
intertek
Total Quality. Assured.
ALLENTOWN, PA
CHEMICALS &
MATERIALS
SERVICES
Comprehensive Solutions for Testing and Analysis
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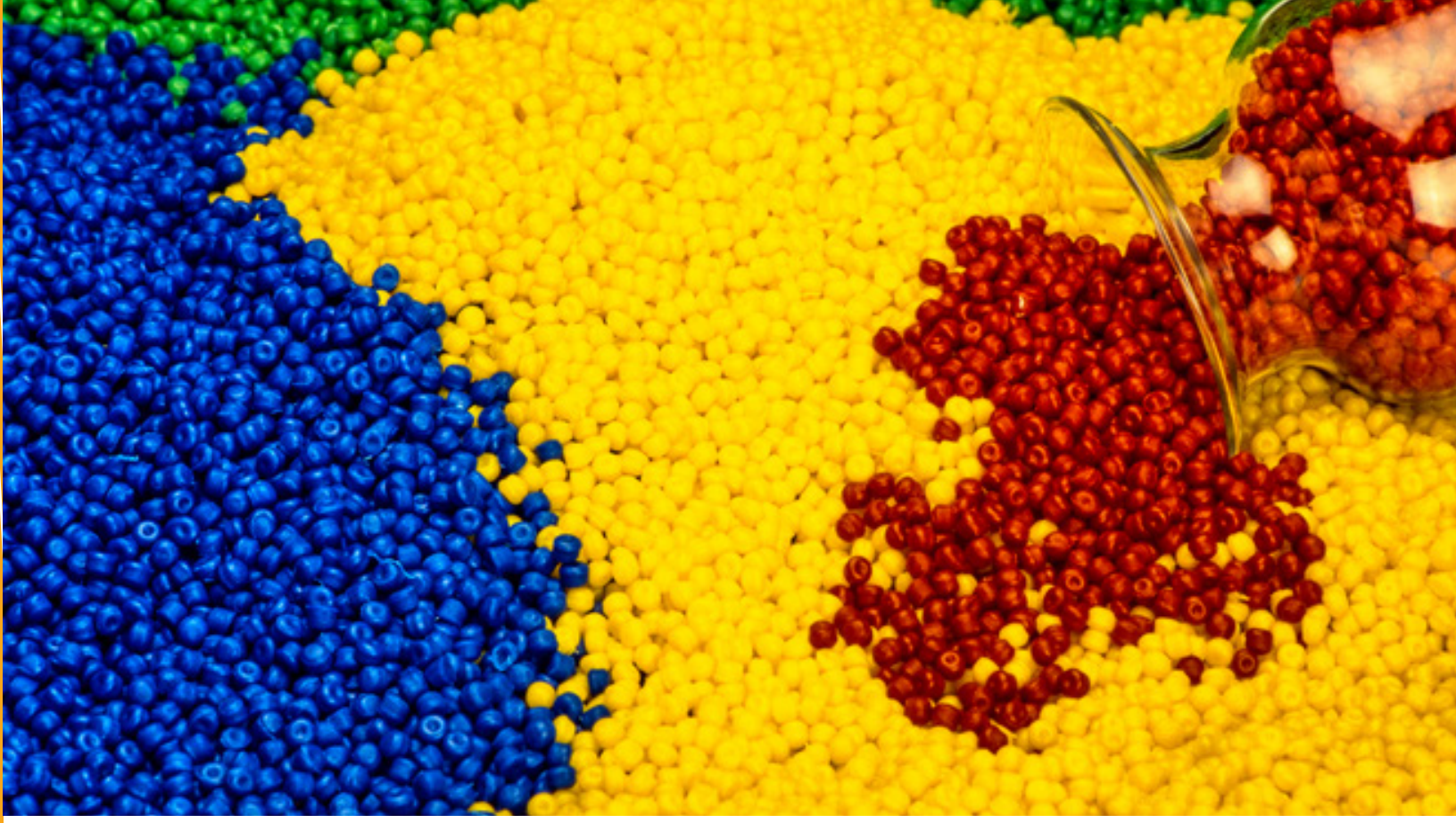
Our chemicals and materials testing and analysis solutions

Intertek Allentown is an ISO 17025-accredited laboratory that provides world-class expertise to support customer needs. Our chemicals and materials testing and analysis solutions, experience, and state-of-the-art technology make us a single-source solution for basic and complex chemical problems.

