



## Continuous Infectious Microbial Reduction Frequently Asked Questions

### What is CIMR® Infection Control Technology?

CIMR® Infection Control Technology continuously disinfects (while patients, staffs and visitors are present) viruses, bacteria, mold, VOC's and other fungi by producing 0.02 ppm of dry hydrogen peroxide gas from oxygen and humidity that already exists in the air, requiring no consumable supplies and is inexpensive to operate and install. We know of no other technology that is continuous, ozone-free, and safe to use constantly in the presence of humans, animals and other life forms. CIMR is the most comprehensive technology available and oxidizes the smallest known microbes.

### New Technology = New Capabilities

#### Photo-Catalytic Reactor Based

- Produces Hydrogen Peroxide Gas
  - A true gas – not an aqueous vapor!
  - H<sub>2</sub>O<sub>2</sub> produced from water vapor and oxygen already in the air
  - Continuous production of 0.02 ppm
  - Safe! - 1/50th OSHA limit
- Uses Ambient Temp and Humidity

### What is the advantage of using CIMR® Infection Control Technology?

Since CIMR® Infection Control Technology uses gaseous hydrogen peroxide disinfection process it provides aggressive infection control strategies to combat various types of contamination. Additionally, CIMR® Infection Control Technology provides:

- Massive cost avoidance
- Lower cost of prevention
- Lower cost of remediation or sanitization
- Rapid return on investment
- Reduces the risk of spreading or cross contaminating people or building
- Low up-front cost compared to other chemicals and systems
- 24-hour protection
- Stabilization of areas before remediation can begin
- Low maintenance: replace cell or light every 3 years
- Better indoor air quality for workers and clients
- Less absenteeism from workers

## What does CIMR® Infection Control Technology Do?

At the heart of CIMR® Infection Control Technology 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 electrostatic 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 cannot even reach. For example: The gaseous hydrogen peroxide first sanitizes the air ducts, then sanitizes the air and exposed surfaces, and over time diffuses into every crack and crevice that air can penetrate, disinfecting microbes in places that other processes or wipe downs and chemical disinfectants cannot reach. CIMR® Infection Control Technology can inactivate and reduce the viability of microorganisms greater than 95% in as little as 2 hours.

### CIMR® Infection Control Technology provides:

- **Stabilization** - Rapid response by attacking organic viruses, bacteria, and mold (Ex. Lamar University & Spindletop Museum) after catastrophic events
- **Sanitization** - Purifying and eliminating contaminants without major demolition
- **Prevention** - Prevents the reestablishment of mold, bacteria, and viruses  
24-hour protection
- Odorless and eco-friendly

## Who is Using CIMR® Infection Control Technology?

CIMR® Technology's successful implementation is acclaimed by the following:

- University of Pittsburgh Medical Center
- US Military Facilities - Army, Air Force & Navy
- U.S. Army Corps of Engineers
- FEMA (Federal Emergency Management Agency)
- National Historical Society
- Lamar University, Beaumont, TX
- Texas Educational System
- National Insurance Companies

## Is CIMR® Infection Control Technology Safe?

**Yes**, 0.02 ppm of hydrogen peroxide gas is just one fiftieth of the amount that OSHA tells us is safe throughout a standard workday. The hydrogen peroxide gas concentration is also self-controlling. (This was also tested by Dr. Marsden at Kansas State University). If hydrogen peroxide gas increases above 0.02 ppm, it starts reacting with itself until the concentrate drops back down to 0.02 ppm. CIMR® Infection Control Technology Units produces hydrogen peroxide gas that self regulating to .02ppm. Also, when hydrogen peroxide gas reacts with itself, it breaks down into non-toxic oxygen and water vapor. Verified by Dr. Marsden at Kansas State University. The level of Hydrogen Peroxide is one fiftieth of the maximum level allowed by OSHA.

## Okay, How Can Such A Small Amount Possibly Be Effective?

Hydrogen peroxide gas molecules are only 1.25 to 1.5 microns apart. Bacteria are about one micron in size, so they can't move very far without running into several hydrogen peroxide molecules. Viruses can be as small as 0.1 microns, but they will still run into hydrogen peroxide if they move just fifteen times their own length.

The real advantage is that hydrogen peroxide molecules don't simply bump into microbes on a random basis, they are actually attracted to the microbes. Like water, hydrogen peroxide has both localized positive charged points (the hydrogen atoms) and localized negative charged points (the oxygen atoms) on each molecule. So, hydrogen peroxide gas molecules are actually attracted to positive and negative charges on the surface of microbes and are drawn to microbes through the air by electrostatic attraction. The H<sub>2</sub>O<sub>2</sub> is delivered throughout the environment, disinfecting and sanitizing the indoor air, including hard-to-reach places e.g. seen and unseen. CIMR is the most comprehensive and safest technology available to kill and oxidize the smallest know microbes.

