Materials Identification and Related Testing Services

Chemical Analysis

Contaminant Identification

Investigative & Forensic Testing

Materials & Particle Characterization

Mechanical Testing

Microbiology
No matter what your Materials Testing needs may be, EMSL Analytical, Inc. has all the required resources. Most of our Laboratories operate 7 days a week with state-of-the-art equipment and are licensed with all necessary certifications. Our knowledgeable staff is ready to solve your most challenging laboratory testing needs and supply you with timely and accurate results that will aid you in making critical decisions.

**Laboratory Services**
- Chemical Analysis
- Combustible Dust Testing
- Consulting Services
- Contaminant Identification
- Deformulation
- DNA Testing
- Emergency Services
- Forensic & Failure Analysis
- Litigation Support
- Materials Identification
- Metallurgical Analysis
- Microbiology Laboratory
- Minerals, Oxides & Fiber Identification
- Polymer Analysis
- Quality Assurance
- Surface Analysis

**Industries Served**
- Ceramic Products
- Coatings, Adhesives & Sealants
- Food and Beverage
- Home, Health & Beauty
- Industrial & Consumer Products
- Medical Equipment & Devices
- Packaging
- Pharmaceutical
- Plastics and Composites
- Semiconductor and Micro-Electrical Devices
EMSL Analytical, Inc., (EMSL) is a national network of laboratories located in key cities and regions throughout the United States and Canada. Established in 1981, the company has expanded its analytical services and capabilities and now operates laboratories all striving for excellence in providing quality laboratory services in a timely and cost competitive manner.

Our diverse staff of over 585 employees consists of a wide range of expertise, educational background and capabilities. These dedicated and capable employees follow the lead and standard of care demonstrated by the owner and founder of the company, Dr. Peter Frasca, who, as a hands on owner maintains daily involvement in our laboratory operations, and dictates that our work is consistent with his EMSL Diamond Standard. This “Diamond Standard” includes the following:

**Quality Data** - Strict Adherence to our Quality programs and regulatory requirements which comply with the ISO 17025 guidelines so that our data is tracked, managed, reported, and verified to be accurate and reliable.

**Customer Dedication** - We strive to create lasting, mutually beneficial relationships with all clients. We solicit feedback from our clients and we are committed to responding quickly to any questions or concerns that may arise before, during, or after an assignment.

**Analytical Expertise** - We employ highly qualified and experienced chemists, geologists, physicists, mycologists, microbiologists, biologists, materials scientists and industrial hygienists to enhance our analytical abilities and expertise.

**Integrity and Ethics** - We insist that our employees uphold the highest ethics and standards. We maintain a “no-compromise” policy as it pertains to any ethical issue.

**Responsiveness** - We recognize that the timeliness of a report is as important as the quality of the data. We will not however, allow deadlines or the rush needs of a project to adversely impact our quality objectives.

**Technology** - We recognize the importance of new technology to better enable us to provide improved service. Extranet access to your data, customized reports, Laboratory Information Management Systems, and analytical instrumentation are continuously upgraded to enable continuous improvement of our service and capabilities.

**Value** – We believe that a business relationship with EMSL provides you with an excellent value. We provide you with a complete value package that includes all the components of the EMSL Diamond Standard.
Contaminant Identification

Unknown items found in materials and products typically result in manufacturers wanting to quickly identify the source. This process involves advanced analytical techniques and expertise. EMSL’s scientists have years of experience identifying contaminants from the environment, improper storage practices, and due to poor raw materials.

To accomplish this task, EMSL’s scientists often incorporate their chemical analysis capability of infrared spectroscopy (IR) to microscopy. EMSL Analytical has extensive experience in compositing the spectroscopic analysis by Fourier Transform Infrared Spectroscopy (FTIR) with microscopic examination.

EMSL’s IlluminatIR® interfaced with a light microscope and an attenuated total reflection (ATR) objective allows regions as small as 15 µm to be simultaneously observed and analyzed for identification of functional groups present in the molecular structure. This micro-FTIR analysis is valuable in such varied applications as the determination of contaminants, quality assurance, product comparison, screening for biological agents in powder mixtures, and the identification of unknown substances.