We work with customers around the world. As part of the global Intertek laboratory network, our lab can access additional world-class expertise and resources to support customer needs.



Our scientists have decades of industry experience supporting customer research, development and production projects, manufacturing, consulting and quality control. Our customers benefit from the many years of experience of our team of skilled professionals who are committed to providing innovative solutions, integrated problem-solving, and all-encompassing customer service.

Our chemicals and materials analytical capabilities and solutions help customers improve and enhance discovery, prototype, scale-up, trouble-shooting and process monitoring activities. We stay on the cutting edge by developing new methods for emerging needs, and customized measurement approaches for each environment.

Testing and Analysis

Intertek Allentown offers many testing and analysis services, including characterization and analysis of polymers, surfaces, residues, and volatiles; quantitative and qualitative analyses of surfaces, interfaces, and bulk materials; and development of the structure-property relationships critical for product improvement.

Chemical Composition Analysis

Chemical composition analysis can require the application of a combination of analytical methods to achieve a full picture of the chemical structures and concentrations of the components in a sample. To aid product development, the concentration of specific components—such as an active ingredient that imparts a unique function to the product— should be determined to understand the product's performance or quality.

Accurate analysis of the chemical composition of a material will provide invaluable information, assisting chemical problem solving, supporting research and development, and ensuring the quality of a chemical formulation or product.

Our chemical composition services include:

- Chemical trace analysis
- Organic chemical structure elucidation
- Elemental trace analysis
- Crystalline material structure elucidation
- Materials analysis
- Reverse engineering and formulation
- Surface analysis
- Failure analysis

Deformulation and Unknowns Identification

Deformulation or reverse engineering of a chemical formulation provides specific information about the composition of formulated products and how the components interact. Deformulation helps determine which chemicals, substances or materials are incorporated into a product. This may include designing a new product since complex product formulations can contain dozens of components of varying chemical nature.

Comprehensive solutions for chemicals & materials

Our experts provide comprehensive analysis of formulated chemical products to separate, identify, and quantify each ingredient.

We offer deformulation services for a variety of materials, including:

- Coatings
- Polymer additives
- Plastics
- Specialty chemicals
- Adhesives
- Catalysts
- Surfactants

Volatile Organic Compound (VOC) Testing and Analysis

VOCs are present in all natural and synthetic materials. They can exist as structurally-diverse liquids, solids, or vapors. They are a significant airborne consideration when biomonitoring human exposure levels, analyzing odor issues, and in the interest of food contact, particularly the National Institute of Advanced Studies (NIAS).

The potential dangers associated with VOCs make them an important consideration when developing chemical products. We provide the ability to target specific VOCs of interest with high levels of sensitivity.

Our VOC services include:

- Identification of VOCs
- Testing and analysis of aqueous and non-aqueous mixtures
- Plastic and polymer VOC testing

Thermal Analysis and Testing

Thermal analysis provides valuable insight into how a material changes with temperature. We use thermal testing to evaluate adhesives, coatings, polymers, composites, laminates, plastics, pharmaceuticals and other materials. Thermal tests for the determination of endotherms, exotherms, phase transitions, weight loss on heating or cooling and dimension changes are performed for customer samples.

Our thermal analytical capabilities include:

- Glass transition temperature (Tg)
- Melting and freezing points
- Heat capacity (Cp)
- Thermal expansion coefficient
- Thermal stability
- Oxidative stability studies
- Calorimetry

Calorimetry is also used for thermal hazards testing. Intertek's experts can determine the thermodynamics of reactions and mixing.

