

Ferrography provides a detailed “forensic science” analysis of the wear particles, contaminants and lubrication degradation, by interpreting the debris on a ferrography slide. By analyzing the colour, morphology, size, and surface detail of ferrous and nonferrous wear particles, an experienced analyst can provide accurate information about the type, severity and root cause of normal and abnormal wear.

A Fluid Life senior analyst provides a detailed report identifying the type, nature and probable source of the wear particles and contaminants, along with relevant photographs of the ferrogram. This data enables maintenance experts to implement predictive and effective actions based on the importance of this information.

When implemented correctly analytical ferrography can provide:

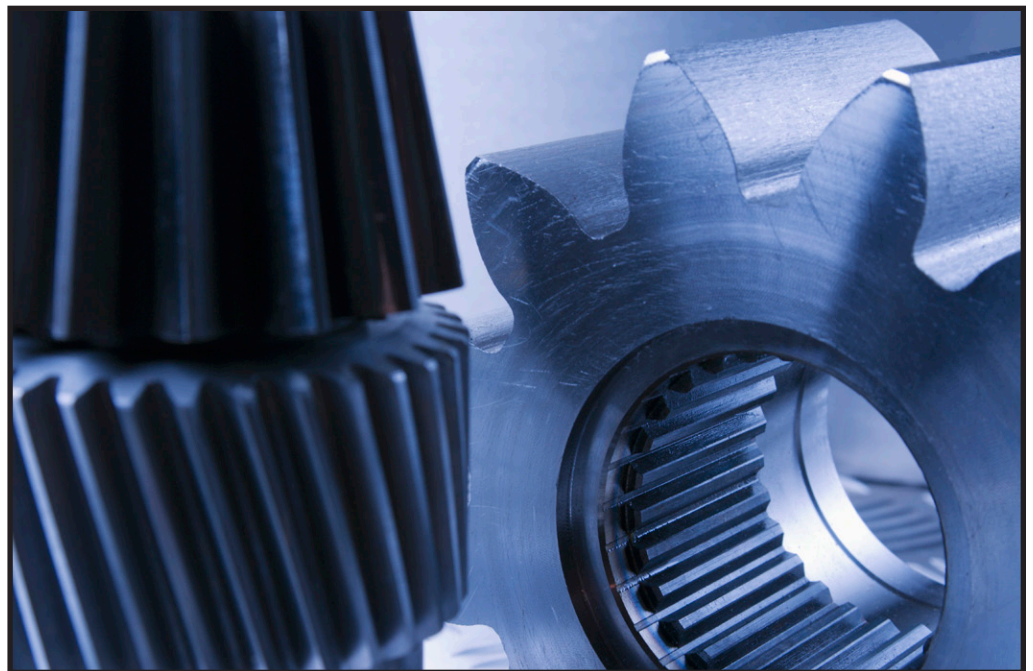
- A powerful diagnostic tool for your maintenance program.
- A progressive extension to your conventional sampling program.
- Excellent return on your oil analysis investment.

If the effort is taken to fully understand what analytical ferrography reveals, the benefits significantly outweigh the costs and maintenance professionals are wise to automatically incorporate it when abnormal wear is encountered and for routine testing to identify abnormal wear before it leads to failure.

Maintenance Solutions

Knowing the nature of abnormal wear or contamination in a lubricant, the maintenance technician can take a course of action, such as:

- Adjusting or optimizing oil change intervals.
- Deploying an advanced filtration system.



Ferrous Particle Identification

During the creation of a ferrogram, ferrous particles will deposit on the slide according to the particle size. Non-ferrous particles and contaminants will also deposit onto the slide.

Particle Identification:

Wear Metal	Colour Before Heating	Colour After Heat Treatment	Description
Case Hardened	Gray/Silver	Purple/Orange	These often align in chains amongst the other ferrous particles.
Dark Metallo Oxides	Black	Black	Black particles that lineup with the ferrous metal.
High Alloy Steel	Gray/Silver	Grayish white/Silver	High alloys will appear white in a chain like structure.
Low Alloy Steel	Gray/Silver	Blue, pink or red	Particles are also found in chains.
Red Oxides (Rust)	Reddish orange	Reddish orange	Polarized light readily identifies red oxides. Large amounts can indicate corrosive wear.
Medium Alloy Steel	Gray/Silver	Purple/orange/red	Ferromagnetic particles align themselves in chains with the magnetic field.

Other Particle Identification:

Wear Metal	Colour Before Heating	Colour After Heat Treatment	Description
Babbitt	Gray	Speckled depending on alloy	Often consist of lead, copper or tin. Appear throughout the slide.
Contaminants	Crystalline	Crystalline	Often dirt (silica), or other particulates which are semi-translucent. Appear throughout the slide and are often encircled by chains of ferrous particles.
Copper	Bright yellow/gold	Bright yellow/gold depending on alloy	Copper particles will be deposited throughout the slide.
Fibers/Cellulose	Various	Various (no change)	From filters or outside contamination source. Often long translucent strings that will appear throughout the slide.
Aluminum	White/gray	White/gray	Aluminum can be confirmed by wet chemistry. If aluminum is present it forms bubbles on the slide.