IR microspectroscopy regularly demonstrates its effectiveness in many applications. Other techniques such as elemental X-ray mapping and Auger electron spectroscopy (AES) are also frequently used to provide additional chemical and morphological information for unknown substances.

In addition, EMSL also routinely utilizes GC/MS, XRD, XRF, DSC, PLM, SEM/EDX, and LECO CHN & CS to help identify contaminants.

Materials Identification

Materials Identification (MID) is used in cases where the material in question needs to be identified. During analysis the sample is routinely subjected to optical and electron microscopy, X-Ray Diffraction (XRD), X-ray Fluorescence Spectrometry (XRF), Thermo-Gravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC) and Fourier Transform Infrared Spectrometry (FTIR).

In addition, Gas Chromatography/Mass Spectrometry (GC/MS) and a host of chemical tests may also be employed to identify the components within the sample.

Examples of MIDs include:

- Chemicals dumped on property
- Formation of material on walls, floors, in pipes and drums
- Material leaching from under floors or tanks
- Contaminants within potable water, oil and other liquids
- Unusual dust formation in industrial settings or manufacturing processes
**Forensics and Failure Analysis**

EMSL’s scientists are seasoned experts at conducting failure analysis. This experience allows them to handle all types of failure analysis projects to quickly and efficiently recognize failure indicators. This allows for the root cause of the problem to be identified.

Failure analysis is requested for a host of reasons. These often include premature failure of a product, strange odors and product discoloration. A variety of advanced instrumentation is often required to get to the root cause.

Materials typically tested range from packaging and adhesives, to coatings, composites and metals. EMSL also has environmental chambers that can be utilized to replicate various conditions that can be crucial in failure analysis.

**Deformulation**

Deformulation, or reverse engineering, is used to determine the identification and quantification of materials and ingredients used in raw materials or to produce a product. This type of analysis is regularly used by industry to deconstruct everything from adhesives and plastics to a variety of consumer products and pharmaceuticals.

EMSL’s scientists are often called upon to help companies with patent infringement cases, competitive product characterization and to investigate batch to batch variations found in various products.

Deformulation often requires the use of highly sensitive scientific instrumentation by seasoned scientists. This process can typically identify the chemical classes of both major and minor components of the products.

**Chemistry**

The chemistry laboratory provides testing primarily related to environmental sampling for RCRA (Resource Conservation & Recovery Act), SPDES (State Pollution Discharge Elimination System), NPDES (National Pollution Discharge Elimination System), CWA (Clean Water Act), SDWA (Safe Drinking Water Act), CAA (Clean Air Act), Environmental Site Investigations (Phase I, Phase II), Remediation Projects, Brownfields Land Revitalization projects and various Municipal, City, or State programs requiring the analysis of Drinking Water, Waste Water, Surface Water, Ground Water, Bulk, Waste, Soil, Solids, Oils, and/or Air Samples. Samples are analyzed for Organics (by GC-FID, GC-ECD, GC-NPD, and GC-MS), Metals (GF-AA, CV-AA, ICP, ICP-MS), and Wet-Chemistry (IC, etc.) following EPA, ASTM, NIOSH and OSHA Methods.

The chemistry laboratory currently maintains NELAC/TNI, AIHA and A2LA certifications and holds potable, non-potable and solid and hazardous waste certifications in twenty states. As part of the certification status, the laboratory complies with routine on-site audits from regulatory agencies and participates in a rigorous and extensive proficiency testing programs.

**Microbiology**

Our microbiology labs offer a wide array of analytical testing services to support the following industries or fields: Pharmaceuticals, nutraceuticals, cosmetics, personal care products, consumer products, disinfectants, antimicrobial products and device development, food safety and quality, biofouling, water quality, Aquatic Microbiology, pathogen outbreaks, environmental investigations, and indoor air quality.

Our internal QA/QC program is ISO 17025 compliant, ensuring that you will receive scientifically sound, legally defensible data. EMSL offers customized method development and special project design for non-routine analyses using ASTM, AOAC, FDA BAM, CTFA, USP, EPA, APHA, JIS, MIL-SPEC, ASM as well as other international testing methodologies.
**Surface Analysis**

Surface analysis at EMSL utilizes a wide array of techniques to solve customers’ problems related to surface science, surface engineering, coatings and thin films, contamination and corrosion. Depending upon the nature of the problem, techniques ranging from SEM/EDX, cross-section TEM, XRD, µ-FTIR, XRF, OES to AES can be applied to finding the right answers and solutions.

