

# The Ohio Lumex Laboratory Statement of Qualifications

Solutions to Complex Analytical Challenges



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## MISSION

Our Mission is to provide the highest quality, timely and most cost-effective analytical services to a wide range of industries, including:

- ▷ Utilities
- ▷ Cement Plants
- ▷ Chemical Manufacturing
- ▷ Refineries
- ▷ Natural Gas
- ▷ Waste to Energy/Biogas
- ▷ Environmental Sample Analysis
- ▷ Food & Beverage
- ▷ Materials Analysis and Others

The Ohio Lumex Laboratory is a NELAP accredited laboratory focused on three core areas - analysis of gases, liquids and solids, methods development, and consulting for industry. We are the premier laboratory worldwide for the analysis of mercury, combustion gas emissions, and gaseous fuels, including EPA Method 30B, EPA Performance Specification 12B, and EPA M7473 using direct mercury analysis via thermal decomposition. The Laboratory offers the fastest turnaround times in the industry with the highest quality, and goes beyond just analyzing and reporting of results by providing continual support and technical expertise.

- ▶ Analysis
  - ▷ Gases
  - ▷ Liquids
  - ▷ Solids
- ▶ Methods Development
- ▶ Consulting

National  
Environmental  
Laboratory  
Accreditation  
Program



## COMMITMENT TO QUALITY

The Ohio Lumex Laboratory follows strict policies and procedures both established by NELAP and developed internally to ensure high-quality data acquisition. Every analytical batch receives detailed attention from sample acceptance to final report delivery. A QA/QC manager reviews and assigns each project to specific instrument parameters for optimal results. Each set of data is independently reviewed to verify that all laboratory QC checks have passed and method requirements have been adhered to. Laboratory management is available to answer any questions you may have about your report.



## PRODUCT & SERVICE SUPPORT

The Ohio Lumex Laboratory routinely performs custom analysis and diagnostic services to help clients successfully use our products for both process control and regulatory compliance, including recommendations for modifying sampling parameters or sorbent trap configurations.



## SUMMARY OF LABORATORY SERVICES

The Ohio Lumex Laboratory takes pride in our adaptive and agile approach to solving difficult problems. Although the majority of our work pertains to Hg Sorbent Trap analysis, we have also invested a great deal of effort in the development of new products, methods, and services in response to our customers' needs. Ohio Lumex's reputation for quickly providing custom-tailored solutions has led to unique and challenging requests from many industries. Our laboratory researchers embrace these challenges, and have a long track record of successfully developing new analytical methodologies which have been applied across various industries.



### Mercury Analysis

#### ▷ 30B & Hg Speciation Traps

Our Laboratory routinely analyzes EPA Method 30B Total Hg & Speciation sorbent traps for Relative Accuracy Test Audits, 30B LEE compliance, mercury control technology optimization/verification, and other 30B applications. These sorbent traps are analyzed via thermal desorption atomic absorption spectrometry using Ohio Lumex M324 sorbent trap analyzers. Ohio Lumex also produces, spikes, and provides expert guidance on the use of these sorbent traps.

#### ▷ PS12B Traps

In addition to analysis of Method 30B sorbent traps, our laboratory also specializes in analysis of EPA Performance Specification 12B sorbent traps with extremely fast turnaround times and unparalleled data quality. Our laboratory spikes, customizes, and provides source specific recommendations and troubleshooting support of these sorbent traps.



#### ▷ Gold Traps

Gold sorbent traps are primarily used for mercury measurements in natural gas using ASTM D5954. These low-level measurements are not amenable to the use of carbon-based sorbent traps which are biased by the presence of organic interferents.

#### ▷ Gas Cylinders

Certain measurement applications may make it impractical or infeasible to sample using sorbent traps. For these applications, a high-pressure gas cylinder filled with the sample gas may be sent to our laboratory for sample processing and analysis via ASTM D5954.

#### ▷ Miscellaneous Solids

Our Laboratory follows EPA Method 7473 for analysis of solid materials via thermal desorption atomic absorption spectrometry. The types of solid samples our laboratory frequently analyzes for mercury content includes coal, fly ash, soil, sand, limestone, filter materials, and a variety of other materials.

#### ▷ Liquids Analysis

Our Laboratory follows EPA Method 245.1 for sub-ppb mercury measurements.

#### ▷ Reagent & Sorbent Testing

The Ohio Lumex Laboratory has constructed an entrained flow reactor for the purpose of evaluating Hg adsorbents (activated carbons, etc.). Elemental Hg calibration gas is supplied to the reactor while the subject material is slowly added to the reactor. Real-time measurements of Hg concentration are obtained via an Ohio Lumex IRM-915+ monitor. Adsorbent characteristics of the subject material are evaluated by comparing Hg concentration during baseline with concentration during material injection.

