

Water Treatment Solutions for **Municipalities** and **Drinking-Water Plants**





The Solenis Difference

In the last century, global water use has been growing at more than twice the rate of the population increase. An expanding number of localities — especially arid regions — are reaching the limit at which water services can be sustainably delivered. About four billion people, representing nearly two-thirds of the world population, experience severe water scarcity during at least one month of the year.

The objective to improve global water supply is a big challenge – not only in dry and rural regions but also in cities. Alternative methods for providing fresh water to the community, as well as sufficient industrial water and wastewater treatment, need to be found.

Solenis is active in 120 countries across five continents. As a global producer of water treatment chemicals, we combine firsthand experience with an innovative and

comprehensive product portfolio of flocculants, scaling inhibitors, defoamers and coagulants.

Through continuous growth and acquisition, Solenis has become a unique global specialty chemical company with a robust product portfolio. We also offer a wide range of customer-focused services that help our clients stay productive, profitable and compliant.

World-class **Products** and **People**

For over 50 years, Solenis has helped municipalities of all sizes manage their water and wastewater treatment challenges. We have a dedicated team of professionals who use their advanced expertise in water treatment processes and chemistries to develop and implement tailor-made solutions, which meet the highest economic and ecological standards. These experts are, in turn, supported by one of the industry's largest and most productive research and development organizations. Solenis scientists stay focused on delivering innovations today and are committed to developing new products for the future.

The following applications make up our core business:

- **Wastewater Treatment:** Our advanced and comprehensive product line for wastewater treatment helps customers in sludge dewatering and sludge thickening operations minimize sludge handling and disposal costs and improve plant performance. Solenis offers cost-effective solutions that deliver best-in-class business results.
- **Drinking Water Treatment:** Solenis has a wide range of flocculants and coagulants for use in drinking water plants. Our product portfolio is compliant with strict drinking water regulations.
- **Desalination:** Solenis is a leader in seawater desalination programs. We offer state-of-the-art coagulants and flocculants for seawater pretreatment, and a proven range of scale inhibitors and scale cleaners for both reverse osmosis and thermal desalination.



Product Portfolio

Solenis offers a full and innovative product portfolio to improve the performance of water treatment processes in municipal sewage plants and drinking water plants.

Flocculants

Solenis has a long history in solid/liquid separation with an established range of flocculants under the Praestol™, Zetag™ and Magnafloc* LT trade names. We are a worldwide leader in flocculant manufacturing and deliver consistent quality to customers looking to solve their biggest challenges. Our products are proven in all water and wastewater processes, including sludge dewatering, thickening and clarification.

Our range of flocculants perform well in a variety of solid/liquid separation technologies, resulting in optimized dewatering and higher cake solids.

Solenis flocculants are ideal for sludge thickening and dewatering with centrifuges, chamber filters, membrane filters, belt filters, disk thickeners and static thickening.

Our range of drinking water products, Magnafloc* LT and Praestol™ TR, comply with NSF Standard 60 and/or Drinking Water Inspectorate (DWI) regulations.