EMSL’s JAMP-10s scanning Auger Electron Spectroscope (AES) has a spatial resolution of 50nm in the Auger mode and 25nm in secondary electron image observation, and utilizes an Argon+ sputtering gun for surface cleaning and dynamic analysis. It is also equipped with a light element window Energy Dispersive X-Ray Analyzer (EDXA) which makes it a versatile instrument for both surface and near surface elemental analysis.

When the nature of a surface contaminant is in question, its chemical composition may be studied by AES and binding information by µ-FTIR. For coatings, SEM/EDX analysis will provide the information on the morphology, composition and on the binding and interdiffusion between the coating layer and the substrate.

Thin-film XRD analysis can reveal the texture and thickness of a thin film. If the microstructure or interface of a thin film sample is the center of the interest, high-magnification TEM can provide direct observation of structural and crystalline defects. XRF is useful for measuring the thickness of multi-layer thin-film structures, providing yet another non-destructive test method.

**Industrial and Consumer Products**

Industrial and consumer products testing services provide customers with answers to their unique product challenges. These services can be employed for individual components and finished products.

Testing may also entail durability, corrosion, flammability, stain and chemical resistance testing. In addition, environmental chamber testing can be utilized to simulate various environmental conditions that can impact industrial and consumer products. We are an approved Third Party Testing Lab by the CPSC.

EMSL has been called upon to provide these services for a wide range of products. Specialized scientists can determine a product’s lifetime, degradation, resistance and how a product will stand up to weather conditions.

**Emergency Services**

Unexpected situations can quickly cause the production of materials and products to come to a grinding halt. This creates numerous problems for customers ranging from lost production and financial hardship to the inability to supply products and materials in a timely manner.

EMSL’s scientists are available to quickly answer questions and tackle the most challenging cases. Projects can be put on a rush basis that will provide for a rapid, accurate, detailed analysis and solutions for EMSL’s customers.

From product contamination issues to product failures, EMSL can help. This emergency service allows customers to efficiently handle emergency situations.
Metallurgical Analysis

Metallurgical analysis can help answer a host of questions. EMSL’s metallurgical experts are trained in both traditional metallography techniques as well as the most current preparation methods.

This service can help uncover a metal’s true characteristics from its microstructure to its heat treatment condition. Services range from microstructure evaluations, hardness testing, plating evaluations, metallographic preparations and examinations, corrosion testing to hot hardness testing services.

EMSL’s metallurgical scientists combine the most advanced instrumentation with decades of experience to provide rapid, accurate and concise analysis for EMSL’s customers.

Polymer Analysis

Polymer analysis provides for the characterization of polymers. The chemical analysis of polymers typically requires advanced analytical techniques that include spectroscopic techniques such as: infra-red (IR) spectroscopy, Raman spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and ultra-violet/visible (UV/Vis) spectroscopy.

Because most polymer materials are used in a solid state, a number of traditional techniques may also be employed. These may include: x-ray diffraction, optical and electron microscopy, and thermal analysis.

Additional testing methods may be used to determine viscoelastic properties and dynamic mechanical testing techniques. Other techniques, used for the determination of colloidal scale structure may be used. These may include gel permeation chromatography (GPC) and small angle scattering (SAS) for the determination of colloidal scale structure.

Analytical services include:
• Chemical  
• Failure  
• Mechanical  
• Physical  
• Surface
Home, Health and Beauty

EMSL has extensive experience assisting the home, health and beauty industries with their testing needs. The laboratory provides stability studies and formulation services. The scientists at EMSL can work with virtually all material matrices.

Clients have ranged from Fortune 500 companies to new startups and entrepreneurs. No challenge is too great or too small.

Common requests for services include:
- Contaminant Identification
- Materials Identification
- Custom Synthesis Service
- Packaging Testing
- Deformulation
- Shelf Life Studies

Food and Beverage

EMSL provides a vast array of food and beverage testing services. The laboratory also has a certified HACCP team on staff and available to help address validation testing needs for HACCP Critical Control Points (CCPs). Once a Hazard Analysis is conducted and a HACCP plan is on file, EMSL can provide dependable and efficient analysis to fulfill HACCP CCP Monitoring Requirements.

