WaterProfessionals®
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eGuide to

Industrial Water Purification Systems

Industrial water purification systems are typically used to treat large volumes of water at high-flow rates. The type of water purification equipment utilized in a system will largely depend upon contaminants in the raw water and the purity required for the process.

WaterProfessionals® is a leading provider of cutting-edge industrial and commercial water purification systems. We offer a variety of water purification equipment capable of meeting the most demanding water treatment needs, including custom industrial water purification systems.

Water treatment methods commonly used in industrial water purification systems consist of:

- Softening
- Dealkalization
- Demineralization / Deionization
- Reverse Osmosis
- Microfiltration
- Multimedia Filtration
- Nanofiltration
- Ultrafiltration

Industrial water purification systems are frequently used to meet the high-volume water treatment needs of healthcare facilities, laboratories, hotels, manufacturing plants, schools, restaurants, and other organizations with high-volume water use that require improved water quality.

High-capacity industrial water purifications systems are capable of effectively removing from source water:

- Arsenic
- Asbestos
- Chlorine
- Dissolved Solids
- Iron
- Manganese
- Microbes
- Minerals
- Nitrates
- Organics
- Rust
- Sediment
- Sulfates ...and more

WaterProfessionals® will work with you to evaluate your water usage, understand your specific industrial water treatment needs, and recommend the most economical and efficient water treatment system for your business.

Whether you need a high-capacity industrial reverse osmosis system or a streamlined ultrapure water purification system, we have the equipment and expertise to meet your needs!

WaterProfessionals® is staffed with knowledgeable and experienced water purification systems engineers. No matter what your water purification system requirements may be, we have leading edge technologies, a stellar reputation for top-notch service, outstanding results, appropriate water purification process systems, and affordable top-quality water purification equipment.

Let's explore the most commonly used water treatment methods in the industry.

Softening

The primary purpose of hard water softening is to prevent the precipitation and buildup of hard water minerals in equipment and piping. Reduction or elimination of hard water scaling can be performed using physical treatment equipment. Conventional water softening is most often based upon a process known as ion exchange, utilizing a synthetic polymeric (plastic) material in the form of very small beads called ion exchange resin.

Dealkalization

This can be used to treat water in boilers operating at less than 700 psi. The process is similar to water softening, in that it utilizes ion exchange to remove unwanted ions from a water supply. However, rather than removing calcium and magnesium ions, dealkalization removes carbonate ions, exchanging them for chloride ions.

Deionization

In-house deionizers automatically regenerate on a pre-set frequency, consuming acid and caustic, and then discharging a waste stream containing high concentrations of the acid and caustic. However, these systems are expensive to purchase and can be very maintenance-intensive. The other option for this process is service deionization, also referred to as "portable exchange deionization", which uses tanks containing deionization resin that is plumbed right into your process water system with regeneration being carried out at the vendor's site.

Reverse Osmosis

Reverse osmosis systems utilize man-induced pressure on the "dirty side" (high mineral content side) of a semi-permeable membrane, to overcome the natural osmotic pressure trying to flow the other way. This includes added pressure to speed the process, in order to force water across a semi-permeable membrane to the "clean side". In the RO process, 98% or more of the dissolved minerals are left behind on the "dirty side" of the membrane.

Microfiltration

This is a physical filtration process that removes suspended solids from water by utilizing a small pore-size filtering medium, typically a membrane. Unlike reverse osmosis and nanofiltration, microfiltration utilizes only physical filtration to remove particles in the 0.1 to 10 micron range, including bacteria. Unlike nanofiltration and RO, microfiltration does not remove dissolved contaminants.

Multimedia Filtration

This refers to a pressure filter vessel, which utilizes three or more different media, as opposed to a “sand filter” that typically uses one grade of sand alone as the filtration media. In a multi-media filter, during the “settling” cycle, the finest or smallest media particles remain on top of the media bed while the larger, and heavier particles, stratify proportional to their mass lower in the filter. This allows the multi-media filter to hold a much larger mass of “dirt” before backwashing.

Nanofiltration

Nanofiltration is most often used to recycle wastewater. The design and operation of nanofiltration is very similar to that of reverse osmosis, with some differences. The major difference is that the nano membrane is not as “tight” as the reverse osmosis membrane. It operates at a lower feedwater pressure and it does not remove monovalent ions (i.e., those with a single charge or valence of one) from the water as effectively as the RO membrane. A nanofiltration membrane typically removes 50% to 90%, depending on the material and manufacture of the membrane.

Ultrafiltration

Ultrafiltration (UF) utilizes a semi-permeable membrane to physically remove suspended particles from water based on particle size and the pore size rating of the UF membrane. Among membrane technologies commonly used, UF is typically one step “tighter” (meaning it has smaller pore size) than microfiltration. Ultrafiltration is very effective at removing tiny particles which can quickly foul reverse osmosis membranes, thus reducing the silt density index of the water.

With an appropriately configured industrial water purification system in place you can enhance your capability and strengthen your revenues. Let WaterProfessionals® be your industrial water purification partner. Find out for yourself why we are one of the most sought-after industrial water purification systems manufacturers in the industry!