

HOW IT WORKS

Example of severe scale



CHC CONTROLS SCALE

Did you know just 1/32" of scale can reduce energy efficiency by 30%? In cooling water applications, as water temperature increases calcium will drop out of solution to form scale on heat transfer surfaces. Chemical treatments attempt to keep calcium ions in solution to prevent this calcite scale from forming, which drives up energy consumption and costs. CHC treatment increases the pH of the recirculating water, making calcium carbonate (CaCO3) insoluble. As bubbles form and collapse in the CHC treatment chamber, kinetic energy and localized temperature drive calcium carbonate from solution to form non-sticking CaCO3 solids. These solids attract dissolved calcium and carbonate ions, and are then filtered from the water stream.

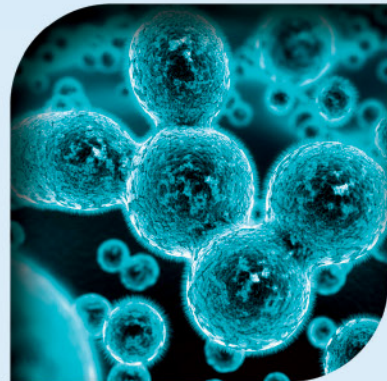
Example of severe corrosion



CHC CONTROLS CORROSION

Within the colliding water streams in a CHC chamber, a region of strong vacuum (27.5-29.5" Hg) forms which strips dissolved CO2 from the water and helps maintain pH in an alkaline environment. Corrosive chemicals typically needed to treat scale and bacteria are not required in a CHC-treated system, which helps maintain an elevated pH. CHC controls bacteria and helps prevent any local corrosion sites due to microbiological activity, commonly referred to as Microbiologically Influenced Corrosion (MIC). CHC keeps equipment surfaces clean by removing solid particles from the cooling water with an integrated filtration system, which comes standard with every CHC water treatment program.

Bacteria under microscope



CHC CONTROLS BACTERIA

The extreme pressures and temperatures created by the Controlled Hydrodynamic Cavitation process physically destroy bacteria and micro biologics. Microbes and bacteria can develop resistance to traditional chemicals, requiring constant adjustment of treatment methodology. There are no such worries with CHC – bacteria cannot mutate or tolerate the physical stress as they pass through the CHC treatment chamber.

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DYNAMIC WATER TECHNOLOGY

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CHC is the global technology leader in Controlled Hydrodynamic Cavitation treatment solutions.

The CHC Solution: CHC Technology offers a proven solution for maximizing equipment operating efficiency, safety and reliability via its multi-patented cooling water treatment system. CHC will also:

- Prevent Scale, Deposition and Microbiological Fouling on Heat-Exchange Surfaces
- Reduce Water and Sewer Expenses
- Conserve Energy
- Stabilize System Operations and Cost
- Extend Equipment Life
- Eliminate Hazardous Chemicals
- Improve Environmental Health and Safety
- Minimize System Maintenance Costs
- Reduce Total Life Cycle Costs

With over 15 years of experience in multiple industries, our controlled hydrodynamic cavitation technology coupled with filtration has proven itself to be the only viable alternative to traditional water treatment methods across the spectrum of water qualities for Refrigeration, Process Cooling, and HVAC applications. The CHC integrated solution effectively controls scale, corrosion, and microbiological fouling while providing a chemical-free water stream to reuse for non-potable water applications. Calculate the savings your cooling system could achieve with CHC by visiting our website at CHCtech.com and click on the "Calculate Savings with CHC" button.

