

If you depend solely on Elemental Analysis by ICP to detect wear metal concentrations, you may not always know when a catastrophic failure is in progress.

Elemental Analysis by ICP (inductively coupled plasma) detects up to 24 metals that can be present in used oil due to wear, contamination or additives. But, only particles measuring less than 10 $\mu$  in size are seen. To determine if larger wear is occurring, Particle Quantifying or Particle Counting should be used in conjunction with ICP.

Particle Quantifying (ferrous density) exposes a lubricant to a magnetic field. The presence of any ferrous metals causes a distortion in the field, which is represented as the PQ Index, an arbitrary unit of measurement that correlates well with DR ferro large. If the PQ Index is smaller than iron ppm by ICP, it's unlikely there are any particles larger than 5 microns present. But if the PQ Index increases dramatically while the ICPs iron ppm remains consistent or goes down, larger ferrous particles are being generated and further testing or diagnostics are recommended.

Particle Count is the measurement of all particles that have accumulated within a system, including those metallic and non-metallic, fibers, dirt, water, bacteria and any other kind of debris. However, it is most useful in deterring fluid cleanliness in filtered systems such as hydraulics, turbines, compressors, auto/power shift transmissions, recirculation systems and filtered gear systems with a fluid viscosity of less than ISO 320.

When large ferrous wear is confirmed, microscopic analysis, such as Analytical Ferrography or Micropatch should be used to qualify the type of wear occurring and identify its source.