

# Utility Water Treatment

## Cooling Towers & Boilers

**Pre-Conditioning, Re-Conditioning and Re-Purposing of  
Utility Water**

**Removal of Hardness & Turbidity**

**Removal of Bacteria, Algae, Slime, Micro-Organisms  
Disinfection and Microbial Control**

**Removal & Separation- Salts of Calcium + Magnesium +  
Silica + Phosphates + Sulphates + Fluorides + Nitrates**

**Aid Descaling of Utilities like Cooling Tower, Chillers and  
Boilers**

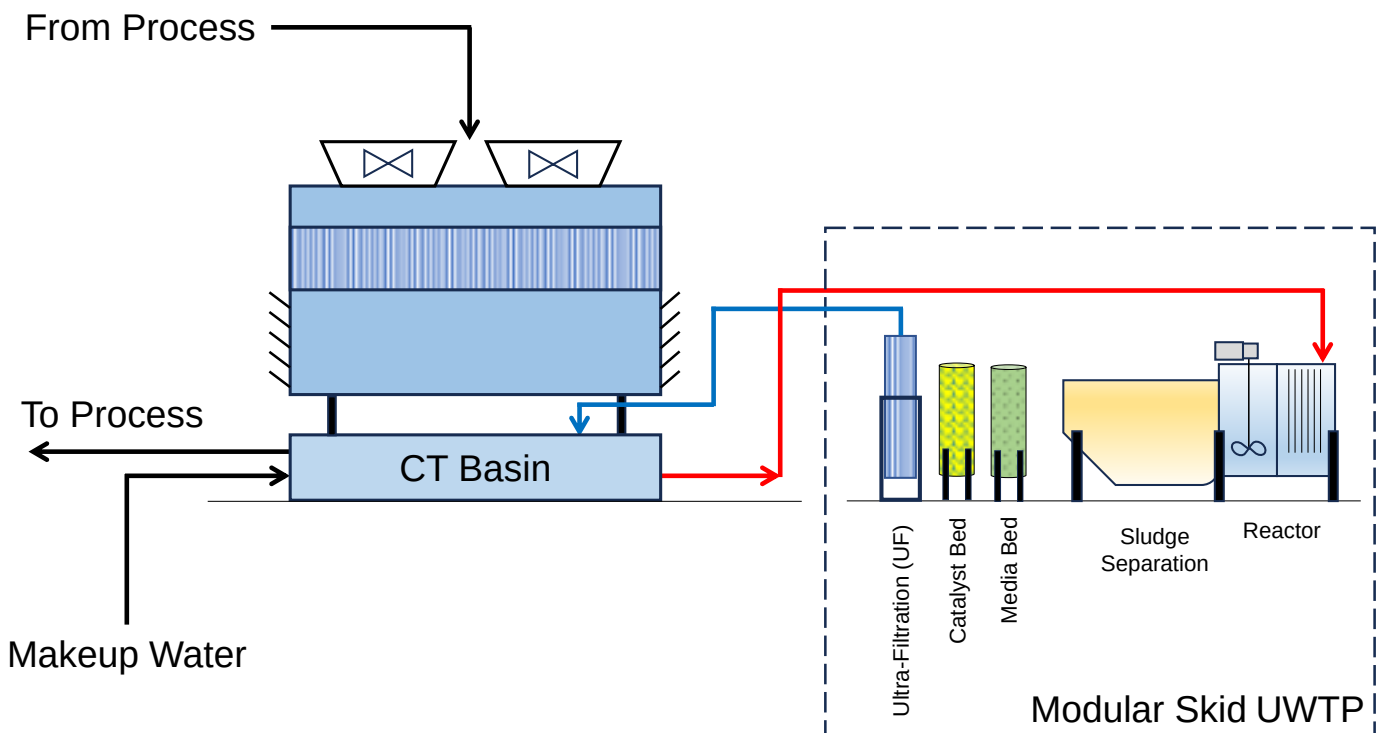
**Achieving Higher Cycles of Concentration (COC) with  
reduced risk of Corrosion, Scaling and Fouling Tendencies**

# Utility Water Challenges

- ➔ **Higher Utility Blowdown Frequencies-** Increased load to ETP
- ➔ **Reduced Efficiencies and Degrading Performance of Cooling Towers and Boilers-** Lower temperature difference ( $\Delta T$ )
- ➔ **Impaired Heat Transfer because of Biofilm and Fouling-** Development of Organic and Inorganic complexes, micro-algae and fungi, micro-organisms forming a slime layer over time
- ➔ **Increased Consumption and Costs of Dosing Chemicals-** pH Adjusters, Phosphonate Sequestrants, Polymer dispersants, Algacides and Biocides; which in turn also increases the ORP within the cooling water system
- ➔ **Continuous damage to Cooling tower and Reduced Life-** Depletion of capital investment and higher overall operational costs

## The Solution- Boson Alchemies Utility WTPs

Boson Alchemies Utility Wastewater Treatment Plants (UWTPs) are innovative and truly versatile systems for the effective treatment of diverse list of objectives and problem statements. Our UWTPs are continuous, totally compact, skid based and self-contained, covered, single-piece packaged system for inline Utility wastewater treatment.





