



# TRIBOLOGIK®

## NEWSLETTER

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### Why Test the Rate of Biodegradability of Lubricants?

Testing the rate of biodegradability of your lubricants not only contributes to the protection of the environment but it is also a financial safeguard for marine operators, excavation and construction companies working in or close to hydro resources.

In the U.S.A. indeed, Section 311 of the Clean Water Act defines “any substance that leaves a sheen, emulsification, or discoloration, as a pollutant and can be subject to appropriate fines...” (which can be very high).

Pertaining to navigation specifically, the U.S. Environmental Protection Agency (EPA) requires that all vessels over 79 feet use an “Environmentally Acceptable Lubricant” (EAL) in oil to water interfaces. The EPA defines an EAL as a “Lubricant that is biodegradable, exhibits low toxicity to aquatic organisms and has a low potential for bioaccumulation”.

In Canada, water governance is shared between the Federal Government and the Provinces. Regulations contain provisions similar to those of the United States i.e. requiring machinery working in or close to rivers and lakes to use biodegradable lubricants.

In both countries, therefore, testing the rate of biodegradability of lubricants provides an assurance of compliance with environmental and water quality regulations.

### **95% of the lubricants in use are not biodegradable**

According to Simon-Mark LeFrançois (Reducing Environmental Footprint for Lubricating Oils at Remote Construction Sites), about 95% of the lubricants in use are from the conventional mineral-based (i.e.: petroleum-based) oil that is obtained from the distillation of crude oil, a non-renewable fossil fuel. They include most engine oil on the market as well as hydraulic, gearbox, bearing compressor, transmission, brake oil and other lubricants. During usage, they degrade and become contaminated while losing their lubricating properties, thereby becoming waste. They contain hydrocarbons that cause severe damage to the environment especially when they are discarded in water.

It is therefore no surprise that used lubricating oils (ULOs) were identified as the largest source of liquid organic hazardous waste in Canada by the Canadian Council of Ministers of the Environment (1989), and their toxic effects have been acknowledged through many studies since then.

## Biodegradable Oils

Testing your lubricants for biodegradability allows to distinguish between persistent and biodegradable oils as well as between the two types of biodegradable oils:

- **Inherently (potentially) biodegradable** oils are base oils that show > 20% and <60% degradation within 28 days.
- **Readily biodegradable** oils are defined as degrading 60% or more within 28 days.

Readily biodegradable oils include non or minimally toxic vegetable base oils and some synthetic lubricants. Petroleum based oils are not readily biodegradable. Discharges or spills float and produce a visible sheen on waters, their adjoining shorelines, or into conduits leading to surface waters.

These lubricants are classified as pollutants under Section 311 of the U.S. Clean Water Act (CWA), the Oil Pollution Act of 1990 (OPA) and under Environment Canada's Domestic (hazardous) Substances List.

Plants and animals may experience harmful or fatal effects when coated with petroleum-based products. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area and limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

Your Tribologik® biodegradability test reports will inform you on the biodegradability of your lubricants, their compliance with EPA and Environment Canada's regulations and prevent you from paying non-compliance fines which may add up to many thousands of dollars per day.

**Contact your account manager for further information.**

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Source: Environment Canada

U.S. Environmental Protection Agency

Simon-Mark LeFrançois :Reducing Environmental Footprint for Lubricating Oils at Remote Construction Sites. (September 2013)

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