Food and beverage testing services include:
- Adulteration & Quality Control
- Chemistry
- Contaminant Identification
- FDA Import Detention Services
- Food Allergens
- Method Development
- Microbiology
- Natural Toxins
- Nutritional Analysis
- Pesticides
- Shelf Life Studies

Packaging

Packaging can encompass a wide range of materials. These include boxes, cartons, vials, bags, bottles, cans and numerous other containers. EMSL’s scientists can test a wide array of packaging materials to ensure they can provide customers with their specific packaging needs.

Services include:
- Comparing Adhesives
- De-lamination Issues
- Durability Testing
- Failure Analysis
- Identifying Films
- Odor Identification
- Sterility & Contaminant Analysis
**Pharmaceutical**

In addition to offering a complete array of USP 797 testing services, EMSL also provides a host of other services for the medical devices industry. Medical devices typically need to adhere to the highest levels of quality and sterility.

Many of these cases encompass:
- Contaminant Identification
- Deformation
- Failure Analysis
- Litigation Services
- Metallurgical Services
- Microbial Analysis
- Physical Testing
- Polymer & Plastic Testing
- Toxin Testing

**DNA Testing**

Biological materials can be analyzed for their identities and quantities. The biological materials can be anything from human substances to animal remains, plants to fungi or bacteria contaminated samples. One of the common tests is DNA Barcode Analysis, which has been utilized for identification of samples from the environment, labs, hospitals and schools. Environmental pathogens such as *Salmonella, E. coli O157:H7*, fecal indicator-*Total Bacteroides* also can be analyzed quantitatively and the analysis reports have been used in courts for legal reasons.

Typical areas for DNA analysis by DNA expert in our lab are:
- Detection of Bacteria Pathogens: *Salmonella, E.coli O157:H7*, Histoplasma capsulatum, Mycobacterium tuberculosis, and others
- Environmental Molds: ERMI
- Fecal Indicator Test: Total Bacteroides qPCR
- Fecal Source Tracking Analysis: Human Total Bacteroides
- Food DNA Authentication
- Human Identity STR Analysis Using Buccal Swab samples from persons
- Insects Tracking DNA Analysis: Bed Bug DNA Test
- Plant DNA Authentication
- Property Protection Tests: Wood Rot Fungi PCR Analysis

**Medical Equipment and Devices**

EMSL offers comprehensive USP 797 testing services. USP 797 was developed to prevent the improper handling and contamination of sterile compounds for certain drugs or biologic preparations.

The guidelines impact not only the people who prepare the compounded sterile pharmaceuticals (CSPs) but also the areas where these drugs are prepared and stored including commercial and hospital pharmacies, clinics, doctor’s offices and other facilities. USP 797 recommends certain clean area designs, storage specifications, Quality Assurance plans which include environmental monitoring and employee training programs to accomplish the safe handling of these preparations.

These guidelines specifically address:
- Endotoxins
- Incorrect Ingredients
- Microbial Contamination
- Physical or Chemical Contamination
- Preparation of Incorrect Concentrations

EMSL’s scientists can help with these and other challenges faced by the pharmaceutical industry.

**Ceramic Products**

Ceramics are used in a wide variety of industrial and consumer products. EMSL offers ceramic testing services that ensure products perform as intended.

Hardness testing for ceramics is one of the most frequently requested services. It allows for ceramics to be identified for resistance to deformation, densification and fracturing.

Hardness testing is critical for many industrial applications of ceramics as well as medical devices and consumer products. Testing services can be used for raw materials, product development, and quality control to ensure product conformity.
Plastics and Composites

EMSL provides testing services to identify issues dealing with all types of plastics and composites. The laboratory has an arsenal of the latest scientific instrumentation at their disposal to answer these and other challenging questions.

Thermo-gravimetric analysis (TGA) and Differential Scanning Calorimetry (DSC) can determine specific melting points, transition temperatures and liquid/solid contents. X-Ray Diffraction Spectrometry (XRD) determines type and concentration of crystalline components.

Fourier Transform Infrared Spectrometry (FTIR) can determine the type of materials and many of its component materials. Microscopy using optical and electron microscopes is useful for identifying solid components and measuring particle sizes and thickness.