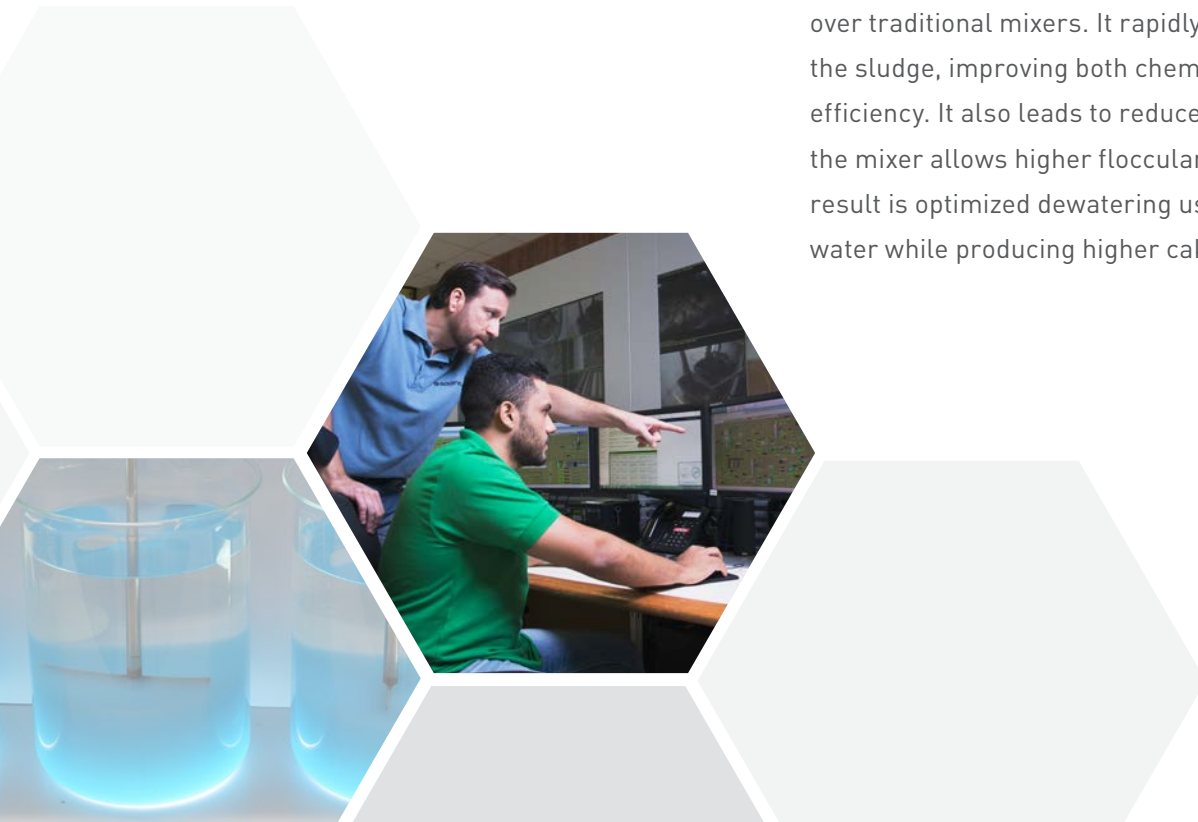
Praestol™, Zetag™ and Magnafloc* LT flocculants are available in a variety of molecular weights. Our manufacturing process leverages microorganisms to produce the desired end products, allowing for precise adjustment of the molecular weight and charge distribution together with an optimized molecular structure.

Flocculant Preparation Unit

All Solenis flocculants are available as powders and emulsions to satisfy the operating parameters and storage conditions of our customers. Regardless of the starting state, solid or liquid, our state-of-the-art preparation system dissolves flocculants more rapidly and effectively than conventional equipment.

DynaMax In-line Flocculant Mixer

The DynaMax In-line Mixer offers superior performance over traditional mixers. It rapidly injects flocculant into the sludge, improving both chemical distribution and efficiency. It also leads to reduced dilution water use as the mixer allows higher flocculant concentrations. The result is optimized dewatering using less flocculant and water while producing higher cake solids.



Defoamers

Foams at municipal water treatment plants are undesirable and often interfere with operations. Solenis offers a broad portfolio of defoamers, marketed under the Antispumin™ trade name, which are environmentally friendly and help control foam and entrained air in a variety of processes and applications. These include aerobic treatment, anaerobic digesters, dewatering centrates, secondary clarification and defoamers for thermal seawater desalination for drinking water production. The range of products also includes defoamers that are silicon free.

Our Antispumin™ defoamer product line includes:

- Products designed to prevent foam building in centrifuges.
- A range that is effective in controlling foam caused by filamentous bacteria, such as *Mircrothrix parvicella*.
- Products specifically for wastewater treatment in sequencing batch reactors (SBR), biological systems and chemical-physical systems.
- A portfolio for high-temperature flash distillation of seawater at desalination plants.



OnGuard™ AF Control System for Foam Control

An advanced solution for monitoring and controlling foam in wastewater systems

Historically, water treatment plants add excess amounts of defoamer to ensure performance. With the OnGuard™ AF control system, which delivers 24/7 real-time monitoring and control, overdosing defoamer is no longer a problem. The OnGuard™ AF control system uses a non-contact optical sensor to proportionally feed defoamer according to demand, making it possible to reduce chemical consumption by up to 50 percent.