Controlled Hydrodynamic Cavitation

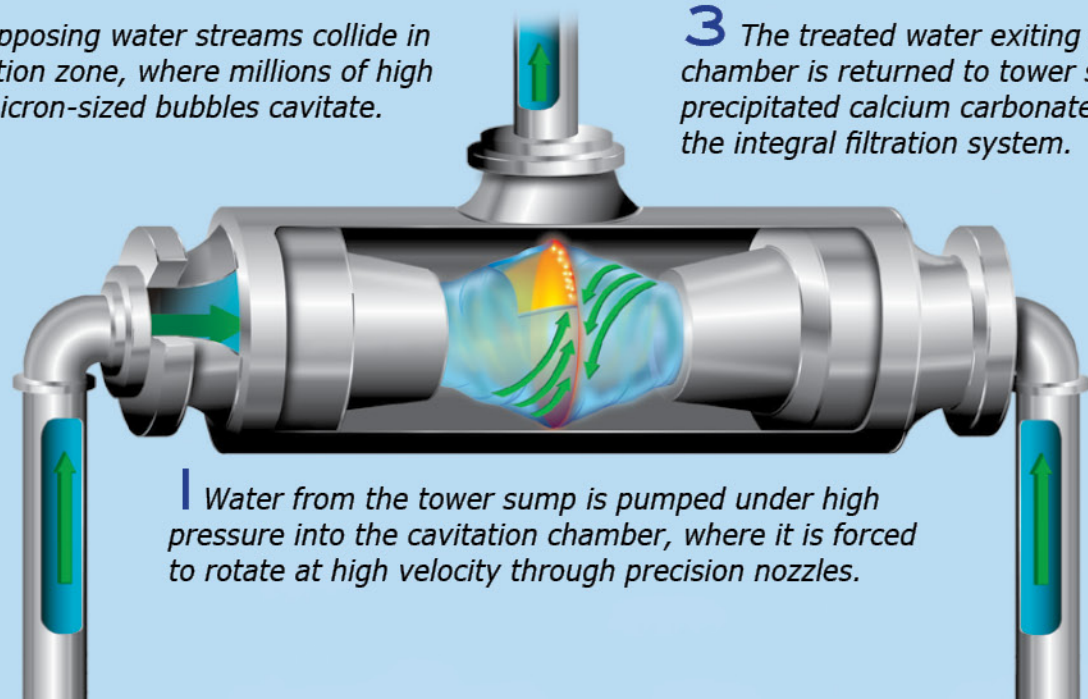
Cavitation is the dynamic formation and collapse of micro bubbles in a fluid. The bubbles collapse through a violent process, creating an acoustic shockwave, visible light, and forcing a shift in the chemical equilibrium of calcium bicarbonate. At the point of total collapse, the temperature of the vapor within the bubble may be several thousand degrees Fahrenheit, and the pressure several hundred atmospheres, releasing enough energy to destroy bacteria.

CHC achieves Controlled Hydrodynamic Cavitation by forcing water through a pair of patented horizontally opposed nozzles. This harnesses the energy of the cavitation process and directs it into the water stream as opposed to material surfaces. It is this controlled energy that is the heart of the CHC solution for scale, fouling and corrosion control.