Coatings, Adhesives and Sealants

EMSL analyzes coatings, adhesives and sealants to find scientific answers to clients’ difficult questions. This often involves identifying the root cause of product failures by analyzing its components and formulation.

For coatings this may include identifying:
- If a coating contains dangerous pigments
- If a coating matches others
- If a supplier is providing the correct paint or coating
- If enough coating was applied
- Why a coating is bubbling and pulling loose
- Why a powder coat peels

Adhesives and sealants may require analytical services to determine:
- Contamination Issues
- Curing Properties
- Deformation
- Material Selection
- Physical Changes
- Deformulation

Minerals and Oxides

Minerals and oxides are used for industrial applications, as raw materials and key components of finished goods. Understanding how these materials will react in various environments and under different conditions is often critical for companies that depend on various minerals and oxides to perform as desired.

EMSL offers extensive mineral and oxide testing services. Depending on the necessary analysis, EMSL’s experienced scientists may utilize:
- Energy Dispersive X-Ray Analyzer (EDX)
- ICP-Mass Spectrometer (ICP-MS)
- Inductively Coupled Plasma-Atomic Emission Spectrometer (ICP-AES)
- LECO Combustion Analyzer
- Near-Infrared Spectrometry (NIR)
- Optical Microscopes
- Scanning Electron Microscopes (SEM)
- Transmission Electron Microscopy (TEM)
- Wavelength-Dispersive X-Ray Fluorescence Spectrometer (WD-XRF)
- X-Ray Diffractometer (XRD)

Semiconductor and Micro-Electrical Devices

Semiconductors and micro-electrical devices are a modern component of everyday life. As they continue to decrease in size and increase in complexity, testing these products has become more complex and challenging.

These products are often subject to rigorous testing to ensure they work properly and can withstand normal wear and tear. EMSL’s scientists offer a wide range of testing services to this industry. Services range from metallurgical testing to adhesive and coating analytical services.
Combustible Dust Testing

In response to ongoing industrial / agricultural accidents related to the ignition of combustible dusts, OSHA has issued Directive #: CPL 03-00-008, Subject: Combustible Dust National Emphasis Program. The purpose of this program is to inspect facilities that generate or handle combustible dusts and make recommendations to the inspected parties that will reduce the risk of fire hazard which could result in bodily injury, loss of life and property damage. Combustible dusts are often either organic or metal dusts that are finely ground into very small particles, fibers, fines, chips, chunks, flakes, or a small mixture of these. Types of dusts include, but are not limited to: metal dust, such as aluminum and magnesium; wood dust; plastic dust; biosolids; organic dust, such as sugar, paper, soap, and dried blood; and dusts from certain textiles. Some industries that handle combustible dusts include: agriculture, chemicals, textiles, forest and furniture products, wastewater treatment, metal processing, paper products, pharmaceuticals, and recycling operations (metal, paper, and plastic). Therefore, the directive covers a wide range of materials used in many application areas across almost all the major industrial and agricultural sectors.

The testing package includes:
- Maximum normalized rate of pressure rise (dP/dt) – Kst Test - ASTM E1226
- Minimum explosive concentration (MEC-ASTM E1515)
- Minimum ignition energy (MIE - ASTM E2019)
- Minimum ignition temperature (MIT – ASTM E 1491)
- Class II test
- Percent combustible dust
- Percent combustible material
- Percent moisture content
- Percent through 40 mesh
- Resistivity (for metal powders)

Litigation Support

EMSL provides litigation support through scientific expertise and cutting edge analysis. With a diverse group of the industry’s leading scientists, EMSL is capable of providing analysis to support litigation, provide comprehensive reports and expert witness testimony.

No matter whether the case involves intellectual property, patent infringement, trade disputes or other types of litigation, EMSL can help.
Consulting Services

Staffed with close to 500 scientists and laboratory personnel, EMSL offers consulting services on a wide range of topics. Commercial, institutional, governmental and private individuals from around the globe rely on EMSL for fast and accurate answers to their scientific questions.