The data can be used to figure out:

- Relief valve size
- Safety of reactions
- Pressure generation
- Exothermicity of reaction

Trace Metals Analysis

Our laboratories provide Total Quality Assurance through responsive trace metals analysis services, available to parts per million (ppm), parts per billion (ppb) and parts per trillion (ppt) detection levels. We deploy our expertise to adapt the methodology to the sample matrix and the nature of the analysis required. These trace and ultra-trace levels can change over time with the evolution of global regulatory demands for a range of industries calling for lower detection limits. Our experts monitor changes in legislation that impact your industry sector to ensure the most suitable approaches are deployed to reach the required limits.

Trace Level Identification

We offer the trace metals identification and quantitation of elements using Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES), Inductively Coupled Plasma Mass Spectroscopy (ICP/MS), and Atomic Absorption (AA). We can measure trace metals in a variety of materials and products with services that include:

- Rapid response troubleshooting
- Catalyst analysis
- Support for the mandatory Chemical Safety Assessment (CSA) for Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH)
- Identification of unknowns
- Raw material and supply chain characterization

We also offer comprehensive analysis of common metals, including heavy metals, such as mercury, cadmium, arsenic, lead, chromium and nickel.

Titrations and Wet Chemistry

We have the capability to identify chemical functional groups at trace levels in multiple materials and products, such as:

- Solutions
- Chemical mixtures
- Household products
- Raw materials

We can quantitate several different functional groups by titration, including hydrogen peroxide, amines and moisture.

Sorption Analysis

We perform sorption analysis to find out the characterization of adsorbents, catalysts, nanoparticles, and polymers with customized tests designed to suit your applications.

Using the interaction of gases/vapors with solids, we can analyze a range of samples, such as absorbent materials and catalysts, providing comprehensive data, including:

- Micropore surface area
- Micropore volume
- Adsorption pore size distribution
- Chemisorption
- Vapor uptake
- Permeation
- Total pore volume

Surface Science

Surface science measures microscopic features and microstructures to nano-scale dimensions. It also evaluates the properties of coatings, laminates and composite materials, identifying causes of coating defects, pin-holing, delamination, loss of adhesion, contamination, and other coating problems.

Solutions include:

- Elemental surface analysis
- Molecular surface analysis
- Chemical images
- Depth profiling

Our surface science laboratories provide analytical expertise to support research, forensics, troubleshooting, quality control and more.

Metallurgy and Failure Analysis

Intertek metallurgical expertise covers a wide range of applications utilizing state-of-the-art analysis, consulting, and on-site metallurgical investigations to meet challenging customer needs.

Metallurgy and failure analysis services include chemical, mechanical, micro/macro, destructive, and non-destructive testing for a range of metals and other materials.

The metallurgical and analytical laboratories offer expertise in:

- Fracture
- Creep
- Fatigue
- Wear
- Deformation
- Corrosion control
- Contamination (trace analysis)
- Failure mechanism and root cause
- Insight into corrective actions
- Materials evaluation and development

Rheology

Rheological testing offers insight as to how materials (both liquids and solids) respond to deformation over a range of temperatures and frequencies.

Understanding the rheological properties through laboratory testing can help optimize products and process conditions, thereby saving costs and minimizing potential waste.

The data gathered are useful in designing materials for a given application. Our rheological testing includes:

- Viscosity determination
- Dynamic Mechanical Analysis (DMA)
- Creep
- Stress relaxation
- Cure studies

Metallography

Metallography focuses on the science and art of preparing, interpreting, and analyzing microstructures to understand material behavior and performance.

Intertek's metallography lab provides physical, micro/macro destructive and non-destructive testing of materials, including steels, cast iron, stainless steels, tool steel, nickel alloys, copper and copper alloys, aluminum and aluminum alloys, titanium, magnesium, zinc alloys, ceramics, and plastics.

