

Hi-Tech Solutions

CIMR[®] Hydrogen Peroxide Safety

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Continuous Infectious Microbial Reduction (CIMR[®]) Overview

CIMR[®] Infection Control Technology continuously disinfects viruses, bacteria, mold and other fungi by producing 0.02 ppm or .000002% of hydrogen peroxide gas from oxygen and water vapor in the air. At the heart of the CIMR[®] process is a Photo Catalytic process that produces a gaseous Hydrogen Peroxide. The technology is effective against microbes both in the air and on surfaces because the hydrogen peroxide molecules have both localized positive and negative charges; they are literally drawn to viruses and bacteria by electro-static attraction, it works by creating 0.02 parts per million (ppm) of hydrogen peroxide gas from the oxygen and humidity already in the air. The hydrogen peroxide gas is then supplied to the areas where it diffuses everywhere that air travels, disinfecting microbes in places that other technologies can't even reach (CIMR Tech, 2018).

Hydrogen Peroxide Levels as a Naturally Occurring Chemical

Hydrogen peroxide (H₂O₂) is a naturally occurring chemical and in a gaseous state considered a key component of lower atmospheric photochemical reactions. Samples of H₂O₂ extracted from the atmosphere (specific location not stated) have been reported ranging from 0.18 ppm to .005 ppm (IARC 1985). H₂O₂ concentration samples retrieved in the Los Angeles atmosphere were reported to range from 0.000001 ppm to .007 ppm (Sakugawa et al., 1992).

Hydrogen Peroxide as a Disinfectant

The Guideline for Disinfection and Sterilization in Healthcare Facilities, published in 2008 by the Center for Disease Control (CDC), has supported proven methods for cleaning, disinfection and sterilization in a healthcare environment using hydrogen peroxide. Using hydrogen peroxide gas plasma as a cleaning agent is a new method that has recently been added to the guideline (Center for Disease Control, 2008). When it comes to using H₂O₂ as an algicide, fungicide, and bactericide, 1% per application has been deemed safe to use. The Environmental Protection Agency (EPA) states that H₂O₂ has low toxicity and rapid degradation, which means that there is no concern for cumulative effects of H₂O₂ with other substances due to a common mechanism of action (Environmental Protection Agency, 2000). According to the Green Schools Initiative, H₂O₂ is one of the few disinfectants and sanitizers that has been registered through the EPA and the California Disease Prevention Registry (CA DPR) as a safe cleaning agent. H₂O₂ has been recommended as a cleaning agent in schools against all others since it does not contribute to asthma (The Green Schools Initiative and the Green Purchasing Institute, 2019).

Hydrogen Peroxide in the Workplace and in Homes

According to New Jersey Department of Health's Hazardous Substance Fact Sheet, the Occupational Health and Safety Association (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the American Conference of Governmental Industrial Hygienists (ACGIH) all have confirmed that 1 ppm of H₂O₂ is the maximum safe amount for human exposure per 8 to 10 hour work shifts (New Jersey Department of Health, 2016). 3 to 9% of H₂O₂ is also commonly found in households from medicinal use and products such as hair and clothes bleach (Agency for Toxic Substances and Disease Registry, 2002).

CIMR ® H₂O₂ Application

CIMR ® differentiates itself from its competitors by not only reducing air pollution, but reduces surface contamination as well, even in hard-to-reach surfaces. As stated in the overview, CIMR ® only utilizes .02 ppm, which is substantially low compared to the approved 1 ppm OSHA, NIOSH and ACGIH standard. The way CIMR ® is able to disinfect the air is that it produces the .02 ppm of H₂O₂ molecules from oxygen and humidity already present in the atmosphere. The H₂O₂ is then delivered throughout the environment, disinfecting and sanitizing the indoor air, including hard-to-reach places. The way the contaminants are eliminated by the H₂O₂ electrostatic attraction process is that they are broken down safely into oxygen and water vapor (Skalbimas be miltelių, 2018).

References

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