

Press release

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Hager + Elsässer implement prestigious project for Russian semiconductor producer

Ultrapure Water System Starts Operation

***Stuttgart.* In November 2015, system manufacturer Hager + Elsässer put a UPW (Ultra Pure Water) system into operation at Russian semiconductor manufacturer Angstrom-T. The system, which was built as part of a new construction for the ultra-modern wafer manufacturer, produces 100 m³ of ultrapure water per hour. Hager + Elsässer offered the client a convincing system concept that significantly reduces the use of chemicals and produces ultrapure water with very low residue content. This was one of the largest projects ever to be implemented for the semiconductor industry in Russia.**

Water is one of the most important components in the manufacture of microelectronic devices. Ultrapure water is used to produce chemical solutions, to pickle workpieces and for other technological processes as well as for rinsing the crystals on circuit boards. The water used in the microelectronic industry must fulfil particularly stringent quality requirements.

The current standards for the manufacture of semiconductors recognise four water types, depending on the size of the semiconductor elements being manufactured with the help of the water. The Angstrom-T UPW water system in Zelenograd produces ultrapure water for elements with sizes of 90 to 130 nm. Reserve has



also been provided in the event of a transition to technologies with structure sizes of 65 nm and less. Because the smaller the nanometre range of the products to be manufactured, the stricter the purity requirements for the water employed in the manufacturing process. "In the semiconductor industry, the ultrapure water quality always has a crucial influence on the product quality and manufacturing process efficiency. After all, 30% of the processes involve rinsing silicon plates," explains Anatoly Sukhoparov, managing director at Angstrom-T AG. Planning for the new system began in April 2013. "We have been successfully working with Hager + Elsässer since the early 1990's. For this job, we were once again able to find an optimal solution that offered both convincing costs and strong quality," reports Anatoly Sukhoparov.

The system installed by Hager + Elsässer consists of a number of treatment steps that bring the water up to the required quality: Preliminary cleaning, demineralisation, in-depth cleaning (deionisation), degassing, treatment with UV light, ion exchange and ultrafiltration. A multi-media filter and an active charcoal filter are used for the pre-treatment of the raw water. In the make-up process step, the pre-cleaned water is freed from unwanted particles, organic and inorganic impurities and ions by means of a process that combines reverse osmosis and electrodeionisation (EDI). A special boron polisher ensures that the boron specifications called for by the "International Roadmap for Semiconductors" guidelines are met. The concluding final cleaning takes place in the so-called polishing loop. "Our two-stage procedure provides significantly improved treatment results with regard to purification. It also allows for much longer treatment periods and therefore ensures savings achieved due to less



frequent resin changeovers,” says Eugen Martens, Project Manager of Hager + Elsässer.

The new UPW system removes virtually all inorganic and organic accompanying substances and ions from the groundwater used. Thus, the procedure meets the stringent requirements with regard to minimising residues.

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HAGER + ELSÄSSER

H + E GmbH has had its headquarters in Stuttgart for over 80 years and is a leading manufacturer of plants for industrial process water treatment, ultra pure water treatment and wastewater treatment for a wide range of industries. H+E plants are currently installed in over 160 countries across the globe. In addition to its main location in Stuttgart, H+E also has branches in Dresden (manufacture and production), UK, Malaysia, the Philippines, Singapore, Thailand and sales offices in Russia, Chile, Egypt and Australia.

AQUARION AG

Headquartered in Switzerland, Aquarion AG is an EPC solution provider offering a comprehensive range of industrial water treatment solutions for many different industries, and constantly incorporates the latest technologies and processes into the solutions it offers.

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See below for photos. All photos are attached to this e-mail in printable quality or can be obtained from the press contact above.



Illustration 1: The plant produces Ultra Pure Water by combining reverse osmosis and electrodeionisation.



Illustration 2: The ultrapure water membrane degassing for oxygen removal.



Illustration 3: The ultrapure water UV system for TOC reduction and disinfection.