

Application Note

Monitoring of Cooling Water Treatment Using Handheld Fluorometer

Background:

Evaporative cooling towers are very popular in a closed-loop cooling system as they provide the most cost effective cooling technology for commercial air conditioning and industrial processes. As the water continues to circulate in the system, scale, corrosion, deposition, and biological fouling will increase overtime, and if left untreated, they can cause substantial problems due to downtime, equipment damage, loss of process control, high water use, environmental violations, safety hazards, and increased energy usage. To reduce such issue, chemical additives/inhibitors are often added to the cooling water system. Although the additives provide many benefits, monitoring and controlling their concentration becomes a different issue. Many methods have been used over the years to control the addition of chemical inhibitor products to cooling systems. Common methods have included manual batch feed, timer controlled feed, constant feed, controlled rate dissolving feeders, simultaneous blowdown and chemical injection (bleed - feed), makeup water proportional feed, and active on-line tracer monitoring. Of these various methods, only active on-line tracer monitoring provides “real-time” control of the actual inhibitor level in the cooling system.

Fluorescence Detection:

PTSA (1, 3, 6, 8-pyrene tetrasulfonic acid tetrasodium salt) tracer dye is a very stable UV dye that provides an excellent choice for the active on-line monitoring of cooling water treatment. It can be excited by UV light around 360nm, and emits fluorescence at around 410nm. It is stable over time, doesn't not react easily with other substances, and environmentally safe. It can be added to the inhibitors at a fixed amount, and once added to the water circulation system, it is readily measured by a fluorometer.

Amisience's handheld fluorometers [model#: **FQ-PTSA-C**] have been proven to detect low level of PTSA (less than 1-ppb) in water samples with proper user calibration. Due to its high portability and low cost, it can be used anywhere in the field to monitor the cooling water system.

