

CORROSION MONITORING AND METALLURGY SERVICES

**Helping customers control corrosion costs and
limit environmental and safety hazards**



Water is the lifeblood of most industrial operations. It's also the focus and passion of Solenis. For nearly 100 years, our experts and research scientists have helped facility managers and engineers in water intensive industries manage and protect their capital assets with our wide array of specialty chemicals and monitoring and control equipment. The Customer Applications Laboratories, which include Corrosion Monitoring and Metallurgy 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.

Rapid identification of failure mechanisms to reduce production loss and downtime

Problems related to corrosion cost commercial and industrial plants billions of dollars each year. The biggest risks come from equipment failures, which can result in damage to capital assets, production loss and downtime, and safety and environmental hazards. Although a variety of means exist to inhibit corrosion, it's important to identify why corrosion occurs in the first place. The Corrosion Monitoring and Metallurgy Services group provides failure analysis and assessments of pulp mill, paper mill, tissue mill, steam-generating, and heat exchanger equipment. Working closely with customers, we provide clear identification of the problem parameters, which leads to more rapid and effective corrosion control and system reliability.



Failure Analysis

Our scientists use a number of techniques to identify high-temperature, corrosion, and stress-related failure mechanisms, including material (alloy) identification, microstructural examination, visual and microscopic inspection, physical dimensional analysis, metal hardness testing, deposit or corrosion product analysis and macro-photographic documentation. Pit depth measurements and wall thickness evaluations are also utilized to assess corrosion. We can also analyze deposit mass loading (deposit weight density) to assess the need for chemical cleaning of boilers. On-site inspection and formal presentation of failure investigation reports are available on an as-needed basis.

Corrosion Coupon Analysis

Corrosion test specimens of various metallurgies are provided for use by field sales and applications engineers to monitor conditions and product performance in customers' systems. Laboratory staff clean and weigh returned coupons to determine corrosion rates and provide photographic documentation of metal condition after system exposure. Pit depth studies and chemical analysis of surface deposits can be provided upon request for troubleshooting system and treatment performance.

Elemental and Compound Analysis

Elemental and compound analysis of thin-layered deposits and corrosion products at the metal interface can provide unique corrosion mechanism assessments. Also, direct access to in-



house microbiological, water and deposit analysis laboratories enables a rapid and complete profile of microbiologically influenced corrosion failures.

An integrated team backed by sophisticated technology

Effective corrosion control requires an integrated approach. Our field service representatives work closely with customers to identify the root cause(s) of equipment failures and to take effective and efficient corrective actions. More importantly, our field team collaborates with laboratory staff to make recommendations about how to prevent recurring equipment failures and plan for appropriate equipment replacement.



Preparing for the future needs of our customers

The mission of the Customer Applications Laboratories (CAL) team is two-fold: (1) utilize state-of-the-art chemical analysis techniques to understand our customers' systems and problems and (2) use that knowledge to assist in the development of new treatment technologies. This ensures that Solenis is prepared to address the future needs of our customers.

Real-world science. Rapid response.

The quality of communication between Solenis' CAL team and our customers is just as important as the quality of the science in supporting the efficiency of industrial operations. 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' Metallurgical Capabilities

APPARATUS	INFORMATION PROVIDED
Scanning Electron Microscope-Energy Dispersive X-ray Spectroscopy	Magnification of surface phenomena, elemental analysis of corrosion products and contaminants, alloy assay, elemental mapping
Metallograph	Magnified view of metal microstructures (up to 1000x)
Stereomicroscope	Macroscopic view of surface phenomena and failed components (up to 63x)
Hardness Tester	Macro hardness (Rockwell A, B, C scales)
Digital Camera System	Photographic documentation
Dial Indicator Gauges, Vernier Calipers, Micrometer	Pit depth analyses, wall thickness and estimated remaining life assessments
Cutting, Grinding, Polishing Tools	Preparation of samples for metallographic analysis



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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