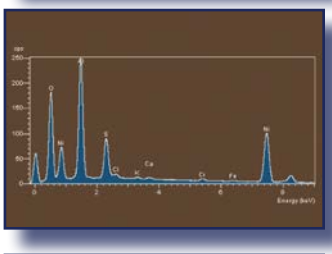
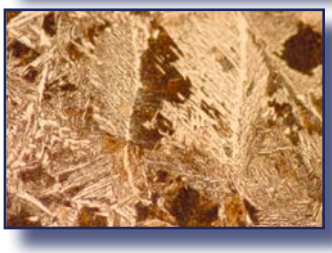
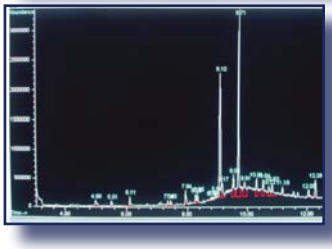
MDE Inc.

Materials Analysis







The staff of engineers and scientists at MDE is expert in performing evaluations to determine the root cause of materials and component failures. Our laboratory is fully equipped and capable of a broad range of analysis techniques.

Scanning electron microscopy (SEM) can vividly illustrate critically important minute defects and fracture features. The attached energy dispersive x-ray analysis (EDS) equipment detects and measures not only the elements present but can also illustrate variations in concentration that show contamination and improper material composition can lead to failure.

MDE also has numerous optical microscopes from low-power stereomicroscopes to high magnification compound microscopes. With this equipment, we can analyze and photograph fractures and surface defects. Polarized light microscopy is often used to characterize residues and deposits on the surface of a failed component. Metallographic polishing and etching techniques are used in conjunction with microscopy to reveal how heat-treating processes and service conditions alter the properties of metallic components.

Fourier Transform Infrared Spectroscopy (FTIR) is a tool used to generally characterize/identify the components of a sample. This is useful for comparing an exemplar material to a failed sample, reverse engineer a sample or to confirm the identity of materials. Residues, surface deposits and inclusions can be readily isolated and characterized to assist in the determination of the cause of failure. Samples too small to see with the naked eye may be isolated and chemically characterized using FTIR.

Gas Chromatography/Mass Spectrometry (GC/MS) is an extremely sensitive technique often used to identify oils and liquids. Chemical incompatibility between lubricants and plastic components can result in failures. GC/MS can be used to assist in the assessment of these foreign materials

These methods and tools combined with MDE's peerless expert consulting services ensure that your needs will be met from initial investigation to litigation support.

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