

Analytical Services

- Scanning electron microscopy (JEOL JSM-6300) with energy dispersive x-ray analysis
- Scanning electron microscopy (JEOL JSM-6300F) field emission very high resolution SEM
- Electron Probe Microanalyzer (JEOL JXA-8600) EDS + 5 wavelength dispersive spectrometers (fully computer controlled)
- Auger Electron Spectroscopy (JEOL JAMP-7800) with hemispherical analyzer, Zalar rotation and EDS x-ray detector
- Optical microscopy – Leitz Ergolux, Mitutoyo long working distance and Wild M3 stereo
- Profilometry – Dektak 3030 (10nm sensitivity)
- Microhardness – Zeiss
- Metallography – sectioning, mounting and polishing for all materials
- Nickel plating for edge retention
- Small particle (10µm sectioning)
- CO₂ snow jet, plasma & solvent cleaning
- Reverse engineering
- Litigation
- Patent Infringement
- Expert Testimony
- Forensics

Note: all data is digital and can be emailed for immediate transferal without extra charge.

For our fees:

http://www.gellermicro.com/price_list.pdf

For our certifications see

www.GellerMicro.com

Geller MicroAnalytical & Staff

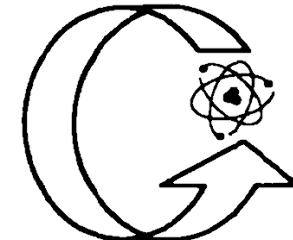
Geller MicroAnalytical Laboratory, Inc. is certified to ISO-9001:2000 by NQA and ANSI Z540A and 17025 by ACLASS, and 10CFR50, appendix B by Alion, providing analytical services and design and manufacturing of a limited number of unique products that are directly related to microanalysis. Some of these products, such as our magnification reference standard and ion sputter standards are NIST and NPL (National Physical Laboratory in the U.K.) traceable.

Our staff takes pride in performing state-of-the-art analyses on difficult specimens. As our satisfied repeat clients and publications reveal, we have developed several techniques for solving your analytical problems.

Rest assured your confidentiality will be maintained with the utmost care as our small company concentrates on satisfying your needs. We are only a phone call away. We often hear that delaying an analysis is usually more costly than waiting for the problem to go away... and history does have a way of repeating itself!

Quick Turnaround, all digital results

- Joe Geller, President. Surface analysis, interfaces, thin films, coatings, contamination ID, microscopy
- Marty Liu (PhD). Electron Probe Microanalysis, magnification standard calibration, software development
- Paul Engle. QC Manager, sample preparation, profilometry, & microhardness.



SELLER MICROANALYTICAL LABORATORY, Inc.

*...where a microgram of understanding
is worth a ton of guessing.*

Materials Characterization Expertise

The laboratory you are looking for...

- **ISO- 9000:2000 certified**
- **ISO-17025 and Z540A accredited**
- **Audited to 10CFR50, appendix B**

426e BOSTON ST., TOPSFIELD, MA 01983-1216
TEL: 978 887-7000 FAX 978-887-6671

Sales@GellerMicro.com

<http://www.GellerMicro.com>

Our Mission: to provide you with that missing information

Geller MicroÅalytical Laboratory has performed analysis in many fields including the semiconductor, hybrid device, metallurgical, medical device, glass, ceramic and others since 1985 and our industry experience pre-dates that by many years. We find that our knowledge from analyzing materials used in one industry often directly relates to the current state-of-the-art in others. It is this broad expertise that you will have at your disposal. Please note that we treat all customers as if we had signed non-disclosure agreements.

We can help you characterize your materials in the areas of process control, failure analysis, expert witness, patent litigation, forensics and many others. Our customers appreciate reports that are direct and to the point. We are never too busy to explain our instrumentation and how they can be applied to your problems. After the analysis we continue the support by explaining the experimental results in a language you can understand. Going one step further we may be able to assist in improving your product and processes... in complete confidentiality.

