



Tech Talk From

Prisco®

Tech Talk #6

THE ADVANTAGES OF PROCESS WATER

PriscoTech® water management systems offer complete process control over all aspects of your press-ready water supply and fountain solution. The **AquaFlo® II** Water Processing System is the initial treatment step, taking your incoming water, whatever its characteristics, and transforming it into **process water**. Process water is water specifically designed for printing. With its consistency, you eliminate one of the key variables in your pressroom. By controlling your variables, you minimize operating problems, reduce waste, and improve the quality of your finished product—ultimately increasing your profits.

With the **AquaFlo® II** Water Processing System, your water benefits from multiple procedures, including particulate filtration, advanced membrane separation, carbon adsorption, and chemical component stabilization technologies.

Frequently, we're asked to define the difference between process water and the water that is produced through reverse osmosis or deionization methods. Let's discuss the differences, and the advantages to using process water from an AquaFlo® II Water Processing System.

Why shouldn't a printer use incoming tap water?

Your local water supplier is primarily concerned with generating safe drinking water. Because of seasonal changes and chemical additives put in by these local water suppliers, fresh water can vary . . . and cause you real problems on press! Even pure fresh water is not compatible with the printing process. Printers don't need pure water—they need water that is stable, consistent and supports the chemical process of their fountain solution concentrates so they get the maximum benefit from these ingredients.

What is the difference between RO (reverse osmosis) and DI (deionized or demineralized) water?

Reverse osmosis is a mechanical process, passing water through a semi-permeable membrane. Almost all the mineral salts dissolved in the water, including the salts that contribute to hardness and alkalinity, are removed. This method concentrates oxygen and carbon dioxide gases in the water.

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Deionization, in contrast, is a chemical process. Almost all the ionized minerals and salts in water are removed during an exchange with hydrogen and hydroxide ions which are present on small plastic beads—the resin beds—in the DI tanks. In this chemical interaction, the ions in the resin beds and the water actually unite to form water molecules, resulting in “pure” water. This method is best suited to operations with a constant throughput and demand for the treated water.

Why isn't process water from the AquaFlo® II system the same as water from a reverse osmosis process? Or from the deionization process?

One of our key treatment steps, advanced membrane separation technology, is similar to reverse osmosis—but we don't stop there. The AquaFlo® II system utilizes special, selective rejection membranes. To reduce variability in your fountain solution chemistry, these membranes remove the mineral salts that cause hardness and increase alkalinity. They are customized, however, to allow some mineral salts to remain in the water, to help make it less aggressive and to minimize the negative effects of dissolved gases. Special pre-filtering and chemical post-treatments give our process water the specialized characteristics and the chemical stability required by today's printing industry. The AquaFlo® II system has a user-friendly design, with indicators to remind the operators to change the pre-filters, measure water quality, and provide system status information.

What are some of the potential issues with DI or RO water?

Deionized water is very aggressive from a chemical perspective—which means that it can begin to dissolve almost anything it contacts, increasing corrosion on your plates and press components, unless your fountain solution contains corrosion inhibitors. This type of water can also lead to over-emulsification of inks.

The AquaFlo® II post-treatment chemical stabilization step makes the water less aggressive and provides a conductivity between 35 and 70 microsiemens and a very stable pH.

Because DI resin beds “age”, over time they can add ions that contribute to conductivity and pH variation toward the end of the exchange cycle. From the time the tank is new until the time you exchange DI tanks, the quality of the water changes. This means your printing process can change as well. With DI tanks, the resin beds must be closely monitored so that you schedule tank exchange with your service company at the correct time.

The advanced separation membranes in the AquaFlo® II will last for several years without a reduction in the consistency of your pH and conductivity. When you do need to make a change, replacement is quick and easy. The AquaFlo® II is an automatic system and constant monitoring is not required.

When water moves through the DI resin beds, it can begin to wear channels, allowing untreated water to pass through the resin bed without being completely deionized. This results in water of “unknown quality” mixing with your DI water. Chemical changes in the resin beds can be caused by organic substances, excess chlorine, or high levels of oxygen in the incoming water supply. When the resin beds are fouled or oxidized, their exchange capacity is reduced, resulting in higher costs for your DI water.

The AquaFlo® II does not use resin beds, so there is no channeling issue: 100% of the water is treated 100% of the time. Special pre-filters in our system remove components that could impact the treatment process.

RO water is chemically unstable. The RO membranes act to concentrate dissolved gases in the treated water, at a level 2 to 4 times greater than the incoming water supply, depending on its characteristics. This means that carbon dioxide variations in the incoming water are actually amplified during the RO process, with the result that your press requires differing amounts of buffers in its fountain solution. This can be an operating headache! Another variation can result from storing the water in translucent plastic tanks with unprotected air vents, common on many RO systems. Light promotes biological growth, and the air that is introduced into the tank carries spores and organic matter that can promote contamination.

Because of the AquaFlo® II's advanced separation technology with its exclusive selective rejection membranes and its unique post-treatment stage, these harmful concentrated gases are eliminated, creating a stable platform for your fountain chemistry. In addition to storing our process water in an opaque blue storage tank to protect it from various light sources, air filters protect the storage tank from contaminants in the pressroom, including fungus, bacteria and offset spray powder.

What can I do to minimize fungus or slime in my press fountains?

In fact, DI resin beds and storage tanks can be contaminated by bacteria and other organic compounds found in the pressroom.

Separation membranes in the AquaFlo® II act to physically remove bacteria from the water before it is processed. The opaque storage tank with its air filters protect the water until it reaches your press fountains.

How can I guarantee consistent quality control when my demands for water grow?

During your workweek, demands for water fluctuate greatly, from heavy flow and volume for a Monday morning start-up to virtually no demand during most of the week. DI water systems do not perform well with this usage pattern and may need a recirculation loop so that the water is pumped through the resin bed continuously. This motion helps prevent contamination of the water sitting in the resin bed, with its resultant pH shift and risk of biological contamination. The downside of this water movement is the promotion of the negative effects of channeling. As demand for more water builds, a DI resin bed needs to be changed more often, or additional tanks need to be added. This increases your monthly rental charge and exchange fees.

The AquaFlo® II can sit idle for several days with no adverse effects on consistency or stability of the water. The system is automatic, so it turns itself off when the storage tank is full. As we discussed above, the stored water is stable and protected. The AquaFlo® II is available in different processor and storage tank sizes, with flexibility to easily increase your production. Your Prisco technical service rep will size your system to allow for some growth.

What about cost comparisons?

DI water is very expensive pure water originally designed for lab, semi-conductor or chemical applications—and it doesn't completely meet the needs of the printer. Every purchase plan can

be structured differently, but remember that when you commit to DI water, you normally commit to ongoing tank rental and exchange fees. An RO system is typically sold as capital equipment, but has maintenance costs based on the system design, its type of filters and their replacement schedule.

With the AquaFlo® II, you have a one-time purchase price with a very short payback period, as we will demonstrate in our proposal to you. Maintenance of our system is minimal: three filters and a post-treatment cartridge can be changed quarterly by your own maintenance department. The AquaFlo® II provides greater value to your operation, when compared to an RO system, because its process water is designed to optimize your productivity on press.

How can I learn more about these systems?

Contact your local **PRINTERS' SERVICE** sales office. Your sales and technical service representatives will help you analyze your operation and recommend a system specifically suited to your needs. We'll help you understand how the AquaFlo® II Water Processing System can have a positive impact on your productivity, your quality, and your profits

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As always, your local PRINTERS' SERVICE office is happy to answer your questions:

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