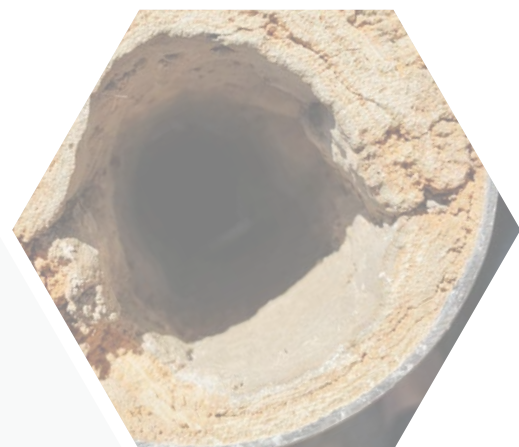
Scale Inhibitors

Formation of inorganic or mineral scales, such as struvite (magnesium ammonium phosphate), can be a significant problem for sewage treatment plants. Scales within pipe systems of a certain thickness may considerably reduce flow rate or even lead to a total blockage and can put increased strain on pumps. Mineral scales may also cause considerable damage to centrifuges, heat exchangers and pumps.

Our range of Polystabil™, Antiprex™ and Sokalan™ scale inhibitors effectively control a variety of scales in sewage treatment, sludge treatment and in desalination plants. The products are specially formulated to offer exceptional stabilization and dispersion properties yet remain biodegradable.

Our broad portfolio is suitable for a wide variety of applications:

- Prevention of carbonate and iron oxide or struvite scales in concentrates of centrifuges for sludge dewatering, pipes and pumps.
- Scale remover for sludge dewatering equipment like centrifuges, pumps and pipes. Our scale-removing product is biodegradable and highly effective for struvite scale removal.
- Prevention of scales that form during thermal and reverse osmosis (RO) membrane desalination of seawater.



Coagulants

Solenis has a wide range of organic and inorganic coagulants to suit your needs. Praestol™, Chargepac™, Magnasol™ and Magnafloc* LT coagulants are used in conjunction with flocculants to enhance the clarification of drinking or wastewater and to enhance the dewatering of municipal sludges. Some of our coagulants comply with NSF Standard 60 and/or Drinking Water Inspectorate (DWI) regulations for drinking water production, and some inorganic coagulants can be used to remove phosphates from wastewater.





Services, Support and Logistics

Solenis has a global footprint. We operate 39 manufacturing facilities and maintain a sophisticated distribution and logistics network. We provide best-in-class products and services — efficiently and cost-effectively — to any customer worldwide.

We have two leading research and development facilities located in Wilmington, Delaware (USA), and Krefeld (Germany). Our regional Customer Applications Laboratories are located in Wilmington, Delaware (USA), Barendrecht (The Netherlands), Krefeld (Germany), Shanghai (China) and Leme (Brazil). These facilities house extensive analytical capabilities and innovative instrumentation for application testing.

Health and safety performance of our customers and our organization has the highest priority at Solenis. We

are committed to the Responsible Care* program, the chemical industry's unique global initiative that drives continuous improvement in Environmental, Health, Safety & Security (EHS&S) performance, together with open and transparent communication with stakeholders.

Our production sites have a management system certified according to:

- ISO 9001:2015
- ISO 14001:2015, RC14001:2015
- ISO45001:2018

The certifications are a guarantee to our customers that Solenis is committed to high standards in Quality and EH&S.



Advanced problem-solving for your toughest challenges.

Solenis is a global leader in specialty chemicals for water-intensive industries. With an average of 20 years expertise, our team is the industry's most knowledgeable. That's how we solve your toughest challenges—whether you're in the pulp, paper, oil and gas, petroleum refining, chemical processing, mining, biorefining, power and municipal market. Combining the right people, the right experience and the right technology, we're built to deliver value.



 **SOLENIS**[™]
Strong bonds. Trusted solutions.

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