

MEMORREX

Service  
Laboratory





# The Memorex Service Laboratory

The Memorex Service Laboratory has four main sections to meet your needs.

- Metallurgy
- Physical Testing
- Polymer Materials
- Chemistry

Each section is staffed by highly competent, innovative men and women working with excellent modern equipment.

The laboratory is ready to serve you. It prides itself on a three day turn-around complete with documented results.

It can provide you with service at your office or on the production line and is always available for sample preparation, selection and transportation. In addition to regular investigation, it often undertakes specification preparation, drawing review and similar engineering efforts.

Typical work handled by the laboratory includes failure analysis, product development, material identification and quality control testing. Consultation topics provided by our engineers include material selection, assembly, fabrication, safety, finishing, welding, fastening, soldering and related processing techniques.

# Metallurgy Section

Problems related to plating, heat treating, casting, forging and similar processes can be solved by the metallurgical branch of the Service Laboratory. Since compound identification is a matter of metallurgy and crystallography, the metallurgical section often provides this service. Like the other sections, it contains new equipment and uses the more recent techniques. Its staff is experienced in both report preparation and courtroom testimony.

## Typical Metallurgical Jobs

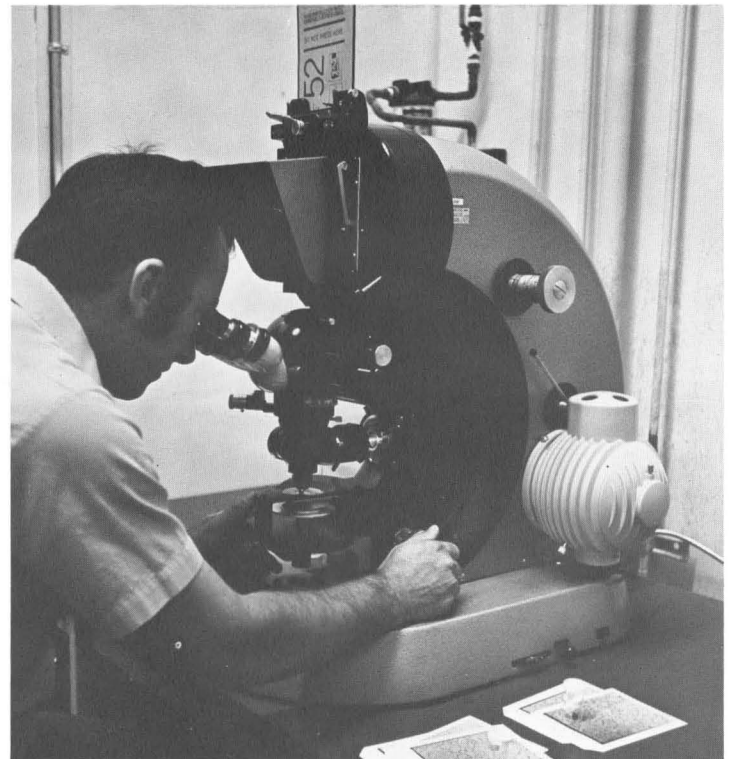
- Plating thickness measurement
- Young's Modulus measurement
- Grain size
- Case depth
- Temper determination
- Fastener evaluation
- Compound identification
- Contaminant identification
- Conversion coating evaluation
- Anodize evaluation
- Hardness measurement
- Residual stress measurement



The Picker X-ray Diffractometer can identify compounds, determine residual stress states, measure concentrations and identify many elements.



The mount preparation area of the metallurgical section is complete for cross-sectioning, grinding and polishing.



The Zeiss metallograph is equipped for light field, dark field, polarized light, and interference contrast observations with either a reflection or a transmission mode.