## Are You Sure CIMR® Infection Control Technology is Safe for Long Term Use?

**Yes**, as we mentioned above, 0.02 ppm of hydrogen peroxide gas is just one fiftieth of the amount that OSHA tells us is safe throughout a standard workday. Air containing 0.02 ppm of hydrogen peroxide gas is also safer than outside air containing 0.04 ppm to 0.08 ppm ozone, a much stronger oxidizer. As an added benefit hydrogen peroxide gas helps to control the amount of ozone in incoming air.

## Can CIMR® Infection Control Technology Help with High Ozone Levels in Our Air?

If CIMR® Infection Control Technology Units are placed in the air intakes, as air is brought in from outside, hydrogen peroxide gas will react with the ozone to produce oxygen and water vapor, bringing the ozone concentration down to 0.02 ppm in the incoming air.

## What Does the Air Treated By CIMR® Infection Control Technology Smell Like?

It is odorless. At 0.02 ppm, hydrogen peroxide gas is undetectable by the human nose, so CIMR® Infection Control Technology Units do not produce a smell. CIMR® Infection Control Technology will, however, eliminate some smells by disinfecting molds, mildew, and other microbes that produce smells. As smell-producing microbes are disinfecting, they will stop producing new odors, and old odors produced before the disinfection will dissipate over time.

## What Types of CIMR® Infection Control Technology Units Are in Production?

CIMR® Infection Control Technology systems come in a variety of sizes, from units large enough to safeguard up to 80,000 cubic feet, to those small enough for a single room. CIMR® Infection Control Technology can be installed in air intakes, air ducts, in single room heating and cooling units, or purchased in portable stand-alone units.

## I've Heard About Other Hydrogen Peroxide Systems in The Past. Don't They Have Limitations?

There are other hydrogen peroxide disinfection processes available, and they do have limitations compared to CIMR® Infection Control Technology. Other hydrogen peroxide processes vaporize liquid hydrogen peroxide solutions to create a mist of water droplets containing hydrogen peroxide. The hydrogen peroxide mist contains hundreds and sometimes thousands of parts per million of hydrogen peroxide, so they can't be used in occupied spaces. Also, the droplets precipitate out of the air, so they have trouble spreading all the way through a facility. But the biggest disadvantage for these systems is that the hydrogen peroxide in the water droplets is surrounded by water. This insulates the hydrogen peroxide molecules in the droplets and prevents them from being drawn

to microbes in the air or on surfaces by electrostatic attraction. Because CIMR® Infection Control Technology uses oxygen gas and water in gas form to begin with it produces hydrogen peroxide in true gas form. Hydrogen peroxide gas molecules produced by CIMR® Infection Control Technology are not trapped in water droplets and are able to diffuse through the air like any other gas, even into cracks and crevices. Because they are not insulated by water molecules, they can be drawn to microbes by electrostatic attraction. This makes a much, much smaller amount of hydrogen peroxide gas much, much, more effective and lets us provide you with an effective infection control technology that can be safely used in occupied spaces.

### Do You Have Proof? – YES!

CIMR® Infection Control Technology systems have been in the field for years. They have been used in catastrophic events such as Hurricanes Rita, Ike, and Katrina. In all cases, our systems were successful in the Stabilization and Remediation cleanup of the buildings.

Kansas State University and Sandia Labs found that hydrogen peroxide gas technology disinfected 99% of the H5N8 Virus on surfaces within two hours.

Dr. Muto and S. Silvestri of the University of Pittsburgh Medical Center presented results from the use of CIMR® Infection Control Technology systems at the Fifth Decennial International Conference of Healthcare-Associated Infections, March 18-22, 2010.

They concluded:

- CT11 HAI rate was reduced by 48% (8.8 vs 4.6) and the VRE A rate reduced by 56% (9.3 vs 4.1) during the post period, MRSA A rate was unchanged (1.5 vs 1.9).
- VRE A rates were significantly lower in the T vs C unit in the post period and the HAI rate trended towards significance. MRSA A was low in both time periods and in both units.

### Effective at Reducing Microbial Populations on Surfaces

Staphylococcus aureus:	98.5% reduction
MRSA - Staphylococcus aureus (Methycillin Resistant):	99.8% reduction
Escherichia coli:	98.1% reduction
Bacillus spp.:	99.38% reduction
Streptococcus spp.:	96.4% reduction
Pseudomonas aureuginosa:	99.0% reduction
Listeria monocytogenes:	99.75% reduction
Candida albicans:	99.92% reduction
Stachybotrys chartarum:	99.93% reduction
Norovirus:	99.9% reduction