Geller MicroÅalytical Laboratory stays current with the state-of-the-art in our industry by making presentations, writing technical papers and volunteering with organizations such as the American Vacuum Society (AVS), the American Society for Testing Materials (ASTM), and the International Standard Organization (ISO). We also practice what we preach. We are certified to ISO-9001:2000 (NQA) and accredited to Z540A, and ISO-17025 (ACLASS) and audited to the NRC 10CFR50 appendix B. While these are very expensive programs for a small company we feel it is justified. It gives you confidence that we are well organized, here to stay, and technically competent in our craft.

Should we not be able to offer the proper technique for your needs we may be able to make referrals to other laboratories which, in our experience, have the needed expertise and experience.

Laboratory Applications: Surface Analysis, Scanning Electron Microscopy, Electron Probe Microanalysis, etc.

Ceramics, Glasses, Plastics and Metals:

- Stain characterization: including oxide, carbonaceous species, and drying residues
- RoHS: Reduction of Hazardous Substance Testing – for samples that fail with other methods
- Reverse engineering
- Polished cross and taper sections. Nickel coating to prevent edge rounding during polishing
- Diffusion studies: metals, oxides and nitrides, etc.
- Stoichiometry determinations: carbides, nitrides
- Analysis of loose powders (to micron size) for size, composition and coatings
- Quantitative compositional analysis & alloy identification- in particles down to 1µm
- Inclusion analysis
- Phase identification & size distributions
- Optical microscopy & image analysis
- Optical filter layer thickness and composition
- Corrosion identification and typing
- Fractographic analysis, failure modes and origins
- Implant analysis; carbon, nitrogen, oxygen, etc. for composition and depth distribution
- Surface roughness- flat or curved surfaces
- Microhardness on coatings to <10 µm thickness

SEMICONDUCTORS:

- RoHS: Reduction of Hazardous Substance Testing. We specialize in areas where other tests indicate problems
- Reverse engineering
- Bond pad analysis to determine oxide thickness and cause of discoloration and poor bondability
- Pinhole, void and defect analysis
- IC metallization scheme determinations
- Ceramic package analysis to determine contamination in Pb glass
- Quantitative analysis of seal and package glasses
- Adhesion and contamination analysis
- Thin/thick film composition, thickness and diffusion
- Solder composition analysis, eutectic

RoHS: REDUCTION OF HAZARDOUS SUBSTANCES ANALYSIS

We have the capability to analyze your products for RoHS compliance using the Electron Probe MicroAnalyzer. This instrument, coupled with our sample preparation can provide reasons why samples fail with XRF or other techniques.

WHY USE GELLER MICROÅALYTICAL?

We are always available, without obligation, for telephone consultation. Rush jobs can often be accomplished with overnight or next day service. Our reports can be emailed- at no extra cost. How can we do all this? Being a small company, we do not have the formalities, and we don't stand on ceremony. If we can fit an analysis in for you right away, we will. Our personalized service means you can discuss data directly with the analyst. Let us be your competitive advantage as so many others have done.

OUR PRODUCTS (PARTIAL LIST):

- “MRS” traceable stage micrometers and rulers (1X to 1,000,000X)
- Analytical standards- over 250 pure elements, alloys, glass, minerals
- Ion beam sputtering standards
- Vacu-Storr® vacuum desiccators
- Computer control for SEM, EPMA and Auger

THE ELECTRON PROBE:

The physics of this instrument are the same as that for the SEM with EDAX. The difference is the x-rays are diffracted off crystals. This gives you up to 100X the sensitivity and spectral resolution, meaning almost no peak overlaps compared to EDAX.

AUGER ELECTRON SPECTROSCOPY:

This instrument also uses an electron beam for sample excitation. Low energy Auger electrons are emitted and analyzed. These electrons come from the first few atomic layers of the sample making the technique surface sensitive to a few atomic layers. An ion gun sputters the sample to look under the surface.