TRIBOLOGIK®
NEWSLETTER

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FEBRUARY 2014

In this Issue :

Total Hardness Analysis for Coolants

As stated in a previous issue (April 2011), over 40% of all maintenance problems on diesel engines can be attributed to poor maintenance of the cooling system.

Coolants allow for the raising of boiling temperature and/or improving resistance to frost. They prevent engines from freezing and overheating and protect components against corrosion.

Systematic and on-going analysis of cooling fluids allows for detection of wear signs in the cooling unit (radiator, water pump, heating, thermostat), as well as monitoring the alteration of anticorrosive, anti tartar, anti acid and anti freeze properties of the coolant over time.

Coolants usually consist of a 50-50 mixture of water with ethylene glycol (high heat transfer) or propylene glycol (more toxic, less popular), plus a number of addivives (borates, molybdates, silicates, nitrates, potassium, etc.) to be described in a subsequent issue. Water provides the best heat transfer performance. However, water freezes at low temperature and the glycol component is essential to protect it against freezing. In fact, for temperatures below -35 °C, a 60/40 mixture is recommended.

Many tests are prescribed to test the quality of the coolant. We will discuss them in a future issue of this Newsletter. In this issue, we will focus on total hardness.

Total Hardness (TH)

It is critical that all cooling system heat exchange surfaces remain clean at all times. However, antifreeze compounds decompose under high temperature, producing a corrosive acid or tartar in the cooling circuit.

Water, which evaporates at high temperatures, is also subject to this decomposition process. Cooling systems contain calcium and/or magnesium from water supplies and water hardness is directly related to its calcium and magnesium content: hard water refers to water that contains a high level of calcium, magnesium and other minerals which can severely damage metal piping systems.

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Low hardness can leave water aggressive and corrosive. High hardness contributes to excessive tartar formation on walls and equipments. Water hardness compounds can lead to water pump seal failure, clog the cooling system, shorten their life span and require more detergent for a same result. Maintaining appropriate levels of hardness will prevent water from becoming corrosive or scale-forming.

The level of dissolved solids in coolant water, including calcium and magnesium, is generally referred to as “total hardness”, reported in parts per million (ppm). Water that contains over 180 ppm of these minerals is considered “hard water”.

The harder the water being used in an engine coolant, the greater the amount of scale formation. Or, said otherwise, as the concentration of these minerals increases, so does the probability that you will have cooling system scale problems. Only 1/16 in. of scale will reduce cooling system heat transfer efficiency by 40%. Hard water scale can therefore block a cooling system’s ability to transfer heat, resulting in overheating. This is why testing the total hardness of your cooling fluid is so important.

On the other hand, the pH and alcalinity may have an incidence on the results of the total hardness test. It is therefore important to perform these three tests together.

For more information, contact your technical representative.

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

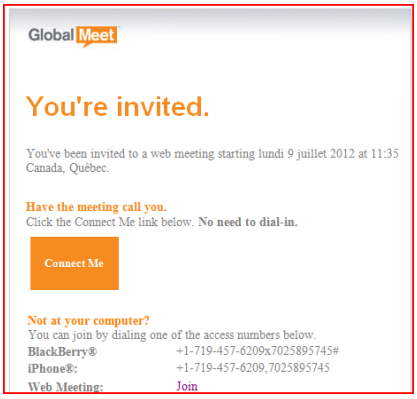
By **Nicholas Reich**

Date : Friday February 28, 2014
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



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