

# **TRIBOLOGIK®**

## NEWSLETTER

ISO 17025:2005

[www.tribologik.com](http://www.tribologik.com)

---

April 2015

In this issue :

- [Local Training Session : INTRODUCTION TO OIL ANALYSIS](#)
  - [ANALYTICAL FERROGRAPHY – Part 1](#)
- 

### New in your Area: Training Sessions INTRODUCTION TO OIL ANALYSIS

Tribologik Corporation has initiated a series of local training sessions on oil analysis. Based on our experience with major industrial corporations, energy suppliers, public utilities, aviation, national defense, railroads, transit authorities and multinational companies, a Tribologik® oil analysis specialist will travel to your area, city, town or facility and provide you and your colleagues a full curriculum on the benefits of oil analysis and condition monitoring.

Please contact us for further information on the content, schedule and prices:

**TRIBOLOGIK CORPORATION**

**USA: (312) 800-2888 ext. 204**

**Canada: (514) 383-6330, Ext. 34**

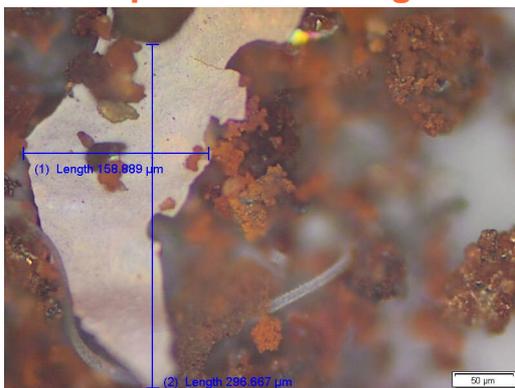
or

[info@tribologik.com](mailto:info@tribologik.com)

---

### ANALYTICAL FERROGRAPHY

#### **A Sophisticated Diagnostic Procedure – Part 1**



Analytical ferrography is a sophisticated diagnostic procedure using a microscope to detect and photograph large wear metal particles up to 300 µm (microns).

As an example, the picture on the left not only shows a wear particle, but it specifies the type of wear (bearing), displays its shape and discloses its dimensions : 158,899 µm (width) X 296,667 (long).

Analytical ferrography is not the only test for detecting large wear metal particles. It is however the only test able to identify the type of wear with a high degree of accuracy. It is somehow the ultimate complement to a number of analyses prescribed in order to determine the condition of your mechanical equipment.

## A variety of tests

The friction and wear of metallic parts of a poorly lubricated piece of equipment or a component can be a cause of generation of metal debris. These debris are an indication of the severity of wear and ultimate machine condition.

A variety of tests are used to detect these particles. Spectrometric analysis (spectroscopy) is an effective method for monitoring small particles. This technology, however, is ineffective in detecting particles larger than 6  $\mu\text{m}$ . That is where Analytical Ferrography is paramount.

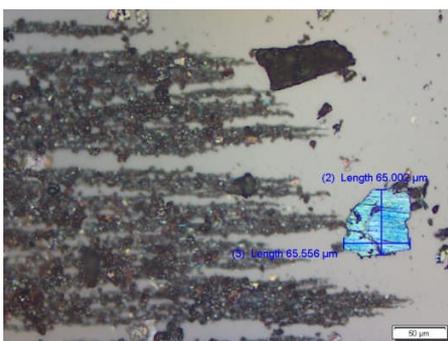


Larger particles through Analytical Ferrography can indicate a severe, if not marginal or critical, level of wear of your equipment.

Depending on the type of equipment, there are three widely used tests for the detection of large particles:

- **Particle Counting** counts particle sizes greater than 4, 6, 14, 25, 50, and 100 microns in size. This test however does not make the difference between wear metal and non-metallic debris so that it is not possible to know whether they are wear metal or contamination particles such as sand or silica.
- **The particle quantifier index** test measures the mass of ferrous wear debris in a sample. It is therefore not applicable to components where non ferrous debris are the major wear fragments (See October 2014 Newsletter).
- **Direct Reading**, also called direct reading ferrography, measures the amount of small and large ferrous wear debris in an oil sample to indicate the change in the rate and severity of wear from the components of the machine.

Although very useful to determine the severity of wear these tests do not specify type, form or size of the debris.



## The benefits of analytical ferrography

This is where analytical ferrography comes in. Where direct reading indicates a severe or abnormal wear, analytical ferrography will proceed to an in-depth study of the metal wear particles.

In the picture on the left for instance, the microscopic analysis of the sample not only discloses the shape and size of the particle, but identifies the type of the particle, (in this case,) low alloy steel.

In doing so, this information permits identification of the source of degradation of your equipment and pinpoints the deteriorating part(s) or component(s).

[info@tribologik.com](mailto:info@tribologik.com)

**Your Equipment's Best Friend!**

The microscopic examination of wear particles, contaminants and oxidative degradation products in a used oil sample will also provide information on the evolution and wear mode of your equipment.

Under certain conditions, the color, morphology, quantity and size of particles allows for determining the wear mechanisms such as rubbing, cutting, fatigue, abrasion, etc.

To be continued in the next issue of Newsletter.

**For additional information, contact your account manager.**

---

[info@tribologik.com](mailto:info@tribologik.com)

**Your Equipment's Best Friend!**