

## Why Do I need Reverse Osmosis?

### What is TDS?

Total Dissolved Solids, commonly referred to as "TDS", is the measure of a broad array of chemical contaminants (primarily minerals) dissolved in water. Some examples of dissolved solids found in freshwater are; chloride, sulfate, iron, silica and sodium and the most commonly known dissolved minerals which play a heavy role in scale formation, calcium and magnesium.

### What is Scale Formation?

Hardness or limescale is a common and expensive water related problem in many different foodservice equipment applications. It's the result of hardness minerals (primarily calcium and magnesium carbonate or bicarbonate) precipitating out of the solution as a hard rock like deposit over time. Heating, cooling, pressure, and evaporation all act as catalysts to expedite this process.

- It's important to note that there are two types of hardness, they are generally classified as temporary hardness (calcium carbonate or magnesium hydroxide) and permanent hardness (calcium sulfate, chloride or nitrate).
- Both types of hardness can precipitate out as scale, temporary hardness is less soluble so it precipitates out of the solution much easier than permanent hardness and can be removed with acid-based chemical cleaning. Permanent hardness is much harder to remove once it forms as scale.



### What is Chloride Corrosion?

High chloride levels in water can cause pitting and crevice corrosion in stainless steel. This occurs as a result of the breakdown of the protective passive film on the surface of the metal. As chloride concentrates within the pits and crevices, it lowers the pH resulting in extreme corrosion. This is especially problematic with equipment in hot-water applications. Chloride is difficult to remove from water.



## So... Let's Get Rid of It!

There are various ways to remove or inhibit scale from forming in equipment, but some methods of removal have drawbacks and most inhibitor technologies don't actually remove dissolved solids from water. Let's take a quick look at some commonly used technologies and see what drawbacks each has.

### Water Softening (Ion Exchange)

Removes calcium and magnesium ions from water in exchange for sodium ions. The amount of sodium added with 'softened' water is about the same as the amount of calcium and magnesium removed. So, water that has high levels of hardness will have high sodium content when softened. Lower levels of hardness will have less sodium. Water Softening does not remove chloride, silica, sulfate or sodium.

### WAC Resin (Weak Acid Cation Exchange Resin)

WAC resin removes cations (calcium and magnesium) and converts associated alkalinity (carbonate, bicarbonate, and hydroxide) when PH shifts. This means WAC resin only removes temporary hardness, not permanent hardness. WAC Resin does not remove chloride, silica, sulfate or sodium. WAC resin also causes PH levels to vary, often resulting in corrosive water, PH will vary depending on the degree of exhaustion of the resin. When used in an area with high chloride content this low PH environment can lead to extremely corrosive water.

### Scale Inhibition (Polyphosphate, TAC Resin)

Technology that interferes with the formation of hardness compounds inhibiting scale accumulation. Only affects temporary hardness (calcium carbonate or magnesium hydroxide). Scale Inhibition does not remove any ion content (TDS), this includes; calcium, magnesium, chloride, silica sulfate and sodium.



**OP70CR/10**  
Part # 164-01110

### RO (Reverse Osmosis)

Reverse Osmosis is a near absolute removal process that takes out virtually all TDS, this includes; hardness, chloride, sulfate, silica and sodium. It's common for RO systems to remove TDS, but do nothing to manage the mineral- characteristics of product water which will result in aggressive corrosive water. RO systems need to be sized for the applications they need to provide water for. RO systems use water to flush concentrated dissolved content from the membrane. Too much water usage can be wasteful, not enough can disrupt business with system downtime. **RO is the only cost-effective option for reliably lowering total dissolved solids like; chloride, silica, sulfate and sodium.**



**BWS1500/300HF**  
Part # 164-15580



## THE OPTIPURE WAY

### Optimized Water

- All OptiPure RO systems are designed to create optimized water, where water from the RO system is chemically formulated by dissolving a balance of minerals into the RO water and allowing further blending to the desired TDS level. This enhances water for use with beverage applications, such as coffee and espresso, greatly reduces the scale forming and corrosive tendencies of water with equipment; including combi and steam ovens.

### We've Done the Math

- OptiPure application recommendations are based on our knowledge and experience that comes from decades working closely with commercial foodservice operators and equipment manufacturers.

### Nothing's Wasted

- All RO systems use water to cleanse the membrane. OptiPure systems are designed to use just enough water to support the membranes useful life and the consistent performance needed to provide optimized water to your equipment.

### Call your OPTIPURE Dealer to order:

In most cases, needed water quality can be obtained from your utility bill. When they do not, OptiPure offers a detailed "In-House" water analysis. H2O Test Express Kit provides water quality information to help you select the best OptiPure solution for your equipment.

### H2O Test Express Kit Part # 180-80180