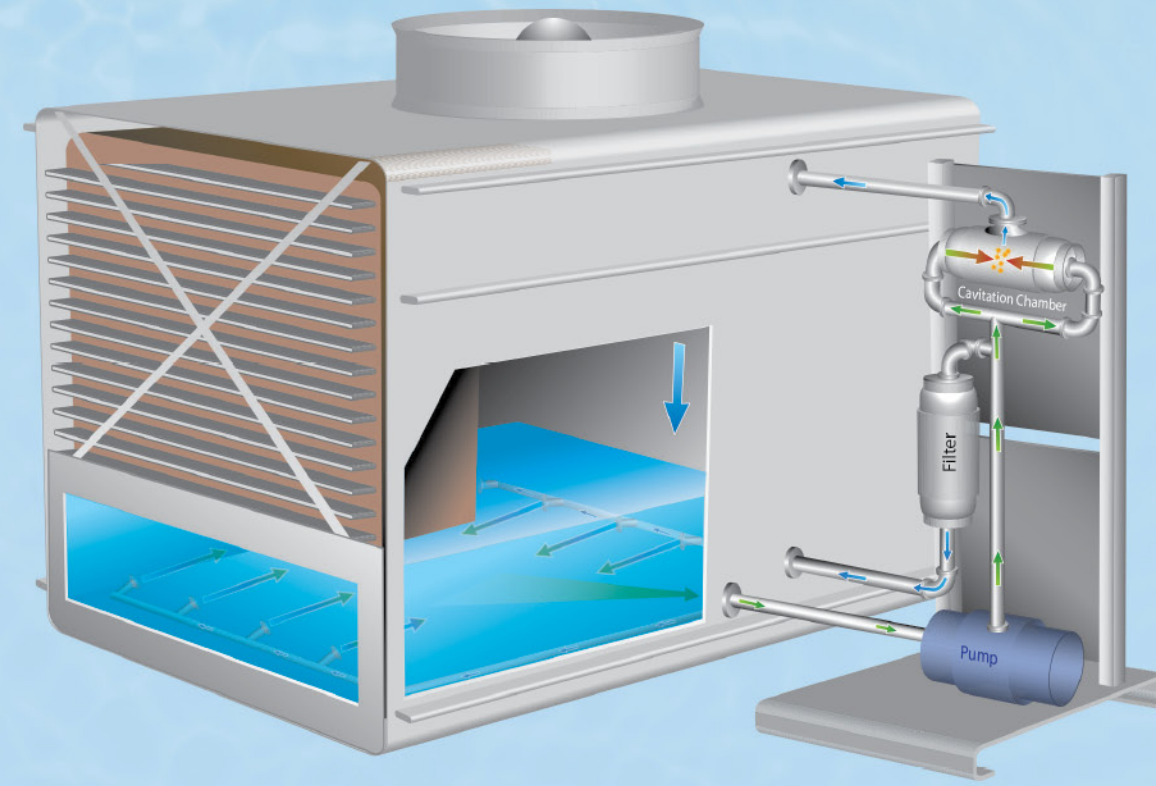
2 The opposing water streams collide in the cavitation zone, where millions of high energy, micron-sized bubbles cavitate.

3 The treated water exiting the cavitation chamber is returned to tower sump where the precipitated calcium carbonate is removed by the integral filtration system.

1 Water from the tower sump is pumped under high pressure into the cavitation chamber, where it is forced to rotate at high velocity through precision nozzles.



A CHC system consists of two side-stream water loops connected into the sump or basin of a cooling tower, evaporative condenser, air washer, or fluid cooler. In one loop, water is passed through the CHC treatment chamber and returned into the cooling system basin or sump. Filtration from the second side-stream removes precipitated calcium carbonate along with other debris that can cause fouling and contribute to microbiological growth. Our high-efficiency basin sweeping system directs dirt and debris toward the filter intake, maintaining a clean cooling water system.



CHC treatment skid, with integrated filter and tower basin sweepers, installed near evaporative cooling equipment.

Benefits of CHC Integrated Filtration

Every standard CHC system includes integrated filtration featuring a centrifugal separator and automatic screen filter. These filter components efficiently and effectively remove solids created by the CHC Controlled Hydrodynamic Cavitation technology while also removing other ingested debris in the cooling system. The separator removes heavier solids, while the screen filter is designed to remove lighter particles. The filter system is controlled by a proprietary PLC to maximize system performance.

A patented suction manifold and basin sweeper system keeps basins and sumps clean and pool-clear. CHC treated systems exceed potable water turbidity standards. The suction manifold is designed to maximize debris removal and minimize ingestion into pump intakes. The basin sweeper system is configured with patented CHC algorithms, and eductor nozzles use a unique venturi design to increase the sweeping flow beyond the driving flow for each nozzle. This results in basin cleaning systems that are very effective while only requiring a fraction of the horsepower of other basin sweeper systems.



CHC primary filtration component, a centrifugal separator



CHC secondary filtration component, an automatic screen filter