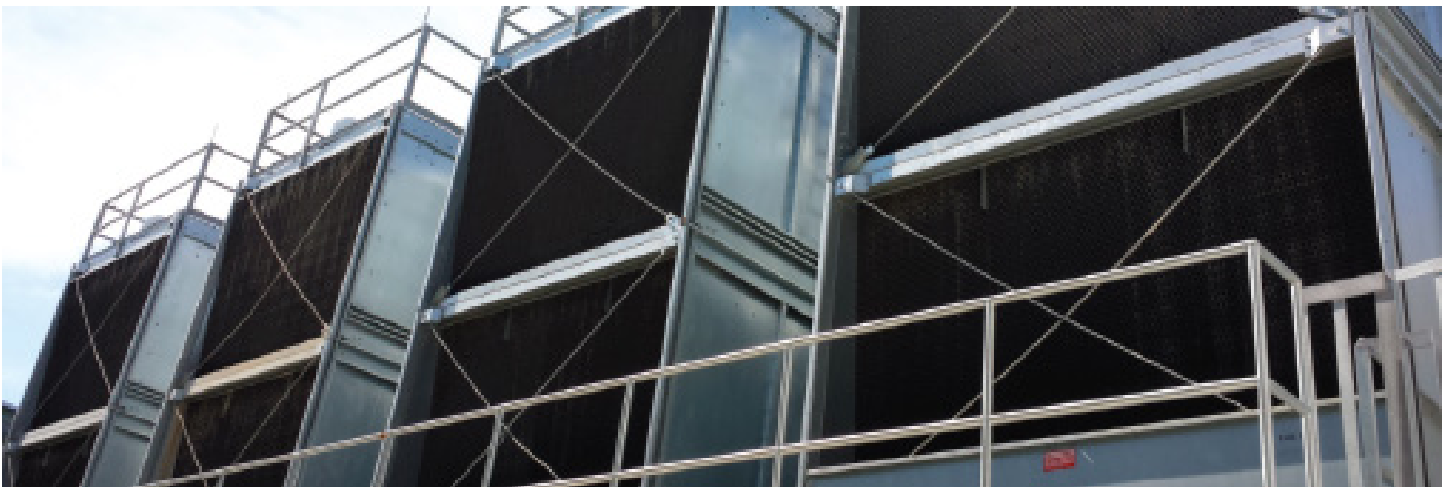


HVAC COOLING SYSTEMS

Best Practices for Evaporative Cooling System Start-Up

Many HVAC evaporative cooling systems are idle or off throughout the winter months, and are often drained to prevent freezing. These extended shutdowns provide excellent conditions for deposits to form and bacteria to grow. When starting up the system for cooling operation, some basic steps should be completed to ensure peak mechanical performance, and to verify that best practices for Legionella prevention are in place. Each cooling tower manufacturer may also have its own seasonal preventative maintenance requirements for mechanical components such as fans and controls. These will be specific to each cooling tower and should be followed along with your regular start-up procedure.



While this brochure deals with best practices for starting up your system, end-of-season care is also important. Refer to our brochure “HVAC Cooling Systems: Best Practices for Tower and Chiller End-of-Season Care” for more information.

Evaporative cooling system start-up can be described in five steps. These steps incorporate information from various guidelines including: ASHRAE Guideline 12, Cooling Tower Institute Guideline WTB-148, and Association of Water Technologies (AWT) 2003 Update and Statement. If starting up from an un-drained system, additional measures may be required to prevent creation of aerosol spray from formerly stagnant cooling water. Contact your representative for further information.



Step 1: Physical Cleaning

1. Visually inspect all wet areas of the cooling tower and clean where accessible (water basin, spray nozzles, etc.).
2. Inspect permanent filter housings and clean or replace media if required.
3. Keep written records of work performed.

Step 2: Fill the System

1. Fill the cooling water system with water and initiate pumps for circulation, with system fans off.
2. Ensure water circulates through all piping and heat exchangers.
3. Place any filtration units online.
4. Re-inspect spray nozzles and wet decks and remove debris that may have accumulated since initiating circulation.
5. Repeat as necessary during the initial operation period; frequency will vary system to system.

Step 3: Water Quality

1. Consult your water treatment specialist. Water treatment control equipment such as automated pumps, meters, sensors, and valves should be inspected, calibrated, and functional.
2. Perform a sanitization of the cooling tower(s) using an oxidizing biocide and bio-dispersant. Follow a written procedure from your building water management plan or use a sanitization kit such as **AquaAnalytics DK-12000**.
3. After completing sanitization and confirming that water quality is within normal operating levels, turn on system fans.
4. Document completion of this procedure in your log books or building water management plan.

Step 4: Begin Operation

1. Utilize a load responsive water treatment program designed to minimize corrosion, prevent deposits and fouling and control biological activity.
2. Employ an adequately sized filtration system to maintain recirculating water particulate size below 10 microns for cooling tower and 5 microns for chilled water loops.
3. Ensure that systems utilizing multiple cooling towers, chillers, or heat exchangers are rotated frequently. This ensures that biocides contact all wetted areas regularly, minimizing biological growth. Frequency of rotation will depend on system design.
4. Document rotation in the log books or building water management plan.
5. Take steps to prevent equipment from sitting idle for long periods of time, as stagnation can lead to deposits, fouling, and bacterial growth.

Step 5: Validation

1. Legionella testing can be used for validation. Take a sample of water from the water basin or flow to spray nozzles for Legionella culture analysis.
2. Document testing results in your log books or building water management plan.
3. Keep detailed records of water quality throughout the season.
4. To confirm proper system operation, additional Legionella culture samples may be completed depending on the requirements of your building water management plan, or in accordance with local laws.