Quat Disinfectant PPMs

By Mark Warner

If you want to investigate the disinfectant even further, you can determine its parts-per-million (ppm) of active ingredients. In a modern "Quat" disinfectant, the Quaternary Ammonium compounds are listed on the label with their ingredient percentage. Parts-per-million can be calculated using a simple formula.

The formula is as follows:

(% of all Quats) x (ounce per gallon dilution rate) / 128 (ounces in a gallon) x 10,000 = Quat PPM

EXAMPLE: A 2 Oz/Gallon Disinfectant Concentrate With 3.85% Total Quat -
(3.85 x 2) / 128 (x 10,000) = 601 PPM

The Environmental Protection Agency (EPA) registers disinfectants as effective in killing the pathogens or disease-causing microorganisms listed on the label only when used at or above the registered PPM. A quat disinfectant must be above 300 - 350 PPMs to be considered effective. It's no longer considered to be an effective disinfectant at levels below 300 PPM. A sanitizer is considered effective at levels of 200-300 PPM. At levels lower than 200 PPM, it could be considered to be an anti-microbial product at best.

As the soil load (or water hardness increases), the PPM will decrease. Quats can lose some active PPMs when exposed to cotton or other disposable wiper materials, as well as high microbial soil loads and high water hardness levels. In general, when mop cleaning a floor with a bucket of solution, every 300 square foot that is mop cleaned will reduce the active PPM in the mop bucket by 150. In other words, every square foot mop cleaned/disinfected will reduce the disinfectant solution's PPM by .5 PPM.

All this is the reason why good disinfectant concentrates are built to have an adequate safety margin to allow for high microbial soil loads or extremely hard water conditions. Many are built to provide a solution at 600-700 PPM prior to use.

Consider this example…

Mopping an average hospital patient room with a solution that is 600 PPM. An average hospital patient room is about 300 square feet. Mop cleaning one room would cause the PPM to drop from 600 PPM to 450 PPM. Still adequate for moving on to the second patient room. Mop cleaning the second patient room would cause the PPM to drop to about 300 PPM, which is just

barely at the threshold of being qualified as a disinfectant yet just enough to use to mop clean and disinfect the third patient room.

After cleaning and disinfecting the third patient room, the solution in the bucket is spent. It no longer contains enough active PPM to be considered a disinfectant or a sanitizer.

You can check the disinfectant solution using Quat check test papers or Quat drop test kits. The Quat check papers are not very accurate, usually only to within 100 ppm. The Quat drop test kits are much more precise, some kits are accurate to within 10 ppm. Any disinfectant solution that does not match the registered numbers can not be assumed to be effective in killing any of the pathogens or disease-causing microorganisms listed on the label.