The company is staffed with a number of the industries’ leading scientists who regularly consult with clients with questions about testing for:

- DNA Identification
- Chemicals
- Consumer Products
- Food Products
- Industrial Materials
- Microbiologicals
- Metals
- Pharmaceuticals
- Physical Properties
- Radiological Services
- Raw Materials
- Toxins
- And more…

Quality Assurance

Scientifically and legally defensible data is what it’s all about. EMSL’s laboratories have a wide range of accreditations and participate in numerous proficiency programs. These proficiencies, accreditations and certifications ensure that the laboratories meet the highest standard of quality and can deliver reliable, consistent results every time.

EMSL maintains strict adherence to our Quality Assurance/Quality Control programs and regulatory requirements which comply with ISO 17025, FDA, AOAC, GMP, ASTM, EU, AIHA and NVLAP guidelines and methods.

Reporting Results

EMSL’s company-wide focus on customer service makes no project too large or too small. The corporate research and development capabilities allow EMSL to bring new methodologies online quickly to meet new industry challenges and client needs. EMSL is committed to providing reliable, defensible data in a standardized and user-friendly format. Rapid turnaround and competitive prices make the dependable results that much more valuable.

People

EMSL’s dedicated staff includes Ph.D. scientists with substantial industry and academic credentials, and professionals with many years of experience in materials-related testing services. Areas of expertise include: petrography, steels and high-temperature refractory alloys, metals and ceramics processing, mechanical behavior of materials, materials selection and evaluation, single crystals, nano-structures, microelectronic materials, and processing and characterization of coatings and thin films, polymers chemistry, deformation, food chemistry, forensics, failure analysis, combustible dust and FDA detains, to name a few.
Case Studies

Case: Manufactured Ice Cream Scoops

Background: A manufacturer of ice cream scoops found white powder within sealed bags containing their product.

Findings: The ice cream scoops were found to be made of un-coated aluminum. Once placed within individually sealed packages moisture resulted in oxidation of the metal and formation of aluminum oxide, which is a white powder. Subsequent analysis on several variations of their product, including anodized and polymeric coatings resulted in similar oxide formation. Even repeated cycles of cleaning using a standard home dishwasher resulted in oxide formation. The analysis, which included microscopy, Energy Dispersive X-Ray Spectrometry and X-Ray Diffraction Spectrometry resulted in the conclusion to buy stainless steel and leave aluminum out of the kitchen.

Case: Failure of Automotive Brackets

Background: Metal brackets used on certain automobiles were breaking. This could result in a potentially dangerous outcome if the vehicle is in operation at the time of failure.

Findings: Physical testing of the brackets revealed that they had a tendency to break at forces below the intended limit by both Tensile and Flexural analysis. Further testing by microscopy was employed on cross-sectioned pieces of the fractured parts. The result of testing indicated that the parts were of inferior quality. Instead of high grade steel the parts were made from standard steel and coated with chrome. In addition, the steel used was found to have microscopic air voids within the metal. The part, which was made in China, was inferior to that specified by the engineer.

Photo of a broken bracket showing the direction of failure.

SEM 2,500X image showing air voids within the cross-sectioned metal used to make the bracket.

EDX spectrum showing the elemental composition of the white powder collected on two of the scoops.

Cross-section of the metal showing non-uniform grain structure.

Cross-section of the metal bracket showing micro-fracturing that occurred during the failure.
Case Studies

Case: Shots Fired at an Elementary School

Background: Bullets were fired at an elementary school. The projectiles penetrated the exterior walls and were acquired from within the building. The focus of the investigation was to determine the type of rounds used, make of the projectile(s) and match it to reference ammunition from a local rifle range.

Findings: The analysis was performed by various microscopy techniques that enabled measurements of the rounds and characterization of the projectiles and their coatings. Law enforcement utilizes this information in their efforts to trace the ammunition to a suspect. The spent rounds were found to be consistent with .177 air rifle pellets and .22 caliber rounds. Further investigation matched the .22 caliber rounds to those found at a local rifle range.

Case: Light Transmission Through Specialty Glass

Background: A manufacturer of specialty glass containers needed to verify the effectiveness of coatings used to limit the transmission of light. The containers are used for holding light-sensitive liquids.