These services include:

- Dye/Liquid penetrant and magnetic particle Inspection
- Replication and field microscopy
- Mounting, polishing, chemical or electrolytic etching
- Stereo microscopy
- Light microscopy via a metallograph

Method Development for Emerging Needs

- Quantitative analysis, including:
  - Grain size
  - Length
  - Area
  - Inclusions
  - Carburization
  - Decarburization
  - Evaluating the microstructure of graphite in iron castings
- Digital image capture and processing
- Hardness/microhardness testing
- Ultrasonic thickness
- Hand-held X-ray fluorescence (XRF)
- Scanning Electron Microscopy / Energy Dispersive X-Ray Spectroscopy (SEM/EDS)

Failure Analysis/Industrial Forensics

Intertek's failure analysis and investigation services identify root causes of failures to improve future performance and solve problems.

We use our expertise to determine the root cause of cracks, catastrophic fracture, distortion or deformation, visual defects, corrosion, wear, or any malfunction or undesirable condition of the product. We also troubleshoot contamination issues.

Our services include:

- Fractography (visual, stereo and scanning electron microscopy)
- Non-destructive testing
- Material verification/characterization
- Processing and manufacturing verification
- Combination of customized analytical techniques

Failure analysis can offer benefits in several areas, including:

- Identification of failure mechanism(s)
- Determination of root cause – design deficiencies, material defects, manufacturing/ installation defects, or service life anomalies
- Prevention of future occurrences
- Warrantee claim support
- Litigation support

Additionally, we work to your unique requirements, whether you need a simple failure analysis or a comprehensive failure investigation that involves consultancy, investigation, and intensive laboratory work and a diverse range of expertise.

Method Development and State-of-the-Art Technology

In addition to adapting routine measurements for novel sample types, we stay on the cutting edge of technology by developing new methods for emerging needs, and customized measurement approaches for each environment.

Molecular Spectroscopy

Molecular spectroscopy analysis measures the spectrum response of molecules interacting with various frequencies and energy and provides identification and quantitation of molecules from a variety of materials. Molecules are analyzed by ultraviolet (UV), visible light (Vis) and infrared (IR) radiation spectrums, using advanced instrumentation available in the Intertek molecular spectroscopy laboratories.

We offer a variety of molecular spectroscopy analyses, including:

- Nuclear magnetic resonance (NMR) (liquids, solids)
- Fourier-transform infrared spectroscopy (FTIR)
- Raman microprobe
- Near infrared reflection (NIR)
- Fourier transform Raman spectrometry
- Ultraviolet–visible spectroscopy (UV-Vis)

Microscopy

Microscopy analysis is essential to gain an understanding of the microstructure or nanostructure of materials, chemicals, or products. Data from microscopy analysis is important to progressing research and product development programs, conducting failure analysis where a product or material has failed, or resolving contamination issues in manufacturing or other parts of the supply chain.

Our microscopy services include:

- Morphology
- Particle analysis
- Optical microscopy
- Scanning Electron Microscopy (SEM)
- Energy Dispersive X-Ray Spectroscopy (EDS)

Mass Spectrometry

Mass spectroscopy is used to detect and identify unknowns, mixtures, chemical structures, and more. It offers precise quantitative elemental analysis when combined with other instrumentation and provides detection down to ultra-trace levels.

Our mass spectrometry capabilities include:

- High resolution mass spectrometry (HR/MS)
- Gas chromatography mass spectrometry (GC/MS)
- Liquid chromatography mass spectrometry (LC/MS)
- Matrix-assisted laser desorption ionization (MALDI)
- Time-of-flight secondary ion mass spectrometry (ToF-SIMS)
- Thermal desorption GC/MS

Gas Chromatography

Intertek's gas chromatography (GC) labs provide analytical testing using gas chromatography detectors, including selective and highly sensitive detection of trace and molecular species-specific compounds. The range of GC detectors available, combined with expertise from senior laboratory staff, ensure quality service.

