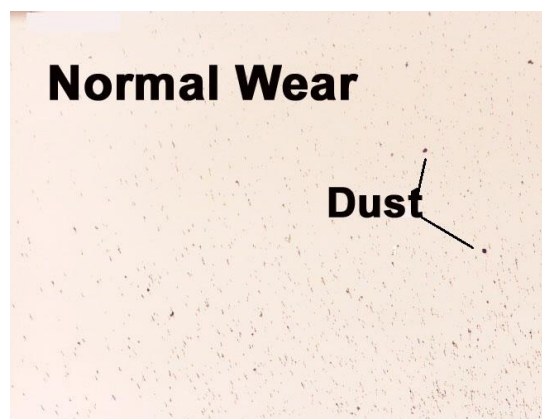


Ferrography

Ferrography is a powerful technique for the non intrusive examination of oil wetted parts of a machine and provides a solution to the limitations of spectrographic analysis.



Standard spectrographic analysis cannot read any particles larger than 10 μ m. Although it can occur at lower sizes in a general sense highly abnormal wear occurs at 8 μ m and above. Hence it is possible to have an oil sample full of large pieces of wear metal and yet automated spectrographic systems report back that the oil is fine for continued service.

Large wear particles can be generated by a variety of means including hard contaminants embedding themselves in softer material (eg silica or sand in tin) or by the cutting action of large coarse ferrous particles.

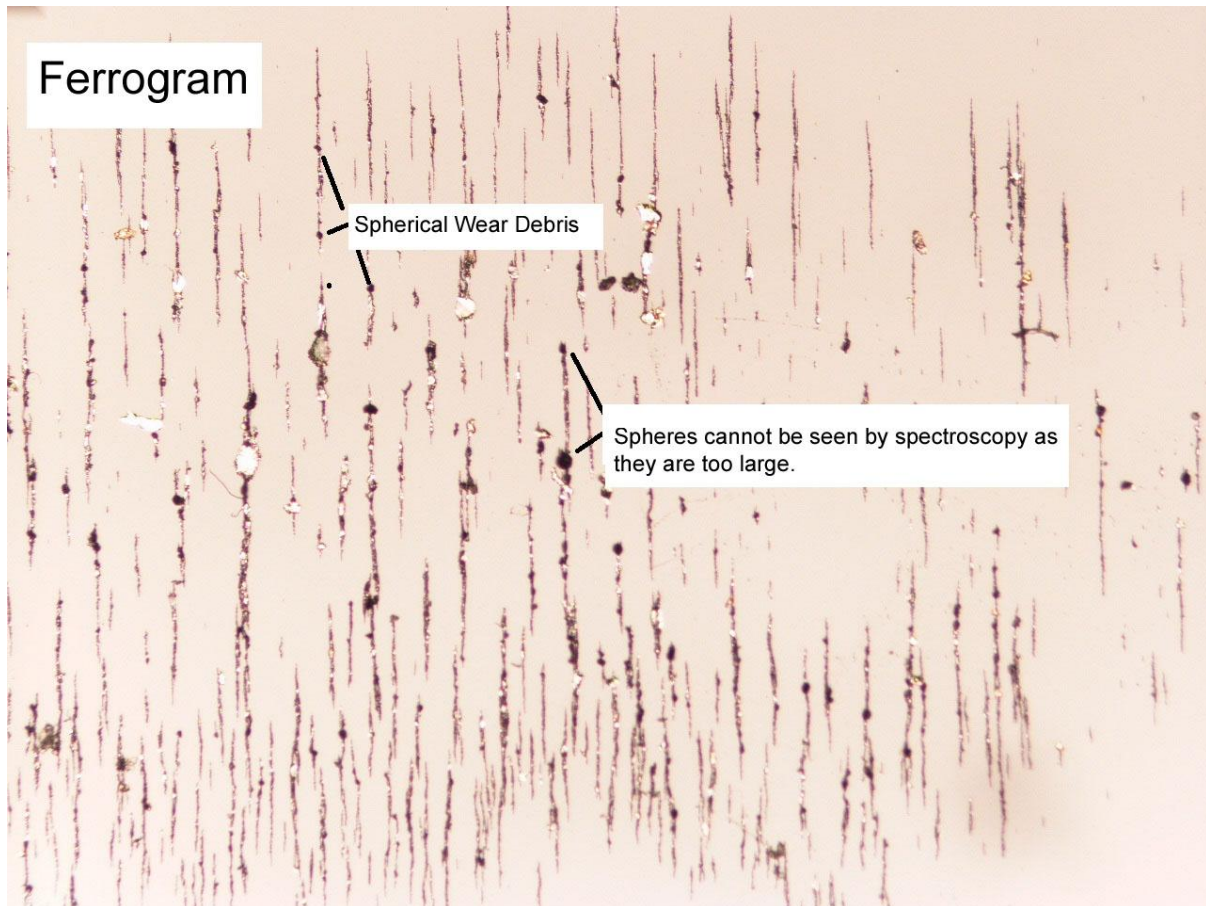
Ferrographic testing gets around the limitation of spectroscopic analysis by identifying sizes and shapes of ferrous and non-ferrous particles and also contaminants.