Findings: Analysis was performed using transmission spectrometry. Wavelengths from 300nm to 2500nm were tested over several lots of bottles. The data determined that two of the lots were outside of the tolerance limits and could result in premature deterioration of the contents.
Facility and Equipment

Supported by a broad array of instrumentation, LA Testing applies a full spectrum of standard and customized analyses for elemental and chemical, structural, particle, surface, contaminant, mechanical, failure, bio-effectiveness and other types of projects. The parent company’s headquarters is located in Cinnaminson, New Jersey in a 125,000 square foot state of the art testing laboratory. In house instrumentation includes:

- Acoustic Digital Tap Hammer
- Anodic Stripping Voltammetry (ASV)
- Ascott Cyclic Corrosion Test Chamber
- Auger Electron Spectroscope (AES)
- Oxygen Bomb Calorimeter
- Carbon, Nitrogen, Sulfur, Hydrogen Analyzers (combustion)
- Cold Vapor Atomic Absorption Mercury Analyzer (CVAA)
- Cold Vapor Atomic Fluorescence Mercury Analyzer (CVAF)
- Combustible Dust Chamber (20 L Siwek)
- Combustible Dust – Mike 3 Test Apparatus/Min. Ignition Temp.
- Corrosion Chamber
- Cryo-Microtome
- Dielectric Breakdown Testing Equipment
- Differential Scanning Calorimeter (DSC)
- Environmental Chambers (various conditions)
- Flame Atomic Absorption (FAA)
- Fourier Transform Infrared Microscope (micro-FTIR)
- Gas Chromatographs (GC, ECD, FID, MS, MS/MS, NPD, High Resolution, Pyrolysis)
- Glow Discharge Optical Emission Spectrometer (Pulsed Matched RF GD-OES)
- Gel Permeation Chromatography (GPC)
- Graphite Furnace Atomic Absorption (GFAA)
- Heat-treating Furnaces (RT to 1700°C)
- High Performance Liquid Chromatography (HPLC)
- /Diode Array/Fluorescence Detectors
- High Performance Liquid Chromatography coupled with ICP-MS
- High Speed Video Camera
- Impedance Analyzer
- Inductively Coupled Plasma Spectrometer (ICP)
- Inductively Coupled Plasma Spectrometer/Mass Spectroscopy (ICP/MS)
- Impact Tester
- Torsion Test System
- Ion Chromatography (IC)
- Liquid chromatography–mass spectrometry (LC-MS)
- Liquid chromatography-quadrupole mass spectrometer (LC-MS/MS)
- Magnaflux AC/DC Magnetic Particle Inspection System
- Magnetic Properties Testing Equipment
- Mercury Analyzer
- Optical Emission Spectroscopy (OES)
- Surface Roughness Tester
- Servo-hydraulic Fatigue Test System
- Near Infrared Spectroscope (NIR)
- Nuclear Magnetic Resonance (NMR) Spectroscopy
- Osmolality Equipment
- Oxygen Transmission Rate Analyzer
- Particle Sizer (High Performance/Laser Interferometry
- Phase Contrast Microscopes (PCM)
- Polarized Light Microscopes (PLM)
- Precision Ion Polishing System (PIPS)
- Scanning Electron Microscopes/Energy Dispersive X-Ray Analyzers (EDXA)
- Surface Area/Chemisorption Analyzer (BET, pore size)
- Tabor and Linear Abrasion Equipment
- Thermal decomposition/Amalgamation and Atomic Absorption Solid State Mercury Analyzer Thermogravimetric Analyzer (TGA)
- Total Organic Carbon Analyzers (TOC)
- Transmission Electron Microscopes/Energy Dispersive X-Ray Analyzers (EDXA)
- Ultrasonic Flaw detector
- Water Transmission Rate Analyzer Micro-indentation Hardness Tester
- Regular and Superficial Rockwell Hardness Tester
- X-Ray Diffractometers (XRD)
- X-ray Fluorescence Spectrometer (WD-XRF)
- Zeta Potential Analyzer
Laboratory Services Include:
Asbestos, Mold, Bacteria, Metals, Industrial Hygiene,
Environmental Chemistry, Radiological Chemistry,
Microbiology, Consumer Products, Allergens, Toxins,
PCR-Polymerase Chain Reaction (DNA), Silica, Water,
Industrial Materials, Volatiles Scan, Indoor Air Quality,
Formaldehyde by HPLC, Food Microbiology, Forensics,
Pharmaceuticals, Nutraceuticals and Radon.