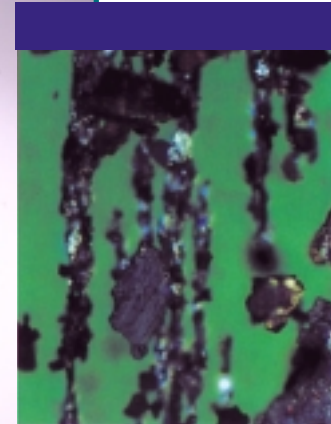


## Ferrography Laboratory

### Application:

In today's modern power generation, manufacturing, refining, transportation, mining and military operations, the cost of equipment maintenance, service, and lubricants are ever increasing. Parts, labor, equipment downtime, lubricant prices and disposal costs are a primary concern in a well run maintenance management program. Machine condition monitoring based on oil analysis has become a prerequisite in comprehensive maintenance programs. The Ferrography Laboratory plays a key role in such programs. It separates and concentrates wear and contaminant particles for microscopic examination. Particle size, surface characteristics and composition are then used to determine wear modes inside a machine so that maintenance recommendations can be made.



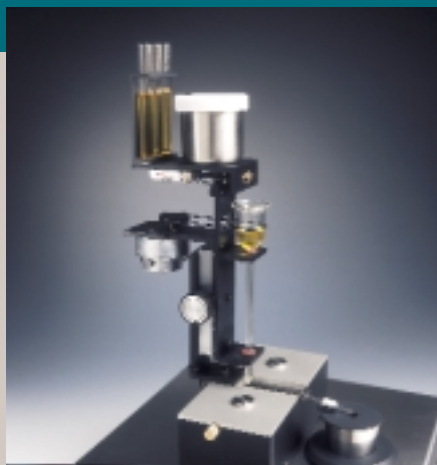
Wear particles indicate the wear mode inside a machine.

*"A Ferrography Laboratory for fast efficient, low cost separation and interpretation of wear and contaminant particles from used lubrication oils, hydraulic fluids, greases, coolants and fuels."*

### The Thistle Tube Concept:

T<sup>2</sup>FM stands for **Thistle Tube Ferrogram Maker**. The heart of the new T<sup>2</sup>FM is the glass thistle tube. The name comes from its unique shape resembling the thistle plant. The glass thistle tube provides a constant and efficient flow of sample into the substrate. The sample, after dilution, is poured directly into the top of the thistle tube. In seconds, the sample begins flowing across the ferrogram. The diameter and length of the capillary section of the thistle tube control the flow rate onto the ferrogram.

A rinse cycle is initiated as soon as the last of the sample has left the thistle tube. Solvent is dripped onto the lip of the thistle tube as it is slowly rotated, thoroughly rinsing the walls and cleaning it for the next sample.



The T<sup>2</sup>FM prepares a ferrogram more quickly than ever before. There is no delay time as sample is pumped through plastic tubing before reaching the ferrogram surface. Furthermore, the rinse may begin as soon as the sample leaves the thistle tube. The T<sup>2</sup>FM delivers the entire sample and all the particles contained therein onto the ferrogram surface. There is also no distortion of particles since the thistle tube concept eliminates the need for a pump.

A crystal clear rinse is obtained without fail for every ferrogram. There are no last minute drips of oil sample onto the ferrogram leaving distracting halos around the particles when viewed under the microscope.

### Bichromatic Microscope

This affordable bichromatic microscope is configured specifically for the examination of ferrograms with both reflected and transmitted light sources providing illumination from both above and below the microscope stage. Using a green filter in the transmitted light path and a red filter in the reflected light path, metal particles, which reflect light, appear bright red, whereas nonmetallic particles, which transmit light, appear green. Contact Spectro for detailed specifications.

### Video Camera and Software

A video camera connected to a computer displays, prints, stores and retrieves ferrographic images. Comparison of old ferrograms with ferrograms from recent lubricating oil samples allows determination of evolving wear modes inside a machine or engine.

*Spectro Incorporated is the only company dedicated exclusively to providing instrumentation, software and applications support for machine condition monitoring through oil analysis. Contact us for your instrumentation needs and complete turnkey systems for oil analysis.*

Your local representative for sales and service is:

### Main Components of the Ferrography Laboratory

- ▶ Model T<sup>2</sup>FM Analytical Ferrograph.
- ▶ Bichromatic microscope.
- ▶ Video camera.
- ▶ Video capture card.
- ▶ Image capture software.
- ▶ Optional industrial standard personal computer.

### Key Features of the T<sup>2</sup>FM

- ▶ Efficient separation of wear and contaminant particles from fluid samples.
- ▶ Rapid preparation of ferrogram.
- ▶ No deformation of particles.
- ▶ Separates particles up to 800 µm in size.
- ▶ Lower cost per sample.
- ▶ Uses fewer consumables.
- ▶ Achieves cleaner rinses.
- ▶ Easy to operate.

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