In addition we provide heat tempering of the resultant wear metals which can further assist in identifying the metals and alloys present in the sample.

Identification of the types of particles (by heat tempering) and size and shape (by visual inspection) are very powerful tools in indicating the condition of the machine and identifying the cause of any potential or existing problems.

(Ferrography cont.)

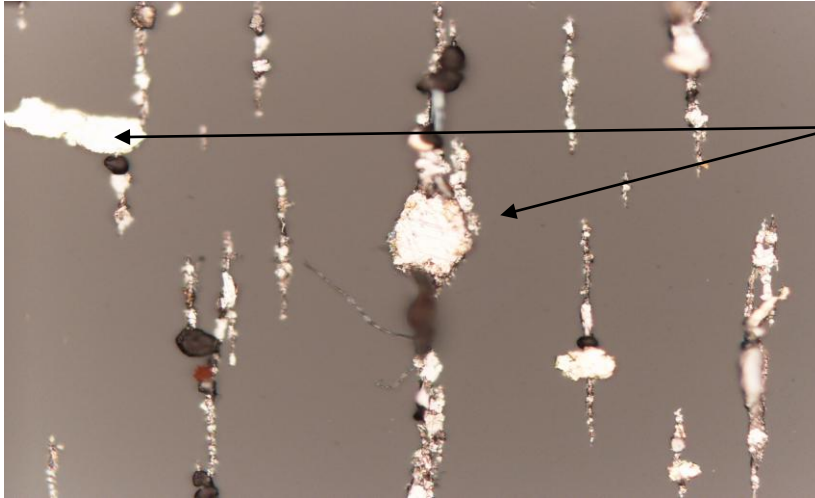
Some types of wear particles can be seen in the following photo.



Ferrographic testing is essential on critical gearboxes, blowers, gear-sets and differentials where abnormal wear can quickly lead to the spalling of gear teeth or bearings and ultimately premature failure.

The result can be further analysed by heat tempering. During this process alloys change colour whilst ferrous remains the same. The change in colour can give an indication as to where the wear debris is being generated.

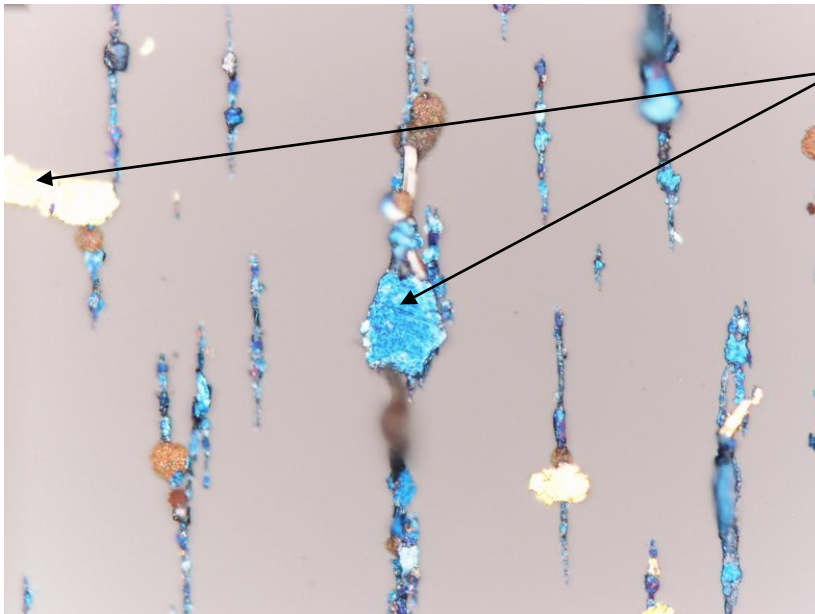
Natural Ferrographic Result



Ferrographic slide showing wear metals.

All particles have the same colour which suggests that they are all ferrous type material.

Same Result after Heat Tempering.



Same result after heat tempering.

Alloys and other metals have changed colour whilst ferrous particles have remained the same.

The colour of the result may give some insight as to where the wear debris is being generated.