## HCl/HBr Trap Analysis

### ▷ HCl Analysis

Our Laboratory follows EPA OTM-40 for analysis of hydrogen chloride sorbent traps. Sorbent Traps are analyzed via ion chromatography. These sorbent traps are typically used for measurement of HCl content in coal-fired flue gas prior to a Method 26 or Method 26A compliance test. OTM-40 can also be used in lieu of Method 26 for compliance purposes, following the guidelines described in Alternative Test Method 129.

### ▷ HBr Analysis

The sorbent traps used for capture and analysis of HCl can also be used for measurement of hydrogen bromide (HBr). These measurements are typically performed for engineering tests around Air Pollution Control Devices (APCDs). This measurement has been useful for testing native and artificial hydrogen bromide concentrations for the purpose of mercury oxidation.

## SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> Analysis

SO<sub>3</sub> Sorbent Traps are typically used in lieu of Method 8/8A/CTM-013 for engineering studies and process analysis, especially in cases where Method 8 is too difficult to perform at the sampling site. Common applications include measurement of H<sub>2</sub>SO<sub>4</sub> emissions from coal-fired power plant stacks, as well as testing of SO<sub>2</sub> → SO<sub>3</sub> conversion across an SCR module or other catalyst. These traps are analyzed via ion chromatography.

The laboratory can also perform analysis for Method 8/8A/CTM-013 using either ion chromatography or barium-thorin titration as requested.

## As/Se Analysis

### ▷ Arsenic Analysis

These sorbent traps are analyzed via hydride generation atomic fluorescence spectrometry (HGAFS) or graphite furnace atomic absorption spectrometry (GFAAS). Their common application is the evaluation of limestone combustion or injection and its effects in arsenic mitigation for the purpose of preventing catalyst poisoning.

### ▷ Selenium Analysis

Our arsenic sorbent traps are also used for the capture and analysis of selenium, using the same analytical methods. Selenium measurements are typically of interest to utilities affected by EPA's Effluent Limitations Guidelines (ELG), since the traps can be used to evaluate selenium control technologies in the gas phase, prior to selenium capture in the FGD.

## NH<sub>3</sub> Analysis

Ammonia sorbent traps are used to measure ammonia slip after SCRs, as well as ammonia concentrations between SCR layers. These sorbent traps are analyzed via ion chromatography.

## Method 26 Analysis

Our laboratory analyzes Method 26 and 26A samples for HCl, HBr, Cl<sub>2</sub>, and Br<sub>2</sub>.

## Siloxanes Analysis

The Ohio Lumex Laboratory has taken a leadership position in the development of methods for sampling and analysis of Siloxanes in Biogas. The complex and varying gas matrices from wastewater treatment plants to landfills make Siloxanes difficult and expensive to measure.



