

## CRITICAL WATER SYSTEMS & SERVICES

- ✓ Mixed Bed Ion Exchange
- ✓ Reverse Osmosis
- ✓ Microfiltration & Ultrafiltration
- ✓ Birm Filters
- ✓ Water Softeners
- ✓ Ultra Violet (UV)
- ✓ Multimedia Filters and Activated Carbon Filters

Hydro Flow is a leading provider of Industrial Water Treatment equipment and services. The Hydro Flow *Equipment Support Group* (ESG) also provides an array of process design and project management capabilities, and provides ongoing support Australia-wide for all new and existing installations. Our support programs include full commissioning, emergency and preventative maintenance programs, and the supply of all equipment spares and consumables. The often critical nature of water systems requires immediate responses to system breakdown. Rigorous preventative maintenance programs can be designed to minimise loss of system efficiency and unscheduled downtime. Hydro Flow engineers are located Australia-wide to provide the high level of support required for the uninterrupted and efficient operation of your *Critical Water Systems*, and are able to conduct baseline and optimisation studies.



### Ion Exchange

Mixed bed ion exchange uses a combination of cation and anion resin to remove dissolved solids. The solids are replaced by hydroxide and hydroxyl ions which combine to produce high purity water.

Cation and anion units can experience problems with resin fouling and breakdown, loss of regeneration capacity and overall reduced system throughput. Valves and seals also require regular checking and replacement. Servicing ion exchange systems involves the removal of resin foulant and accumulated suspended solids, checking of all backwashing and regeneration sequences and the associated valving, and checking of regenerant uptakes and flow rates. Partial or complete resin replacement may also be required.



### Water Softeners

Water Softeners are used to remove calcium, magnesium and other metals from hard water by exchanging them with 'soft' ions via an ion-exchange process. Common applications include pre-treatments for utility water and process water.

Over time water softeners can be fouled with organic matter and incoming contaminant. Resin breakdown is also commonly encountered. Resin fouling will reduce unit performance and affect flow throughput. Hydro Flow service programs include checks and repairs of valves and seals, monitoring regenerant uptake, optimising resin condition and quality, and restoring unit performance to original specifications.



### Microfiltration (MF) & Ultrafiltration (UF)

Microfiltration (MF) & Ultrafiltration (UF) are classes of membrane filtration processes in which hydrostatic pressure forces a liquid against a semipermeable membrane. Suspended solids and solutes of high molecular weight are retained (microorganisms and suspended particles), while water and low molecular weight solutes pass through the membrane. These processes are typically used for drinking water treatment or recycling water.

Over time, organic matter and inorganic matter build up on the fibres of these membranes and can reduce the recovery, performance and flow throughput. The servicing of MF and UF systems includes specialised cleaning processes (CIP) and Integrity Testing (ITs).



### Reverse Osmosis

Reverse osmosis (RO) is a water purification technology that forces high pressure water through a semipermeable membrane. RO is typically used for drinking water and ultra-pure water purposes, and is commonly used for water recycling.

Accumulation of organic and inorganic matter on the polyamide structure of the membranes will reduce the recovery rates, performance and flow throughput. The servicing of an RO system includes monitoring levels, cleaning (CIP) and replacement of membranes.



### Multimedia Filters & Activated Carbon Filters

*Multimedia Filters* are used to remove particulate matter from waste water, as side stream filters for cooling towers, or as a form of pre-treatment for process water. They typically consist of three different layers; anthracite coal, sand and granite. Each layer serves to filter out different sized particles, phosphorous and other organic compounds from water.

*Activated carbon* treatment uses granular activated carbon media for the removal of odour and chlorine from water. They are typically used in drinking water treatment and beverage production.

Over time, Multimedia Filters & Activated Carbon Filters can be fouled with suspended solids, organic matter and debris. This kind of fouling deteriorates their performance by reducing flow throughput and reducing their backwash efficiency. Servicing these filters involves the removal of suspended solids and cleaning the filter media to ensure the optimal performance of the filter.



### Birm Filters

Birm Filtration is an efficient and economical media for the reduction of dissolved iron and manganese compounds from raw water supplies. It may be used in either gravity fed or pressurized water treatment systems. Birm acts as an insoluble catalyst for the reaction of iron and manganese with dissolved oxygen (DO).

Over time dissolved iron and manganese compounds oversaturate the media and reduce the performance of the Birm Filter. Servicing Birm filters includes performing maintenance on parts such as seals and valves, and conducting cleaning and refurbishment of the filter media.



### Ultra Violet (UV)

Ultra Violet (UV) systems use ultra violet light to destroy organic compounds, bacteria and viruses in water. UV is typically used for drinking water and ultra-pure water purposes.

Over time, organic matter and dust can form a layer on the sleeves of the UV lamps to significantly reduce UV light intensity and in turn reduce the performance of the UV lamps and process. The servicing of a UV system includes the monitoring of the UV intensity of each UV lamp and its replacement when the UV intensity has been reduced significantly. Monitoring UV intensity ensures that the UV system is treating water at its optimum capacity.