## Metallurgy contd.



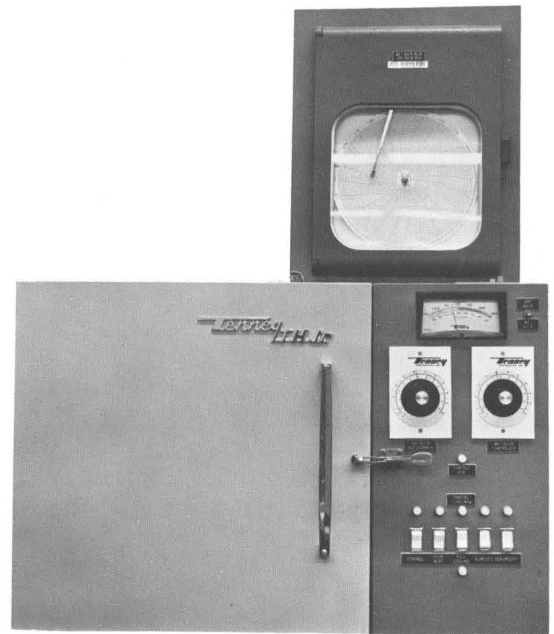
A macrocamera is used to record evidence for failure analysis.



The Tukon microhardness test machine measures the hardness of foil as thin as one mil. It can operate with a load as small as five grams or as heavy as five kilograms.

# Physical Testing Section

Many of the physical characteristics of materials can be easily measured by the Memorex Service Laboratory. Tensile strength, hardness, elongation, reduction-in-area, Young's modulus, spring rates, compressive strength, and other similar characteristics are readily determined. Other characteristics may require more time for measurement, yet the laboratory maintains a reputation of finding the most accurate, least expensive method for a particular job.

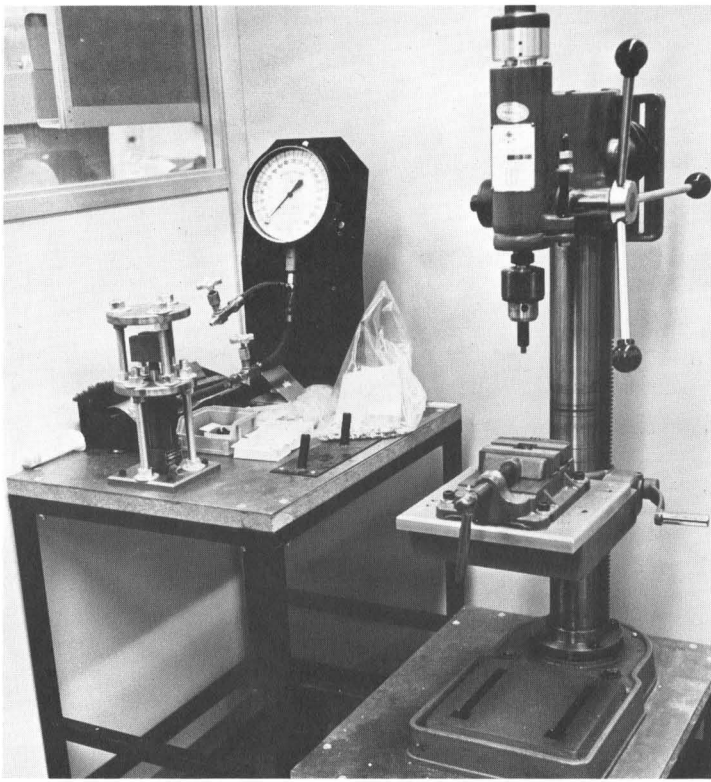


Humidity chambers such as this are available to determine corrosion susceptibility.



Paint and plating adhesion characteristics can be evaluated.





This machine exemplifies our laboratory's versatility in preparing test apparatus to suit special needs. It was built to measure torque strengths of fasteners and the tensile force exerted by a given torque in a fastener assembly.

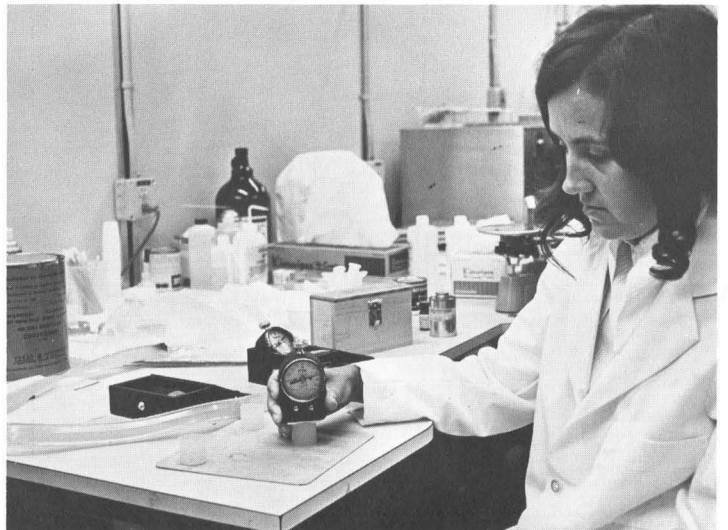


The Instron can exert as little load as 20 grams full scale or as much as 10,000 pounds. Load deflection curves are automatically printed during test.

