currently Used Fuel Tests

Following is a list frequently used basic tests to control the quality of your fuel:

- **Karl Fischer** : water is the primary cause of fuel pumps and injectors corrosion. It creates great opportunities for the emergence and development of bacteria. These bacteria, together with by-products of corrosion, are the primary causes of filter plugging. The Karl Fischer water titration method measures and reports water content in percentage (e.g. 0.005% = 50 ppm).
- **Viscosity** : whether too high or too low, inadequate viscosity can cause damage to engines and fuel systems. Higher injection pressure resulting from high viscosity fuels accelerate the wear of gears and pumps. Fuel is harder to pulverize, which leads to



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difficult engine starts. Particular attention should be paid in low temperature operations, such as turboreactors and operations in cold weather environments. On the other side, the lubricity of low viscosity fuels may not provide sufficient lubrication to pistons, cylinders and injectors.

- **Sulfur Content** : low sulfur diesel fuel will tend to plug filter less quickly, reduce emissions and prevent corrosion. In addition, sulfur content in diesel fuels for road, off-road and rail applications (locomotives) as well as marine and fixed industrial engines is strictly regulated by Environment Canada and the EPA. New, more stringent limits will be enforced in June 2014 for large marine and industrial engines.
- **Flash Point** : the Flash Point test determines the temperature at which the sample lubricant flashes when exposed to an open flame. It detects contamination of relatively non-volatile materials with volatile materials. If too low, the flash point may indicate the presence of gasoline in diesel, which may cause damage to diesel fuel pumps and injectors.
- **Density** : the density of fuel helps determine the fluid's composition and describes the ratio of mass and volume of the liquid, usually in Kg/L units. Higher fuel density confers more power to the engine combine with better fuel efficiency.
- **Ash Content** is the percentage by mass of non-combustible residue after complete combustion of the sample. A low ash accumulation reduces the risk of clogging. Abrasive solids and soluble metallic materials are the root causes of ash formation. Abrasive solids are significant causes of wear and damage to fuel injection equipment, pumps, pistons and rings. Whereas they have little effect on wear, soluble metallic materials result in combustion deposits.
- **Metals** : Elemental Analysis by ICP (inductively coupled plasma) detects up to 23 elements, including sulfur, that may contaminate fuel due to mechanical wear, contamination or additive depletion.

**The aforementioned testing package is not exhaustive. A number of additional tests may also be prescribed for fuel. We will present these tests in our next issue.**

**For more information, contact your technical representative.**

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### WEBINAR – Manage your Oil Analysis Program using the Tribologik® web site

By **Nicholas Reich**

**Date :** Friday October 25, 2013

**Time :**

- **Ontario, Manitoba : 12:00 PM, Toronto time**
- **Saskatchewan, Alberta : 10:00 AM, Calgary time**

**Duration :** 30 minutes

**Reserve now with Nicholas :** [nreich@tribologik.com](mailto:nreich@tribologik.com)

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Global **Meet**

### You're invited.

You've been invited to a web meeting starting lundi 9 juillet 2012 at 11:35 Canada, Québec.

**Have the meeting call you.**  
Click the Connect Me link below. No need to dial-in.

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**Not at your computer?**  
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