Ours uses an electrochemical oxidation process where we electrolytically oxidize a sacrificial anode to release metal ions that form coagulants, destabilizing contaminants, and breaking emulsions. This coagulation forms flocculants that float to the surface for removal. These floating sludge layer can be easily skimmed off by deployment of our Enhanced Dissolve Air Flotation (DAF). Optionally the entire sludge slurry can be fed to either a plate and frame type Filter Press or a Dewatering Screw Press.

The final output from our UWTP plant is as good as regular utility water and it can directly be re-used in cooling systems, irrigation, boiler requirement among other uses. Our cutting-edge, 'off-the-shelf' modular UWTPs are tailored to end-user requirements to offer environmentally friendly, legislation-compliant solutions that are simple to install, easy to operate and economical to maintain. The unique design of our reactor have no internal mechanical moving parts apart from pumps which mean the plant requires minimal maintenance and supervision, making it easy to run. Boson Alchemies is diligent in ensuring our customers' sites are environmentally compliant and that the right level of protection is in place.

## Derived Efficiencies

Parameters	INLET to UWTP	OUTLET from UWTP
pH	6.50 - 8.50	6.50 - 8.50
BOD <sub>ppm</sub>	< 800	< 10
COD <sub>ppm</sub>	< 2500	< 20
TSS <sub>ppm</sub>	< 500	< 10
Oil & Grease <sub>ppm</sub>	< 50	< 1
Ammoniacal Nitrogen <sub>ppm</sub>	< 50	< 1
TBC <sub>cfu</sub>	< 10 <sup>6</sup>	< 100

## Benefits and Advantages

Outlined below are some notable advantages of incorporating Boson Alchemies modular Water Treatment Plants (WTPs) in Utility Water Treatment:

- Keep OPEX low and Operating Efficiencies High
- Simplest, Easiest, Ultra-Compact and Lowest Cost of Treatment for Utility Wastewater (up to 2500 ppm COD)
- Removes any Dust, Silica and Fine Particulate matter
- Inhibits Micro-Organisms growth and Biofouling
- Reduces Hardness & Turbidity by over 60% and 90% respectively

- Enables on-site treatment without necessitating treatment in the ETP
- Removes any Heavy Metals / Metallic impurities
- Reduces ORP levels to maintain low rate of scaling and fouling
- Reduces Dissolved Gases, Odour and Colour in the water stream if any
- Effectively Reduces Corrosion and Scaling in Downstream Equipment / Longer Life
- Removal of Organic & Inorganic Complexes and Bio-Polymers
- Maintain High Water Efficiencies and Increased Performance of Cooling Towers & Boilers

## Capacities & Models

WTPs are fully modular and skid mounted units requiring an ultra-low footprint. Our typical 5000 LPH capacity requires 3 m X 6 m footprint on the floor. Module capacities range from 1000 LPH upto 10000 LPH. All modules are standard designs, pre-fabricated, assembled, pre-wired at our workshop and delivered at your sites.

Boson Alchemies Wastewater Treatment Plants (WTPs) are renowned for their effectiveness in addressing the issue of recycling and reusing utility water. By implementing Boson Alchemies WTPs, it's possible to reduce the burden on Effluent Treatment Plants (ETPs) that typically handle utility water.

### About Us

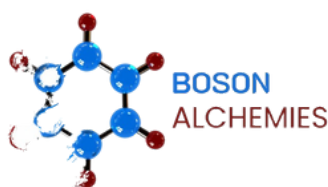
Boson Alchemies as the name implicates- technologies and advancements of the future. We are ex-industry stalwarts with the purpose and vision of bringing specialized knowledge, value added products, services and solutions to you which will help your businesses grow and be profitable & sustainable.

Many of our process technologies are a result of Innovation, Process Development, Research and Strategic Technology Tie-ups with International Companies with R&D facilities having core expertise in the subject field. We have associations with many industry leading solutions and service providers to provide and end-to-end and seamless delivery for your needs.

### Why Us

Having already supported over 120+ customers long term, we specialize in what we do. All our core capabilities, products and solutions are backed by our own knowledge and are developed inhouse and hence we are not dependent on any vendor or service provider to commit and deliver.

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