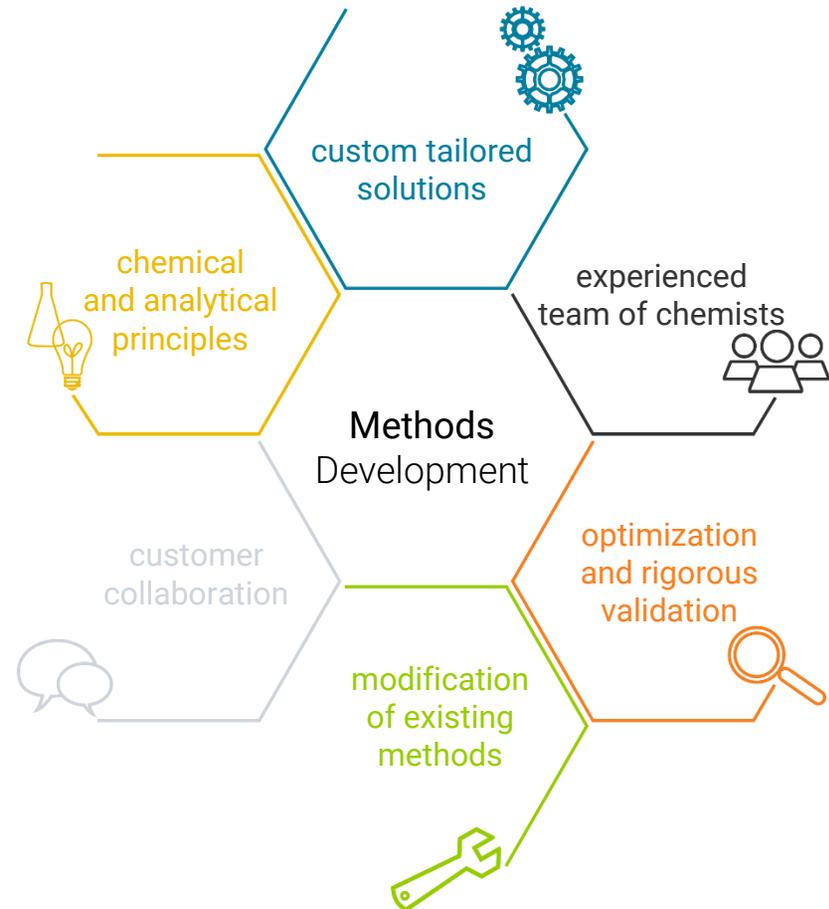
## Field Capabilities

When near real-time results are required, the laboratory routinely deploys its analysts and capable instrumentation into the field.



## Methods Development Services

Our chemists go beyond simply knowing how to perform methods by having a deep understanding of chemical and analytical principles which allows the laboratory to develop methods. We created several in-house methods “from scratch” and also modified existing methods which were optimized for specific applications. The laboratory uses technical expertise to modify instrument parameters and components to measure analytes in difficult sample matrices or at extremely low or high concentrations.





The Ohio Lumex Laboratory provides consulting and support services in three main areas – Optimization Services, Testing Services, and Training and Support Services. The process begins with an initial consultation to discuss the client’s specific needs and concerns, followed by a brief report identifying the pertinent issues and preliminary recommendations. Additional steps may include reviewing existing data, developing a testing program if additional information is required, and training for plant personnel.

- ▶ Optimization Services
- ▶ Testing Services
- ▶ Training & Support Services

The Laboratory will draw on other Ohio Lumex departments, including Engineering, Research & Development, Service, and Field Services, and a team of industry experts, to best serve the specific needs of its clients. Our support team includes individuals who have expertise in a wide range of fields, including plant management, process and chemical engineering, control technologies, risk management, regulatory and compliance, and monitoring and analysis.



## A DEDICATED TEAM OF EXPERTS

We have a highly educated, experienced and customer-focused staff dedicated to serving you. Our senior management team provides leadership and direction to our seasoned staff.



**Anthony Schneider**  
M.Sc. in Chemistry

Director of Lab Services  
Ohio Lumex Company, Ohio

Anthony has a strong educational background in chemistry. During his years at Ohio Lumex, Anthony has taken on a wide range of responsibilities. Prior to assuming the role of laboratory director, he spent significant time as a field technician and environmental chemist with a focus on method development. He manages several skilled laboratory analysts employed at the Ohio Lumex Analytical Laboratory and also enjoys providing technical support for clients.



**Joseph Siperstein**  
M. Sc. in Physical Chemistry

President and CEO  
Ohio Lumex Company, Ohio

Joseph is a chemist, and founder of Ohio Lumex. He has over 35 years of experience in applications related to chemical engineering, design and operation of chemical processes, continuous emissions monitors (CEMs), and analytical instruments, as well as research related to mercury measurement in gas, liquid, and solid media. He is the President of Ohio Lumex Company and has been in the mercury analysis field for over 20 years. He is also the designer of the Ohio Lumex M324 Sorbent Trap Analyzer System and worked with the EPA to validate the Hg sorbent trap methods used today. He continues to facilitate research into new methods and analyzers for alternative testing methods and applications.



**Jonathan Cross**  
M.A. Physics

QA/QC Manager, Research Scientist  
Ohio Lumex Company, Ohio

Jonathan ensures the Ohio Lumex laboratory maintains compliance with NELAP standards and the company's internal quality system. He often provides technical support for customers using sorbent traps for compliance or engineering studies and has spent 7 years managing field projects for a variety of applications across the country. Jonathan has coordinated various research and development efforts for the creation of new product lines and analytical methods and has secured support from government research grant programs. He is the author of many Ohio Lumex procedures, including those for sampling and analysis.



**Shawn Wood**

Director of Compliance Technology  
Ohio Lumex Company, North Carolina

Shawn brings a wealth of knowledge and experience to the table in regards to mercury species in stack gases and sorbent trap sampling. Before coming to Ohio Lumex, Mr. Wood was Director of Engineering & General Manager at Apex Instruments for over 7 years, where he was responsible for product development of sorbent trap sampling systems. He has also spent more than 14 years testing at over 280 sources, ranging from power plants to cement plants and DOD chemical weapons incineration facilities. Over 90% of all this testing was conducted using Ohio Lumex sorbent traps.

# Behind the Ohio Lumex Lab

This is who makes it all happen. Our experienced team of chemists turns your unique samples into quality data every time.



To learn more about the Ohio Lumex Lab, visit [ohiolumex.com/lab](http://ohiolumex.com/lab)

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[ohiolumex.com](http://ohiolumex.com)