The Clevite surface analyzer can measure and record the profile and roughness of nearly all parts.



Hardness measurements are possible on superficial scales, conventional Rockwell scales or even Barcol scales. Softer materials such as rubber can be evaluated with durometers.



# Polymer Materials Section

This laboratory section performs evaluation testing of new and existing material to establish standards or control existing standards for plastics, adhesives, rubbers, paints and foam products. It also develops processes for utilizing these materials by establishing pilot production operations before introduction to the manufacturing organization.

To accomplish its objectives of materials control, equipment is available for testing material properties for conformance with engineering functional requirements including physical properties and environmental stability.

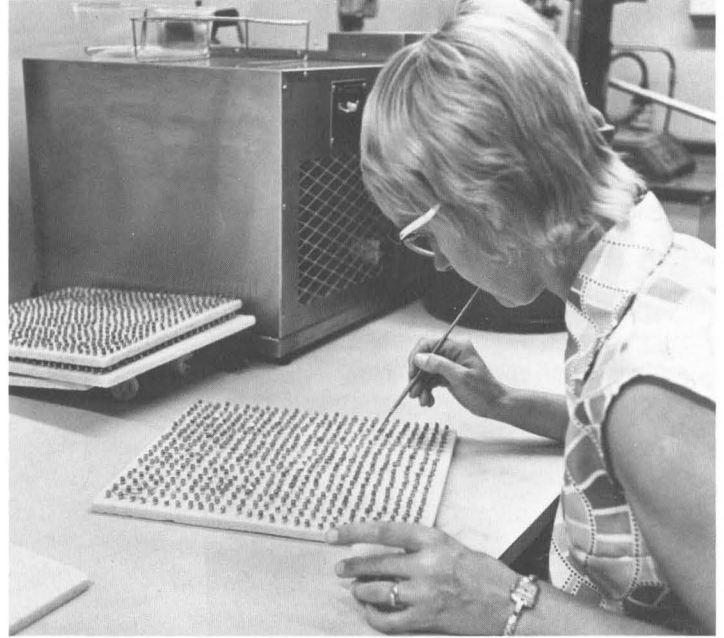
To accomplish its objective of process development, a variety of small scale processing units for cleaning, painting, stripping, marking, packaging and molding are installed.

The fluidized bed has been successfully used in many specialized coating operations

The Carver Press is used in many prototype fabrications of molded plastics and hot or cold pressed ceramics. It is also used for testing properties of rubber goods.



## Polymer Materials contd.



Pilot production runs often require special cleaning, marking, handling and packaging. The heat sealer to the left is used to maintain cleanliness of parts. To the right, is a color coding operation to identify transistors.



# Chemistry Section

The Chemistry Section of the Memorex Service Laboratory rapidly determines the composition of most liquids, metals, ceramics and plastics. It maintains over \$75,000 worth of instrumentation most of which was purchased in the last three years and it employs the most reliable of the new measurement techniques and procedures.

The atomic absorption spectrometer is used extensively with metals. Samples as small as two milligrams can be dissolved in suitable solvents and aspirated in a flame through which radiation from element lamps is passed. By measuring the amount of radiation absorbed, the percentage composition of an element can be determined to an accuracy as high as one percent of absolute. Amounts in the parts per million range can be detected easily.

The Beckman Accu Lab "4" Infrared Spectrophotometer provides rapid organic material identification.



The infrared spectrophotometer is helpful in identifying organics, particularly plastics (so are the two gas-liquid chromatographs). The research model chromatograph is particularly useful in identifying contaminants and, in practical applications, it can provide accuracy approaching one percent.

