COOL UNDER PRESSURE:
winning the war on corrosion in data centre cooling systems

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In data centre cooling systems, corrosion not only weakens metal surfaces but also produces debris that can clog equipment and alter water chemistry. Cortec® Corporation proposes a proactive corrosion-protection strategy during both system operation and seasonal layup.

With the unprecedented rise in cloud-computing and AI, the need for data centres and supercomputers is booming. This astronomical output of artificial brain activity demands enormous amounts of power that quickly convert to heat as these mega-computers process billions of "thoughts" per second[1].

[1] https://biztechmagazine.com/article/2023/08/what-flops-and-how-does-it-help-supercomputer-performance-perfcon#:~:text=FLOPS%20stands%20for%20floating%2Dpoint,speed%2C%20not%20their%20average%20speed.

The natural consequence is the proliferation of giant cooling towers alongside new data centres, with backup chillers kicking in for hot summer months and going idle during cold weather. Whatever the season, taking proactive steps to fight corrosion is critical to maintaining a healthy system long-term. Cortec® Corporation shares insights on why and how to win the battle.

The problem with corrosion in cooling water systems

Preventing corrosion in data centre cooling water systems is not just for looks. Corrosion weakens the metal walls of piping and equipment, creating holes over time, shortening the service life of the cooling system, and increasing downtime for repairs—not to mention the potential for water damage from leaks. In addition, corrosion debris threatens to clog the system or "poison" the water by raising the levels of iron or other metals in the chemistry profile. By avoiding these problems, corrosion prevention can ultimately save significant time, expense, and the headaches that go with them.

Corrosion protection during operation

Although corrosion inhibitors are a standard part of water treatment programs for active chillers or cooling towers, they are sometimes overlooked due to a lack of communication or awareness. If facilities find that a corrosion inhibitor is missing, they can add M-640 L or a similar additive. This "building block" for water treatment formulations offers comprehensive protection thanks to the presence of both contact and Vapor phase Corrosion Inhibitors, which protect metals below and above the water level. It is also an excellent replacement for silicates, phosphates, and nitrite-based compounds where disposal restrictions apply.

Corrosion protection during seasonal layup

Whereas the use of a corrosion inhibitor during operation is the normal practice, preservation of chillers or cooling tower systems that sit idle during cool weather is less widespread than it should be. With their normal water treatment program inactive, these components are also at higher risk of corrosion from residual moisture or condensation as temperatures and humidity fluctuate. Where temperatures stay above freezing, data centres may prefer to keep chillers on standby via wet layup with Cortec's VpCI®-649, a robust corrosion inhibitor package for wet or dry layup. If freezing is a concern, water treatment professionals can drain the water after applying VpCI®-649, or they can apply the Cooling Tower Frog® to an empty chiller. Both treatments include Vapour phase Corrosion Inhibitors that diffuse throughout the void space and form a protective molecular layer on metal surfaces as long as the system remains closed. When temperatures climb high enough to warrant a return to service, the cooling water systems can easily be restarted without having to remove the product first, all while avoiding complications from corrosion during layup.

With cloud-computing and AI only promising to get bigger and place more and more cooling towers and chillers on the horizon, now is the time to equip data centre managers and water treatment service providers with the tools and knowledge they need to minimize corrosion headaches and help data centres "keep their cool" when it comes to corrosion.