

TECHNICAL TIPS

14 Nov 2005

Parameters measured in colorimetry

The effectiveness of the disinfectants used depends on your system's overall water chemistry, and not just on the disinfectants' concentrations alone. The following section provides a brief overview on the measurement of each parameter:

BROMINE

Bromine is often used as a disinfectant in indoor or covered water systems. Due to lower volatility, bromine is more stable in water than chlorine. Compared to chlorine, the main advantages of bromine are reduced odour, and skin and eye irritation. In addition, bromine remains effective at high temperatures and its disinfecting efficiency is not affected by pH fluctuations. The disadvantages are that bromine is more expensive than chlorine and it cannot be stabilised for outdoor use.

Eutech's C104 colorimeter measures bromine over the range of 0ppm to 13.5ppm.

CHLORINE

Chlorine and chlorine-release compounds are frequently used as disinfectants in swimming pools, drinking water and other water treatment systems. Routine chlorination kills harmful micro-organisms. The disinfection efficiency is a direct function of the level of free chlorine in a system. Total chlorine is the sum of combined and free chlorine.

In applications where there is human contact with the water e.g. in swimming pools and spas, it is essential that the right amount of chlorine is present. Insufficient chlorine will decrease the disinfectant efficiency; while excess chlorine will cause skin and eye irritation and become a health hazard.

Eutech's C401, C301 and C201 colorimeters measure free and total chlorine over the range of 0mg/l to 6mg/l.

CHLORINE DIOXIDE

The use of chlorine dioxide as a disinfectant is seeing growth in many industrial applications. Unlike chlorine, chlorine dioxide remains a true gas dissolved in solution. The lack of any significant reaction of chlorine dioxide with water is partly responsible for its retaining its disinfecting effectiveness over a wide pH range. This property makes it a logical choice for cooling systems operated in the alkaline pH range, or cooling systems with poor pH control. Other applications for chlorine dioxide include the food processing industry; the pulp and paper industries; and the potable water and waste treatment industries.

Eutech's C103 colorimeter measures chlorine dioxide over the range of 0ppm to 11.4ppm.

OZONE

Ozone is one of the strongest and most rapid oxidisers and disinfectants available. Ozone does not require any stabiliser. It does not corrode nor cause scaling. In addition, ozone has no smell, does not cause skin nor eye irritation and does not pose a health hazard. Although more expensive than traditional disinfectants like chlorine and bromine, because it does not cause corrosion nor scaling, the long-term maintenance cost of a water system which uses ozone as a disinfectant may be reduced compared to using chlorine. Ozone is gaining popularity in top spas

and certain swimming pools.

Eutech's C105 colorimeter measures ozone over the range of 1.4ppm to 4.1ppm.

CYANURIC ACID

In applications where chlorine is used for disinfection, cyanuric acid is often present as a chlorine stabiliser. Low levels of cyanuric acid are beneficial as they prevent wastage of free chlorine by the sun's UV rays. High levels of cyanuric acid cause the chlorine to take a longer time to kill the micro-organisms. It is important to test your water sample to determine how much cyanuric acid should be added to maximise chlorine efficiency.

Eutech's C401 and C102 colorimeters measure cyanuric acid over the range of 5ppm to 90 ppm.

pH

The pH value affects the amount of free chlorine that is formed, and therefore determines the effectiveness of chlorine as a disinfectant. As pH increases, the disinfecting power of chlorine decreases. High pH causes scaling of water surfaces, pipework and fittings; this may result in cloudy water. Low pH can corrode metals in pipework and fittings; this may cause metal oxides to stain water surfaces.

Eutech's C401, C301 and C101 colorimeters measure pH over the range of 5.9 – 8.2.