

SCALING RESEARCH LEADS TO COOLING TOWER TREATMENT REFORMULATIONS

Each winter is a time for building engineers to inspect the “tubes” in the chillers as part of the annual maintenance program for their cooling tower systems. We were alerted this past winter that some of them had developed an apparent scale, so we spent several months researching the type of scale and possible causes. Scaling is what proper water-treatment is supposed to prevent, so this became a high priority to solve before the next cooling season.

Using several of our best labs and technicians, we determined most of the apparent scaling was phosphate based, occurring primarily in and around Washington, D.C. This took a lot of detective work to narrow the source and cause to a particular chemical in a limited area. It was based on samples we had analyzed from throughout our service region, from the Eastern Shore of Maryland to and beyond Dulles Airport and the growing suburbs of Northern Virginia. We then learned that the water coming from certain reservoirs had been pre-treated by the Washington D.C. Water Authority with a new phosphate chemical added to it. Perhaps this was a result of their highly-publicized lead problems from the year before. Whatever the reason, many of our customers were now using make-up water in cooling towers that had 4 ppm combined phosphates already added at the treatment plant, so with our protective chemicals also containing phosphates, the total amount of phosphates in some systems was “overloaded” and began precipitating as a phosphate scale. Fortunately, phosphate scale is relatively easy to remove, so with a thorough annual cleaning, the cooling systems were ready for another season.

We have responded to this issue by a slight reformulation in our cooling tower treatment chemical, CTSM-2. We enlisted the best minds in the water treatment industry, and made sure this reformulation didn't reduce the overall protection that we've always provided. Now it gives the additional assurance that, even when make-up water is pre treated with phosphate, the cooling towers will still be protected to our high standard. We also learned during this research that some customers try to save money by running their systems extra cycles before adding make-up water. This practice increases the chances that the remaining water, after much evaporation in the towers, may contain excessive amounts of calcium carbonate, which will also begin to precipitate and form scale. This can be controlled by closely monitoring conductivity levels, by adding make-up water to keep these below the maximum level recommended by your water treatment specialist. Evaporative coolers need to be operated at even fewer cycles because of their propensity to keep the water at higher temperatures that are conducive to causing scale precipitation. We welcome your inquiries to arc@arcwater.com or call us at 800-832-3260 Installation of an inexpensive totalizing water meter in the makeup line will provide early detection. We welcome your inquiries to arc@arcwater.com or call us at 800-832-3260.