

SIZING & PRINTABILITY TECHNOLOGY

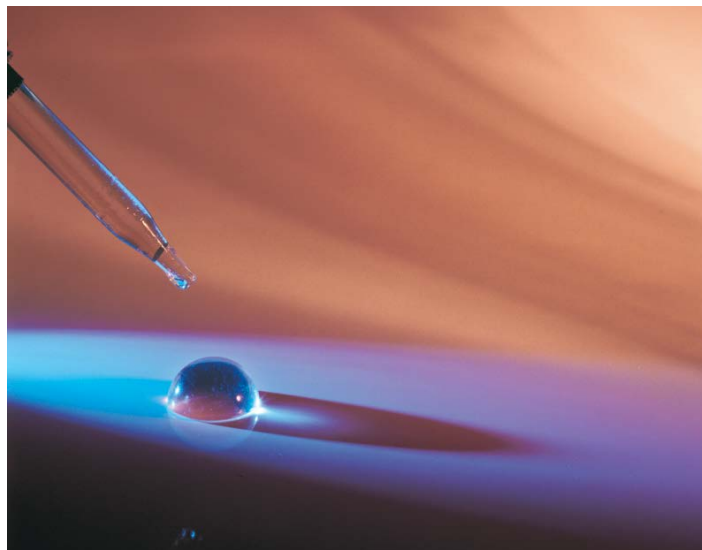
**Bringing the right products and people
to your papermaking**



Solenis is dedicated to helping pulp and paper mills operate more efficiently and profitably. We offer a state-of-the-art product portfolio that addresses nearly every aspect of papermaking. Our highly skilled team of field sales representatives, applications engineers, and research scientists ensure our products work in your specific mill environment. By bringing together the best of both worlds — innovative chemistries and innovative people — Solenis is setting the standard in papermaking excellence.

Sizing & Printability Technology

With shorter product life cycles and revolutionary changes in technology, looking to and being ready for the future is imperative in the papermaking business. At Solenis, we spend time downstream with your customer. And with our global research and dedicated on-site management approach, we're able to know, understand, and anticipate new finished product traits. This way, we're able to bring you different size and surface treatment technologies when you need them, helping you to meet your goals for end-use functions, adapt to different printing technologies, and have better machine runnability and performance.



Applications of Sizing

Our goal is to satisfy your current needs, address emerging markets, and foresee new finished product characteristics. Here are some of the current applications and areas in which Solenis sizing technology works to improve the paper and papermaking process:

END-USE REQUIREMENTS	
<ul style="list-style-type: none">• Liquid packaging• Offset printing• Inkjet printing• Oil- and grease-resistant properties• Gypsum liner	<ul style="list-style-type: none">• Packaging of wet foods• Shipment of iced poultry and produce• Converting ability (adhesives)• Waterfastness reductions
PAPER MACHINE OPERABILITY	
<ul style="list-style-type: none">• Size press holdout• Calender water box holdout	<ul style="list-style-type: none">• Coating holdout
SIZING AGAINST ACCIDENTAL WETTING	
<ul style="list-style-type: none">• Office papers• Cereal and cosmetic boxes	<ul style="list-style-type: none">• Grocery bags• Corrugated containers



Extensive Internal and Surface Sizing Product Line

No matter what paper product you want to produce, what machine you want to run on, or what quality and price equation you want to establish, Solenis has the most extensive array of products and technology to get you where you need to be.

Our rosin and reactive sizing solutions reduce fiber wettability and range from a variety of rosin soaps to the latest liquid reactive sizes. The following factors can influence your selection of internal sizing:

- Holding out water from the conventional size presses
- Paper grades requiring water holdout and/or oil holdout
- Paper grades requiring dimensional stability
- Interaction of surface size with OBA at size press
- Bleed-through and ink density requirements on inkjet printing.

Internal Size—Rosin

If your papermaking system is based on acid or semi neutral pH, we provide a variety of rosin-based technologies that work well for paper, board, and aseptic packaging grades. Depending on your geographic region, our portfolio includes both rosin soap and cationic dispersed size. Cationic rosin size dispersions have become the standard in the market and outperform other rosin size technologies. Solenis has developed a portfolio of cationic rosin size dispersions to meet the various end use and regulatory demands of the market that provide improved self-retention requiring less alum to achieve sizing.

Internal Size—Reactive

For systems that run an alkaline pH, we offer cellulose-reactive alternatives as ready-to-use emulsions or concentrated liquids that are emulsified at the point of use.

Ready-to-use emulsion-reactive sizes provide:

- High ultimate sizing
- Ease of use/convenience
- Improved paper machine runnability
- Machine cleanliness

Liquid reactive size is designed for commodity printing papers, recycled linerboard, and specialty applications. This technology allows the production of precision-converted grades: forms bond, cut-size, and envelope. Solenis' portfolio includes both liquid dimer technologies as well as ASA to meet this market need. Both types of products are tailored to customer needs for cost and paper machine runnability

Surface Treatment

Solenis' surface treatment products are capable of meeting the papermakers' needs for sizing, printability, toner adhesion, coefficient-of-friction control, porosity improvement, surface strength, and offset and inkjet print performance.

For printing papers, this technology offers product options for reducing fiber wettability and the radius of the pores or capillaries, making liquid penetration more difficult. For the inkjet and other digital print markets, there are a variety of demands. For inkjet, there is a balance of waterfastness, print density and print clarity for both dye based and pigment based inks. The imPress™ CL and imPress IJ series of products along with other sizing agents are designed to provide these properties. For other digital print there are a variety of toner adhesion and holdout demands that are met using products tailored for this market.



Solenis provides two technologies specific to different surface sizing requirements—solutions and emulsions. Solutions do a great job of keeping liquid from penetrating the paper, while emulsions help with better printability.

Other advantages seen with Solenis' surface size technology that impact machine performance, production costs, and sheet quality include:

- Less dependency on internal size for runnability across the paper machine
- More treatment options and quicker grade changes at the size press
- Flexibility to use harder-to-size pulp furnishes
- Cleaner-running, deposit-free machines
- Development of new grades



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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Global Headquarters
Solenis LLC
Wilmington, Delaware
Tel: +1 302 594 5000
solenis.com