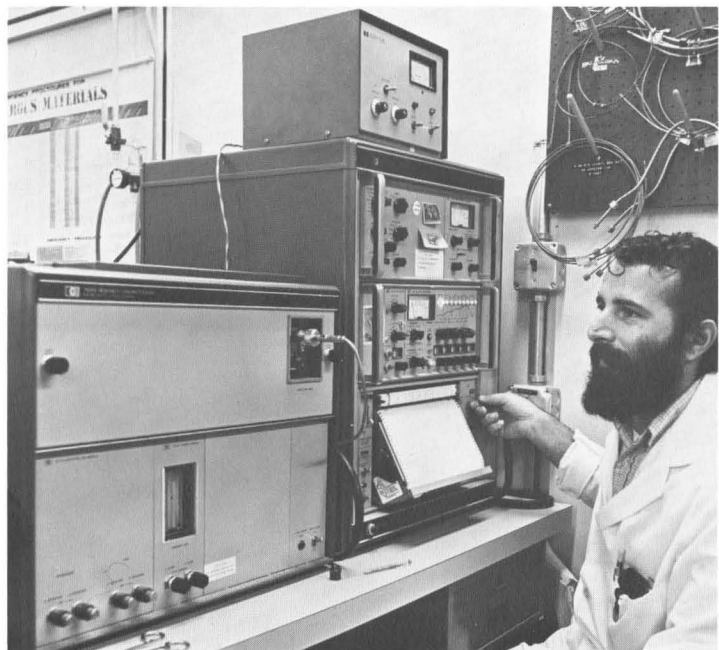
Interstitial solids such as carbon, are evaluated with a direct read-out LECO system. This system operates on approximately one gram samples.

Melting point apparatus, pH meters, titration tubes, and a full collection of chemicals are also available. Our balances range from one gram to 1200 gram capacity, with corresponding accuracy of  $10^{-5}$  grams to 40 mg.

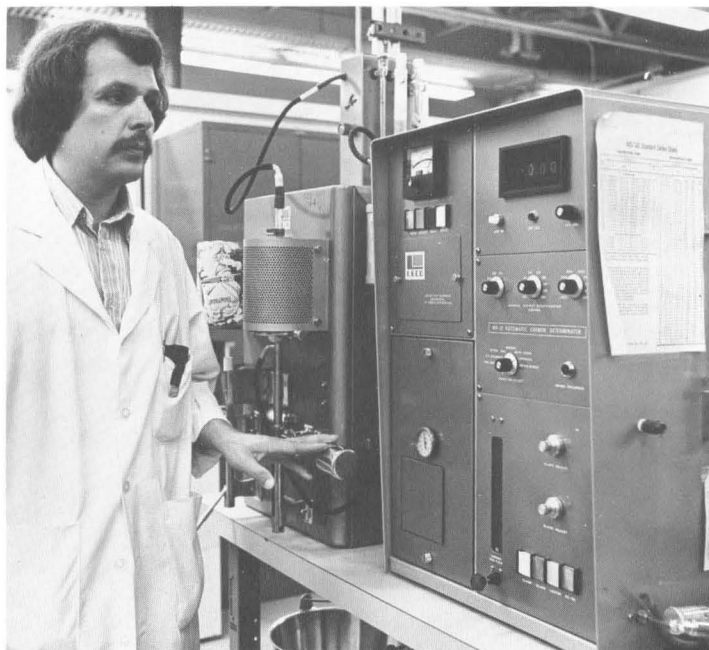
The Perkin-Elmer 305 Atomic Absorption Spectrometer can detect and measure concentrations of silver, aluminum, gold, boron, barium, beryllium, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, magnesium, manganese, molybdenum, nickel, lead, antimony, silicon, tin, titanium, zinc and zirconium.



## Chemistry contd.



The Hewlett-Packard Research Chromatograph 7620A is used in pyrolysis of plastics and solvent analysis.



The LECO instrument for interstitial determination.



A pH meter and related equipment.



Balances.

## **Additional Capabilities**

In addition to the capabilities of the foregoing sections, the Memorex Service Laboratory has excellent supplemental resources. It boasts a fine technical library. Arrangements exist with Stanford Research Institute for scanning electron microscopy. Cal Tech provides microprobe analysis support. Other organizations assist with emission and mass spectrographs, x-ray viewing units, and differential thermal analysis.



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