

MATERIALS LABORATORY SERVICES



- ***Metallurgical Examination***
- ***SEM/XRD Analysis***
- ***Standard Mechanical Properties Testing***
- ***Custom Component Testing***

M&M Engineering's Materials Science Laboratory offers a variety of services, ranging from metallographic examination to materials evaluation on a scanning electron microscope (SEM). All tests are performed according to ASTM or other standardized specifications.

The state-of-the-art laboratory also accommodates client-designed projects requiring nonstandard test rigs or conditions. Supporting M&M Engineering's activities worldwide, the Materials Science Laboratory is staffed by an experienced team of technicians.

The laboratory, which supports our engineers and scientists in the materials, mechanical, corrosion, and metallurgical areas to a diverse set of clients, includes a fully equipped machine

shop that can produce test specimens as well as specialty test equipment.

Metallurgical Sample Preparation and Examination

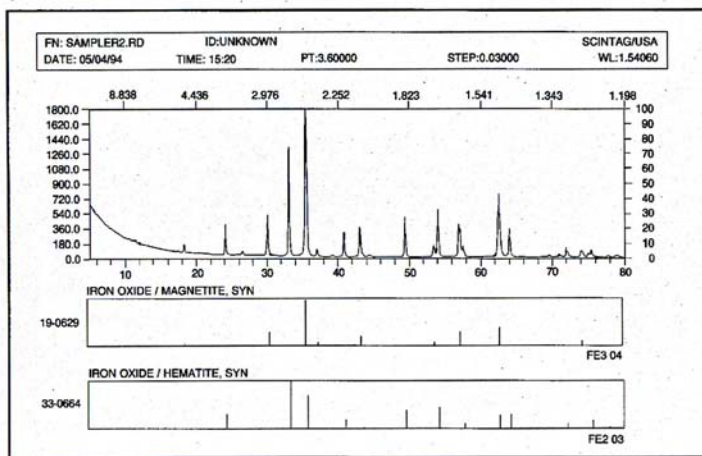
M&M Engineering's technicians can metallographically prepare and document the microstructure of a wide range of materials. Our laboratory has metallographic equipment for sectioning, grinding, polishing, and etching metals, ceramics, plastics, and composites. We also have two portable metallographic laboratories that allow our engineers and technicians to perform metallography in the field on large components or where examination by only nondestructive techniques is desired.



SEM Analysis

M&M Engineering operates a SEM equipped with an energy-dispersive x-ray analyzer. The SEM also has image processing capabilities for mapping elemental constituents and particle sizing and counting. This equipment is suited for high-magnification viewing and photography, and semi-quantitative compositional analyses on metals, ceramics, and powder samples.

X-Ray Diffraction Analysis



M&M Engineering operates a computer-controlled x-ray diffraction system to characterize and identify crystalline materials such as corrosion products and water or airborne residues.

Hardness Testing

M&M Engineering can perform both macro and microhardness measurements using calibrated test equipment on numerous metals. We can also perform hardness tests in the field using portable hardness testers.

Toughness Testing

We can test materials for static or dynamic toughness. Charpy impact tests are performed using conventional or instrumented methods at both low and elevated temperatures.

Tension, Compression, and Fatigue Testing

Different tests can be performed to analyze a material's strength, including tension and compression tests; fatigue (tension-tension, tension-compression, compression-compression, high-temperature); bending (rotational three point, or four point); and flare tests. Tests can be performed on components or representative samples prepared from components. Metals, ceramics, elastomers, biomedical materials or composites can be tested at ambient or elevated temperatures.

Component Testing

Many of our services can be used to perform component reliability or performance testing. Special test rigs can be constructed to cycle components mechanically to determine their endurance, compare the performance of equipment from different component manufacturers, or compare results to required performance criteria.

M&M Engineering's laboratory can accommodate metals, ceramics, rubber, composites, and plastics used in valves, bearings, piping welded shafts, and many other components.

Corrosion Testing

Our corrosion testing services include conventional laboratory tests, or in-plant tests. Corrosion specimens can be prepared, exposed, and examined by weight-loss, optical microscopy, and SEM in our laboratory.

We perform corrosion testing to address all anticipated modes of corrosion and adequately simulate operating conditions.

For more information contact:



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