

USFilter acquisition offers Siemens a promising water platform

## Global solutions for a universal solvent

Water is undoubtedly one of the world's most precious resources and an integral part of every manufacturing process, including those of the electronics industry. In 2004, Siemens purchased USFilter, a world leader in water and wastewater treatment equipment and services. In the following interview, Alan Knapp, director of the electronics market and strategic accounts at USFilter (a.k.a. Siemens Water Technologies), offers his insights on the importance of the acquisition and of water for the semiconductor industry.

*Why is Siemens increasing its focus on water?*

**Alan Knapp:** The water industry will spend approximately \$400 billion dollars this year purchasing equipment and services for everything from municipal drinking water systems to boiler feed water systems. The industry continues to grow as demands for purified water increase and the available fresh water supply shrinks. Many areas of the world are growing economically but lack the infrastructure to deliver clean water for municipalities or industrial users. In addition to fresh water, customers need waste treatment solutions to protect the environment and existing tributaries.

*Who is USFilter/Siemens Water Technologies?*

**Alan Knapp:** USFilter was incorporated in the early 1990s by a group of entrepreneurs

with the vision of building a "one-stop shop" for industrial, commercial and municipal customers in the water and wastewater treatment market. By assembling the best technologies and service offerings from small companies, USFilter was able to bring a large portfolio to a varying customer base.

Recognizing its opportunity to enter the market, Siemens purchased USFilter in 2004, which will be known globally as

Siemens Water Technologies as of October 2006. With the product and service offerings of USFilter in the water and wastewater markets, Siemens is now able to offer the technological expertise of both companies to customers on an international level through a worldwide network of sales.

*How important is water?*

**Alan Knapp:** Water is the world's "universal solvent" and, at the same time, the "lifeblood" for the human race. The water used in the critical manufacturing process, however, whether for growing and cutting a wafer or for producing a microprocessor, requires process expertise which can deliver water with extremely low impurity levels – less than one part per trillion. There is a major emphasis on delivering water of the highest purity to their process, while protecting the environment by treating waste streams and conserving water used within the manufacturing process.

*What do you provide specifically for the electronics industry?*

**Alan Knapp:** Siemens Water Technologies offers a complete pure water and wastewater solution to the industry, providing integrated treatment systems for the manufacturing process, protecting the environment and reclaiming water through treatment processes to conserve this precious commodity. Our core competency is to provide technology, quality equipment, services and reliable process solutions so that our customers can focus on what they do best.

**"Siemens Water Technologies offers a complete pure water and wastewater solution to the industry"**

**Alan Knapp**



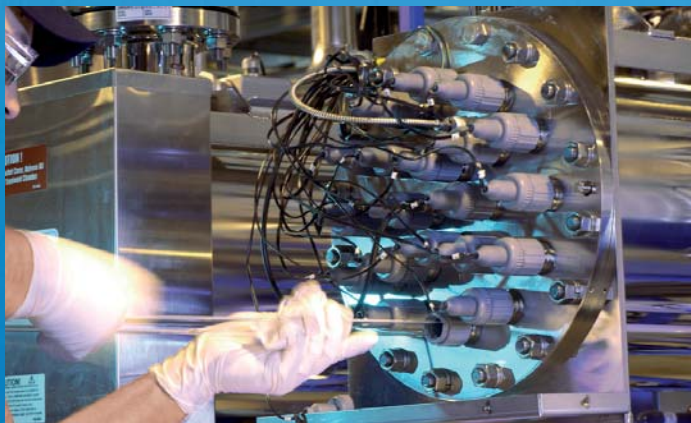
*Are there different demands in different regions of the world?*

**Alan Knapp:** Not for a given manufacturing process. However, the feed water quality, environmental conditions, regulatory requirements and quantity of fresh water available drive the need for a variety of different treatment approaches. Environmental protection agencies set minimum discharge requirements for treating wastewater effluent, and most companies treat to a level that exceeds local regulations. The cost and availability of water, as well as effluent treatment restrictions, drive the need for innovative technology. Now, for example, wastewater that would normally be discharged from the facility can be reclaimed and re-injected into the process water for manufacturing.

*In detail, what does the Siemens Water Technologies offering include?*

**Alan Knapp:** Siemens Water Technologies offers a full range of technologies and services for all the needs within a facility's central utility building. We own, manufacture and supply a wide variety of equipment and products including filters, ion exchange resin, continuous deionization units, membranes, clarifiers, chemical feed units, biological treatment systems, stripper/scrubber units, and filter presses, to name just a few.

