

Customer Analytical Services Laboratory (CASL)

CAPABILITY PROFILE



The power of precise information: helping our customers' make enlightened reliability and quality process decisions

The Customer Analytical Services Laboratory (CASL), in Tomball, Texas is the analytical testing group supporting our field team. Its primary mission is to provide timely, quality analytical data to meet our customers' needs. The laboratory is dedicated to maintaining the highest quality analytical services for your industrial water and process treatments.

These services include the analysis of water and process fluids for scaling species and corrosion by-products, metallurgical analysis of failed metal specimens, corrosion coupon testing, fuel oil analyses, and characterization of scale and corrosion deposits (inorganic, organic, and microbiological).

Our customers make daily technical decisions concerning capital equipment, process operations, and environmental situations based on laboratory data. Our laboratory is committed to producing accurate and precise data to ensure you take the best decisions as quickly as needed.

It is our philosophy at Veolia to provide value-added services to address your business needs. Although there are costs associated with producing quality lab results, we know that the return comes in satisfied customers and supporting their long-term operation.

To accomplish these goals, only procedures that have been tested and approved for the intended purpose are used. The appropriate standards are evaluated to ensure that the method stays within statistical control, and a continuous audit program ensures that all procedures are rigorously followed.

Capabilities

The Veolia Customer Analytical Services Laboratory offers a comprehensive array of industrial, analytical services designed for your business needs. All testing and methods comply with rigorous QA/QC protocols for method and results validation.

Quality Assurance and Quality Control Programs

The Customer Analytical Services Laboratory Quality Assurance Group and Quality Control programs are strongly supported by Veolia. Our program has three aspects: Method Documentation and Validation, Method Performance Monitoring, and Analysis Verification.

Method Documentation and Validation

Analytical methods used at CASL are designed for the matrices typically analyzed for customers. We identify three levels of method validation based on the frequency of samples analyzed. Level 1 are high-frequency standard analyses and require full documentation and statistical validation. Statistical validation includes the applicable concentration range, detection limit, quantitation level, linearity, precision, and accuracy statements. Level 2 and 3 methods require progressively less statistical validation due to lower frequency or nature of the test. Method documentation can also include scope, potential interference, and sampling guidelines.

Method Performance Monitoring

We have three programs to continually monitor method performance:

- Continuing Calibration Verification analyzes independently prepared standards for every ten to fifteen samples. Analytical results are not accepted if they are not performed alongside quality assurance (QA) check standards. Sample batches of less than ten samples must also have a beginning and ending QA check standard. All acceptable QA check standard results are stored and reviewed at least monthly to identify trends that should be addressed. Analysts have access to these data and can review QA charts at a higher frequency. All Level 1 methods follow these requirements.

- Blind Analysis Recheck Program randomly selects previously analyzed samples for re-analysis. These are blind-tested, and results are sent directly to the QA group. Data that differ significantly from the initial result are reviewed with the analyst to determine the cause.
- Analysis Verification: All analyses are reviewed before results are made available. These include cation and anion balance, measured vs. theoretical conductivity, basic water chemistry consistency (i.e. total metals greater than or equal to soluble metals), and comparison to historical values.

List of Equipment

Water Analysis

- Inductively Coupled Plasma (ICP)
- Atomic Absorption (AA)
- Mercury analyzer
- AquaKem Discreet Analyzer
- Segmented flow analyzers
- Ion Chromatograph (IC)
- Total Organic Carbon (TOC)
- Titration system
- UV/Vis spectrometer
- Flow injection analysis – automated conductivity determination
- Ion specific electrode (ISE)
- Particle Size Analyzer (PSA)
- Gas chromatography (GC)

Deposit/Microbiological Analysis

- X-ray fluorescence (XRF)
- X-ray diffraction (XRD)
- Thermogravimetric analyzers (TGA)
- Scanning electron microscopy (SEM)
- Automated extraction system for solvent extraction (ASE)
- Microscopes with imaging systems
- Fourier transform infrared spectrometer (FTIR)
- Elemental analyzer (CHNS)

Advanced Analytical Analysis

- Gas chromatography (GC)
- Liquid chromatography (LC)
- Mass spectrometry (MS)
- Head-space GC
- Pyrolysis GC
- ASE Solvent extractor (ASE)
- Electron spin resonance (ESR)

Case Study: Strategic lab analyses saves steel mill over \$130,000

The cooling tower at a large steel manufacturing complex was suffering a severe foaming episode. A rapid preliminary test provided by Veolia Analytical Laboratory indicated the source of the foaming to be oil-based. As the cooling system was comprised of over 20 heat exchangers that could all be the source of an oil leak, inspections and repairs would have taken months. In the meantime, cooling tower cycles had to be reduced to prevent excessive foaming and system fouling, but this implied increased water and chemical consumption.

Veolia's lab was provided with a series of samples from each potential oil source to match with the leaked oil in the water system. Based on detailed oil analysis, two exchangers were determined to be the potential source. Those were both taken out of operation for repair rapidly, and the oil contamination was immediately resolved afterward. The maintenance saved through this analytical service, as well as the savings in water and chemicals following a rapid return to normal cooling tower operation was evaluated at over \$130,000.

Oil Analysis

- Titration system
- Single element XRF (Chlorine & Sulfur)
- D86 analyzer
- Flash point analyzer
- Micro carbon residue apparatus
- FTIR
- UV-VIS
- Centrifuge
- Viscometer

Metallurgical Failure

- Analysis/Deposit Weight Density
- Struers Metallurgical Mounting Prep System
- Struers Rotopol-2 Automatic Grinder/Polisher
- Olympus Metallurgical Microscope
- Marvel Band Saw with 5 ton work surface capacity
- Crack / Flaw Detection
- Magnaflux System
- Leco Microhardness