Our gas chromatography techniques include:

- GC/MS
- GC FID

- RGA for C1-C6 hydrocarbon analysis
- Specific GC detectors for extra sensitivity for species like S and N

Liquid Chromatography

Intertek provides liquid chromatography (LC) and separations laboratory capabilities for advanced and routine analysis. Liquid chromatography allows for selective and highly sensitive detection of trace and molecular species-specific compounds.

Our experts use various LC techniques to quantify solutions, products, and formulations using a variety of tools, including:

- High-performance liquid chromatography (HPLC)
- Ultra-Performance liquid chromatography (UPLC)
- LC/MS
- Ion chromatography (IC)

In addition, we have a wide range of size exclusion chromatography (SEC) instruments to measure polymer molecular weight distributions.

X-ray Diffraction (XRD)

Our expertise and capabilities in XRD analysis help identify crystalline compounds, relative concentration and structure, including atomic arrangement, crystallite size, and imperfections.

XRD provides:

- Analysis of solids, films, powders, and dispersions
- Grazing incidence diffraction
- Reflectometry of thin films

Intertek XRD analysis and expertise are available for a wide range of sample types and applications.

Additional Services

Technical Consulting

Intertek Allentown's consulting services range from short discussions to milestone-based program planning. Our scientists assist customers in addressing complex challenges, including:

- Regulatory analytical testing, such as REACH compliance, food contact, and premanufacturing notices (PMN)
- Restriction of Hazardous Substances (ROHS) compliance
- Restricted substances compliance
- Safety data sheets

Expert Testimony and Litigation Analytical Support Services

Intertek offers scientific and consulting support for your chemical safety litigation case. We have a wealth of scientific and consulting expertise and experience to support your legal professionals in launching the best possible case against claims of personal injury or class action litigation arising from perceived, potential, or actual exposures to chemicals. The combination of our world class analytical testing capabilities and our extensive database of toxicological reviews are an excellent resource for legal professionals.

We are experienced in the preparation and presentation of expert testimony for litigation cases involving industrial chemicals, pesticides, dietary supplements, medical devices, pulp and paper mill effluents, exposures to potentially harmful liquids and gases in the workplace, and chemicals in consumer products.

We can assist with a variety of litigation issues, including:

- Commercial liability
- Patent protection or infringement disputes
- Product performance or quality claims

Customized Testing

Since many issues our customers encounter are specific to their product or process, we offer customized testing designed specifically for their needs. Once a customized test or method has been developed, it can be offered on a regular basis to support product development or manufacturing. We can also arrange for repeat testing to methods that are not standard or are unavailable elsewhere.

Chemical and Material Testing for Sustainability

With a growing emphasis on environmental and human health impacts of materials and products, manufacturers, retailers, and suppliers are optimizing transparency, monitoring their chemical footprint and considering sustainability in design. Chemical and material analysis can be applied to a wide range of materials and products. These measurements can address an extensive scope of chemistry, formulation, and product strategies in nearly any market.

Some examples of different scopes are to detect, identify and quantify various chemicals of concern, such as:

- Toxic metals
- Substances of very high concern (SVHC)
- Volatile organic compound (VOC) content and emissions
- Environmental compounds of concern
- Formaldehyde (and other aldehydes)

Our chemical and material testing experts can develop custom analyses designed to identify specific chemicals of concern, supply chain issues, and proprietary products. Our team will work closely with you to both identify the question and determine the best measurement to obtain the needed data.

The Benefits

Choosing Intertek Allentown as your partner gives you access to a network of qualified professionals, risk management tools that allow you to control quality and quantity and ensure compliance with international standards from source to delivery.

We provide you with Total Quality Assurance offering traceability throughout your entire supply chain. By understanding local challenges, we apply global solutions to protect your interests in North America and the rest of the world.

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