**UV treatment is one of the solutions in the Siemens Water Technologies portfolio**



USFilter

In addition to equipment solutions, we offer experienced operations and preventative maintenance service for our equipment or that of other manufacturers. Outsourcing with Siemens means no downtime! We consider ourselves a part of the customer's factory team. This allows our customers the ability to focus on the manufacturing process and on improving yields.

*How will Siemens Water Technologies benefit Siemens?*

**Alan Knapp:** As part of the Siemens Industrial Solutions and Services division, Siemens Water Technologies is an integral member of the Competence Center Semiconductor Industry, providing an avenue to market – equipping our customers with many solutions in the manufacturing fab and support facility as one company. Together with Siemens Energy and Automation, we can offer an integrated system using Siemens-based controls and components, reducing the number of vendors a customer may have on a given system.

*And what about the customers? How will they benefit?*

**Alan Knapp:** As the director of the electronics market and strategic accounts, my team and I are customer focused. Driving

technology is what the electronics marketplace is all about. In many instances, we are aiding our customers by providing the insight, process experience, testing and analytical data to develop waste systems specific to their waste requirements. An example of that is our ammonia-treatment design for a large US microchip manufacturer.

*What does the future hold for the industry?*

**Alan Knapp:** In the past, the electronics industry has been very cyclical. As we continue down the path of digitalization, and as more countries grow economic-dependent, the demand for the microprocessor will bring continued opportunities for Siemens Water Technologies. The growth in flash memory, sustained logic processors, introduction of the photovoltaic and flat panel display, has contributed to industry growth. Manufacturers are better at managing demand for their product while creating new products. I believe we have the platform for solid sustained growth in a maturing market.

*Mr. Knapp, thank you for taking the time to speak with us.*

**With an increasing demand for purified water and shrinking fresh water supplies, water treatment is a growth market**



USFilter

Blühner

Siemens Water Technologies offers clients tailored water treatment solutions

## Flowing with innovative ideas

Two case studies convincingly illustrate the benefits of the tailor-made water treatment solutions of Siemens Water Technologies. In the first application, the addition of several tools at the facility of a US manufacturer required an increase in water consumption. This led the company to explore treatment options that would increase water availability by using the existing equipment, and to minimize capital cost and required floor space.

The system consisted of a conventional makeup system using filtration, a double pass reverse osmosis (RO) membrane, ultraviolet light and mixed bed equipment. Expanding the equipment would have required a sizable capital equipment investment and increased operating costs. Moreover, there was no available floor space.

The original system process design included ultra-filtration (UF) equipment where 5 percent of the UF reject is returned ahead of the makeup RO. By installing a new reject UF, 95 percent of the reject flow is sent directly to the UPW tank, thereby reducing the load on the makeup system. The remaining reject stream continues to feed back ahead of the makeup RO equipment for a complete reclaim of the flow.

Now, 182 liters per minute of water are reclaimed directly back to the UPW tank, increasing makeup capacity also by the same amount. This approach saved an additional \$200,000 over a conventional makeup system expansion.

The system proved to be a very reliable, simple and inexpensive way for the cus-

tommer to increase makeup capacity by approximately 10 percent. In addition to increased quality and reliability, operating costs were also lowered – what is more, at reduced required floor space (only 1.4 square meters).

### Multistage ammonia wastewater treatment

A large US semiconductor manufacturer required an ammonia treatment system to treat approximately 150 liters per minute of ammonia bearing wastewater. Design criteria included 24-hour per day operation and a system uptime of 99.5 percent or greater with the overall goal of reducing the amount of waste trucked off site. Siemens Water Technologies was selected to provide a solution for this unique waste stream.

Because the waste stream contained a number of contaminants in addition to ammonia at substantial concentrations, the customer preferred a modular approach using multiple units with incremental flow rates to treat to a low level of ammonia both in the aqueous and gas phase effluents.



Tailor-made treatment solutions frequently lead to substantial process benefits

Siemens Water Technologies designed a process capable of maintaining a steady pH with varying flow rates and influent contaminant concentrations. The pH adjusted water is then treated using multiple skid-mounted, dual stage strippers and absorbers. These modules were constructed as a single FRP integrated system, with internal walls separating the unit processes, and can be brought online as needed to match influent flow requirements. As a result, the need for on-site construction was reduced and the overall footprint required by the modules kept to a minimum.

Offering system redundancy and very high system availability without the need for a duplicate standby treatment system, the system exceeded the customer's treatment requirements and expectations. Use of the multistage stripper allows a low profile system while maintaining stripping efficiency. ■

**Alan Knapp,**  
**Siemens Water Technologies Portland**  
**E-mail: alan.knapp@siemens.com**