

You could give your people

*Culligan Water*

# Facilities Engineers and Maintenance Managers Guide: Water Treatment Solutions Design and Application



Reynolds Culligan Water specializes in comprehensive industrial and commercial water treatment solutions for a diverse client base. With nearly 75 years of local ownership and operation in the Mid-Atlantic region, Reynolds Culligan is uniquely positioned in the market to assist clients in Maryland, Delaware, Pennsylvania, and New Jersey in addressing their water challenges. We pride ourselves in offering facility engineers and maintenance managers the only single-source treatment technology platform available in the service area that's capable of handling virtually any application.

Learn more about water treatment services, the various types of services available for water purification and filtration, and how the team at Reynolds Culligan can help with custom system design and engineering based on your treatment needs.

## What Are Water Treatment Services?

Water treatment services remove unwanted particulates, minerals, and contaminants from a water supply to meet certain operational and safety standards for consumer, commercial, and industrial use. Various treatments can generate water suitable for human consumption, crop irrigation, manufacturing, chemical processing, or even recreational water applications. To achieve the necessary level of water quality, facilities across various industries must use one or more of several treatment options. These services include:





The Reynolds Culligan team can help design, manufacture, install, and service custom water treatment solutions to address the unique needs of your facility.



# Deionization

Certain applications require water of particularly high purity levels, lacking mineral cations like calcium, sodium, iron, and copper, as well as mineral anions like chloride and bromide. For these instances, deionization utilizes specialized ion exchange resins to effectively bind to mineral salts in the water supply and then eliminate them. Depending on your application, deionization can create one of three water types:

- **High-purity/ultrapure water.** As the name suggests, high-purity water adheres to the strictest standards for quality and purity. A three-step technique involving pretreatment, primary purification, and polishing successfully eliminates an array of contaminants, chemicals, and compounds from the water.
- **Medical-/lab-grade water.** A subset of high-purity water, this water type specifically complies with the standards defined by regulatory organizations like the Clinical and Laboratory Standards Institute, College of American Pathologists, and US Pharmacopeia.
- **Demineralized/deionized water.** Treated water of this type has had all of its mineral ions from sources like dissolved salts removed. However, unlike ultrapure water, non-mineral compounds and organic particles may potentially remain in deionized water.



Culligan® Premier Series Deionizer Systems



Culligan® Portable Exchange Deionizer (PEDI) Systems

## Reverse Osmosis

This water treatment technique strips sizable contaminants and ions from a water supply. Unprocessed water flows from one side of a semipermeable membrane to the other under pressure. The membrane catches dissolved solids such as chemicals, salts, minerals, microorganisms, and high-molecular-weight organic contaminants, purifying the water as it passes through.

This process is cost-effective, improves the taste of water, and enhances its appearance. Reverse osmosis systems are also easy to install and maintain, with the added benefit of being more energy efficient than distillation and more environmentally friendly than bottled water.



Culligan® IW Reverse Osmosis Systems



Culligan® G3 Series Reverse Osmosis Systems

## Dealkalization

The dealkalization method reduces processed water's alkalinity, or its pH level, by removing alkaline ions. The technique assists in ion exchange utilizing chloride-form anion resins, targeting carbonate, bicarbonate, sulfates, and nitrates. The process forces feed water into contact with a concentrated anion resin, which then disrupts the structure of the pretreated water. Using a brine or salt resin concentration of 5 lbs for each cubic foot in a dealkalizer, the equipment can remove carbonates and bicarbonates at rates of 90 to 95% as well as sulfates and nitrates at 99%.



The process is important for safeguarding against hard water scale and component corrosion. Dealkalization lessens the likelihood and frequency of repairs to decrease costs and supports system longevity.

## Filtration

Filtration uses one of several types of media to collect and remove particulates, solids, and other contaminants. Reynolds Culligan specializes in:

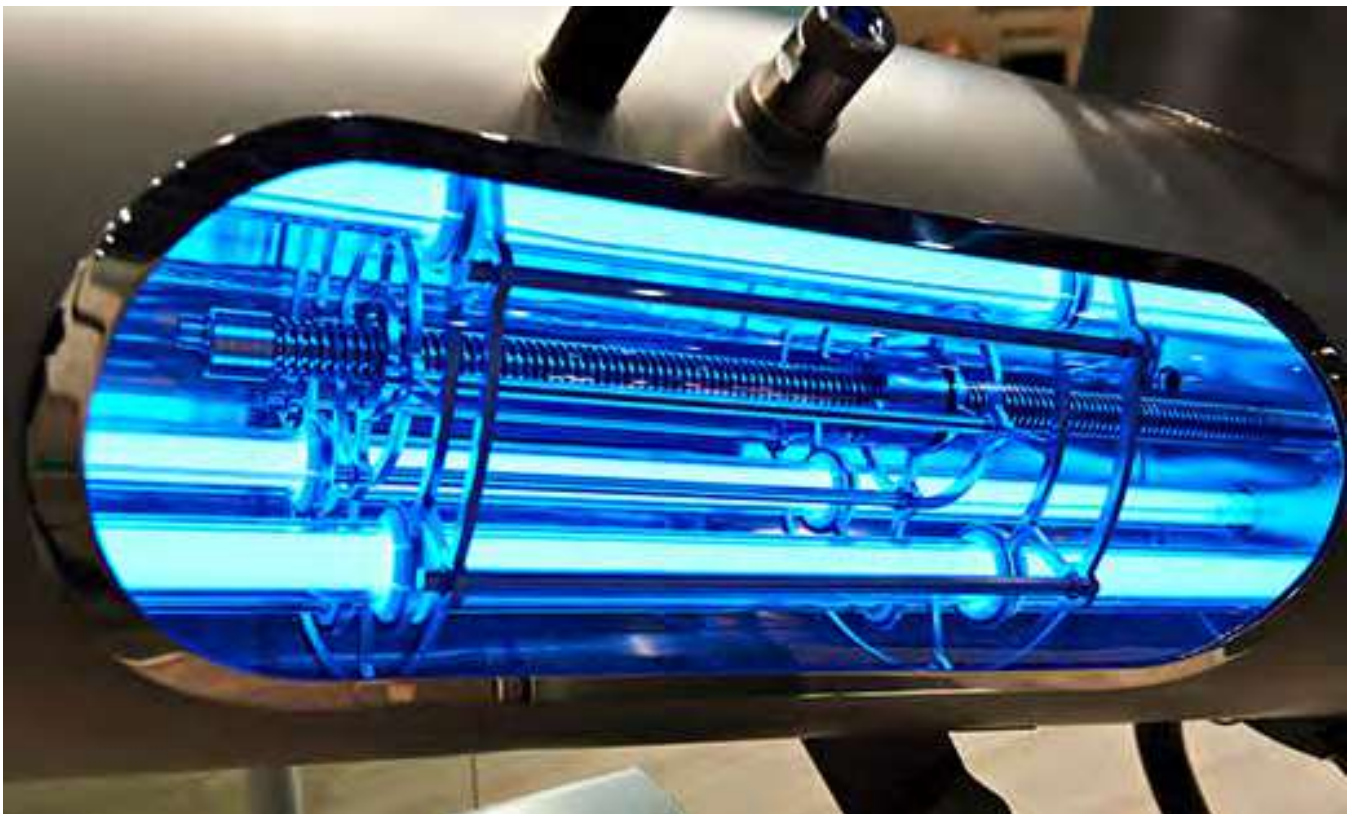
- **High-purity/ultrapure water.** Carbon filtration systems. These systems remove compounds that alter water taste, odor, and coloring. They use an array of carbon media for absorbing everything from small particulates, volatile organic carbons (VOCs), and halogens to, in certain cases, heavy metals like lead.
- **Multi-media filtration systems.** As the name indicates, these systems use multiple filtration media varieties and sizes to separate water from solid contaminants, large or small.
- **Ultrafiltration and nanofiltration systems.** These systems use semipermeable membranes for separating out particularly tiny suspended solids. Nanofiltration membrane pore size is the smaller of the two, allowing these systems to remove 50 to 90% of water's dissolved ions.

Whatever the media type, water filtration generally has five stages. The system takes in untreated water using pumps or gravity, clarifies it for optimal solid coagulation, disinfects against biological contaminants, carries out ion exchange, and then distributes treated water throughout a system. Filtration allows facilities to reuse their own water instead of relying on local municipal systems, increasing sustainability and efficiency while reducing energy consumption.

## Ultraviolet Disinfection

UV disinfection sterilizes feed water to ensure the end result is safe, potable water. UV-disinfected water is also ideal for sensitive manufacturing processes. This technique uses UV light radiation to eliminate as much as 99.99% of giardia, E. coli, and other such microorganisms and viruses in untreated water, causing their DNA structure to break down.

This low-maintenance, low-energy process requires no chemicals to carry out the disinfection process, yet it's still highly successful at removing pathogens. UV disinfection systems can help you comply with ASTM, AAMI, MCCLS, and CAAP standards for water. Also, it won't alter water's taste, odor, or coloration.



## Reynolds Culligan's Design and Application Capabilities

At Reynolds Culligan, we understand that a water treatment system is only as good as its design. To that end, we work closely with our customers to design and engineer custom systems, with careful attention paid to the arrangement of every pipe, pump, and infrastructure component.

Our team will start by surveying your facility so that we can gain an in-depth understanding of the following for your specific site:

- Current water composition and quality
- Desired purity level for treated water
- Expected volume of water to undergo treatment
- Water pressure
- Drainage systems

This evaluation is free of charge. Once completed, our experts will advise you on the recommended water treatment system, system infrastructure, and related services to achieve your goals.

## Water Treatment Solutions From Reynolds Culligan

By eliminating contaminants and other undesirable particulates from your facility's water with the appropriate treatment system, you'll both improve site safety for workers and ensure product integrity. At Reynolds Culligan, our end-to-end water treatment services range from custom system design and engineering to superior after-sales equipment and customer support.

If you're a facility engineer or maintenance manager looking for a reliable, high-performance, and cost-effective industrial water treatment system tailored to your specific facility, turn to the team at Reynolds Culligan. [Contact us](#) for more information on how we can support your operations, or [get a free estimate](#) today.



## About Us

Established in 1950, Reynolds Culligan Water began its journey with the mission of providing the Eastern Pennsylvania region with superior water treatment solutions. Today, as a fourth-generation, family-owned Culligan dealer, we continue to be committed to offering premium water treatment services to our valued customers in Pennsylvania, New Jersey, Delaware & Maryland. With a combined experience of over 300 years in the industry, our Reynolds water treatment solutions are tailored to address the unique water challenges facing our region, and our skilled team has the knowledge and expertise to provide customized solutions for even the most complex water treatment challenges. With our over 100 years of combined industry experience, competitive prices, and professional after-sale services, you can be confident that we provide exceptional products, service, and follow-up.

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