

CUSTOMER ANALYTICAL SERVICES

Analytical Capabilities for Pulp and Paper Customers



For nearly 100 years, Solenis has helped pulp and paper mills all over the world optimize performance and efficiency with a wide array of innovative specialty chemicals and monitoring and control equipment. Our customers rely on our deep expertise, our on-site management approach, and our seasoned team of application experts and research scientists to remain competitive in increasingly challenging environments. The Customer Applications Laboratories, which include Customer Analytical Services, serve as hubs of our application expertise, ensuring that Solenis is prepared to meet the needs of our customers today and into the future.

Comprehensive analytical services. Global reach.

As a key element of Solenis' Customer Applications Laboratories, the Customer Analytical Services (CAS) group works closely with our sales, application, and research teams to understand pulp and paper mill systems and problems, as well as assist in the development of new treatment technologies. With laboratories located in Wilmington, Delaware; Paulínia, Brazil; Krefeld, Germany; Barendrecht, the Netherlands; Drammen, Norway; Terrassa, Spain; and Shanghai, China, we are dedicated to meeting the needs of customers in every region of the world. Solenis CAS labs are staffed with experienced scientists and technicians, who use an extensive array of analytical instrumentation to deliver the most accurate, relevant, and timely results. Solenis' laboratories can provide comprehensive analysis of inorganic, metallurgical, microbiological, and organic samples.



Liquor and Pulp Analysis

From recaust audit support to pulp quality metrics, the Solenis CAS laboratory provides a variety of inorganic and organic analysis to the pulping industry. The techniques used include:

- Ion Chromatography (IC) for anions
- Inductively Coupled Plasma spectroscopy (ICP) for elemental analysis
- Pyrolysis Gas Chromatography/Mass Spectrometry (GC/MS) for organic identification
- Solvent extraction with Fourier Transform Infrared (FTIR) Spectroscopy for organic identification
- Crude tall oil analysis

- Carbon analyzer for organic and inorganic carbon content
- Automated titrators for alkalinity, pH, and conductivity values
- Phase-Contrast Optical Microscopy with staining for detecting pitch
- Gas Chromatography with Flame Ionization Detector (GC-FID) detector for quantification of wood resin groups

Microbiological Analysis

The Solenis CAS laboratory performs problem-solving analysis to identify sources of microbial contamination in all aspects of the papermaking process. Analysis methods include:

- Microscopic examination of deposits and paper defects using a variety of staining techniques to identify bacteria, fungus, and higher biological life forms
- Standard anaerobic and aerobic bacteria/fungi counts on deposits, products, and fluid samples and DNA-based qPCR
- "Dairyman's Standard" bacterial testing/ISO 8784-1 on boards
- Bacterial spore counts
- Hemmhof test
- Biocide efficacy testing on process water
- Comprehensive wastewater testing and filamentous bacteria identification
- Preservative challenge studies on products



Pulp and Process Fluid Analysis

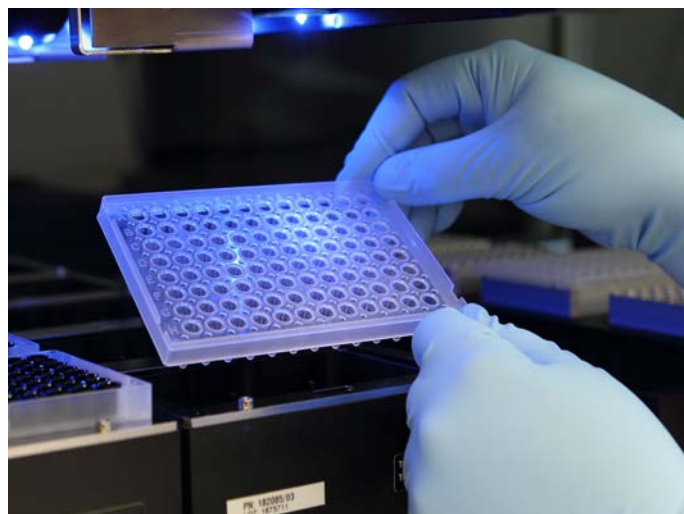
A thorough knowledge of water chemistry allows for anticipation and prevention of potential fouling, deposition, corrosion, and other problems. Some of the techniques used to understand these phenomena include:

- Gas Chromatography (GC) for volatile fatty acids and Liquid Chromatography for biocide residuals
- Automatic titrators for alkalinity, pH, and conductivity values as well as Total Organic Carbon (TOC) and Adsorbable Organohalogen (AOX) measurement
- IC and Capillary Electrophoresis (CE) for anions, including oxalate
- ICP for metals content
- UV-Vis Spectroscopy for soluble lignin content
- Solvent extraction with FTIR for organic identification

Deposit/Defect/Fabric/Board Analysis

Our scientists use advanced organic, inorganic, and microbiological analysis techniques to identify components of complex process and functional problems. Some techniques used include:

- Scanning Electron Microscopy (SEM) for mechanical and chemical damage, as well as degree of plugging
- Elemental analysis by ICP, X-Ray Fluorescence (XRF), and Scanning Electron Microscopy with Electron Dispersive X-Ray Spectroscopy (SEM/EDS)
- Optical microscopy for defect imaging
- Diamond Attenuated Total Reflectance (ATR) cell FTIR Spectroscopy, including Microspectroscopy for organic identification
- Pyrolysis GC/MS for organic and polymer identification
- Thermogravimetric Analysis (TGA) for ash content of small samples
- IC for starch analysis



Metallurgical Analysis

Our experts conduct failure analyses and general assessments of various metal components found in steam generation, heat exchangers, digesters, and paper and tissue machines. Some techniques used to analyze corrosion failure mechanisms include:

- Photographic documentation
- Dimensional analysis
- Microstructural evaluation
- Metal hardness testing
- Positive material identification
- Deposit weight density analysis
- Corrosion coupon analysis
- Electrochemical analysis methods

Real-world science. Rapid response.

The quality of communication between Solenis' CAS team and our customers is just as important as the quality of the science in supporting the production of pulp and paper mills. This is especially true when analytical testing reveals out-of-specification results. Seamless coordination between lab and field, supported by state-of-the-art systems and software, ensures timely transmission of analytical results to sales representatives for fast interpretation and problem-solving recommendations.



Solenis

Strong Bonds. Trusted Solutions.

Solenis supplies specialty chemicals for water-intensive industries, including the pulp and paper, oil and gas, chemical processing, mining, biorefining and power markets. Whether you want to increase production, develop new products, reduce costs or simply do more with less, we can help. With our innovative technologies, passionate people and unrivaled experience, Solenis is ready to deliver the solutions you need.

To learn more, contact your technical sales representative or visit us online.

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