



HEALTH CARE INDUSTRY: HOSPITAL AND MEDICAL EXPERIENCE



CIMR® is a unique and proprietary technology, equipment and product system proven to sanitize indoor air and surfaces, deactivate and eliminate viruses, bacteria, mold, odors, other pathogens, and their odors in a manner that is continuous, proven effective and safe for humans, animals, plants, equipment and the environment.

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HOSPITAL AND MEDICAL FACILITIES

INTRODUCTION

Even prior to the onset of the current COVID 19 Pandemic, the World Health Organization (WHO) stated that poor indoor air quality is the No. 1 cause of death worldwide. One out of 25 people admitted to a health care facility contract a Hospital Acquired Infection (HAI). Hospital Acquired Infections (HAI's) consistently cause over 100,000 deaths with an associated cost of over \$1 billion in the United States.

Methicillin-resistant Staphylococcus aureus (MRSA), a bacterium that causes infections in different parts of the body, Listeria, a genus of bacteria that acts as an intracellular parasite, and a wide range of other Virus, Bacteria, can be very challenging in hospitals and health care facilities, and are increasingly being tracked and reported. This industry is under increasing pressure to have their own Environmental and Safety Governance (ESG) standards and guidelines, which are applicable to many other industries.

In the era of SARS-CoV-2 causing COVID 19 – a significant number of COVID 19 clusters have incurred in long term care facilities, filled with high-risk occupants. Not only has this been a tragic source of fatalities, but it has also brought risk and concerns to health care and other workers and has very sadly prohibited families from visiting loved ones and to be with them in their last hours.

We now know that COVID 19 is predominantly transmitted through aerosolized SARS-CoV-2 virus – often in very small particle sizes – remaining in the air longer and spreading further than previously thought. These challenges are costly; patients have been avoiding medical facilities and many health care workers are concerned about their health and the risk of bringing diseases and infection home to their families.

CIMR® Technology is an Active Air Infusion Pathogen Scavenging Technology that infuses all of the indoor air with a virus and pathogen eliminating, ultra-low level, completely safe hydrogen peroxide (H₂O₂) that permeates wall to wall, floor to ceiling, anywhere air can reach and will sanitize the air, surfaces and any object or item inside the room/space.

CIMR® TECHNOLOGY OVERVIEW

EXAMPLES OF WHO USES CIMR®

Health Care

- Hospitals (including Disaster Recovery Temporary and Field Hospitals)
- Clinics and medical facilities
- Doctor's offices
- Senior care homes and other long term care

United States Government



- United States Military
- FEMA (Federal Emergency Management Agency)
- States and Counties
- United State Department of Homeland Security
- National Historical Society

Educational

- Universities (Lamar University, Beaumont, Texas)
- Houston Baptist University (HBU)
- Texas Educational Systems
- Colleges and schools (USA, Porto Rico and South Africa)
- Day care facilities

Business, retail, and industry

- Entertainment venues
- Corporate offices
- Oil and gas drilling facilities
- Hotel and leisure facilities

Other users

- Shelters
- Food production and processing facilities
- Places of worship and churches
- Homes

SPECIFIC MEDICAL AND HOSPITAL EXPERIENCE

Hospitals and Medical Facilities

- University of Pittsburgh Hospital Medical Center (Emergency Wards)
- Monongahela Valley Hospital
- Jefferson Regional Medical Center
- West Penn Allegheny Health System
- Geisinger Medical Center
- Valley Baptist Medical Center
- Mental Health Hospitals, Texas (MHHT)
 - Port Arthur
 - Orange County
 - Beaumont
- Maxwell US Air Force Base Hospital
- Lakeland US Air Force Base Hospital
- Various other medical facilities and dental offices
- The Ear Institute/Phonak Hearing Systems, Pretoria, South Africa
- HASS Industrial, Pretoria, South Africa.

Note: *CIMR® Technology has been tested and used in temporary medical facilities (including field hospitals and tents).*

ACTIVE AIR INFUSION HYDROGEN PEROXIDE SAFETY AND COMPLIANCE















- At a self-regulating H₂O₂ concentration of .02 PPM. CIMR® is proven safe, compliant with industry guidelines and there is no known oxidizing potential from CIMR® Hydrogen Peroxide.
- The basic science, extensive testing, and real-life applications have confirmed there are no known negative effects on people, pets, plants, medical or other equipment, silk materials, painting, papers, micro-fish, old-films, old documents, maps fine furnishing, sensitive electronics, and metals.
- CIMR® Hydrogen Peroxide deactivates micro-organisms essentially neutralizing their cellular components having no adverse effects.
- CIMR® is self-regulating at 0.02 ppm and will not EVER create dangerous levels of Hydrogen Peroxide.
 - When CIMR® Hydrogen Peroxide molecules get close to each other, they are self-consumed, reverting back into atmospheric oxygen and humidity.
 - CIMR® produced Hydrogen Peroxide is not insulated by water vapor or encased in water, thereby allowing the Hydrogen Peroxide to reach and maintain an equilibrium concentration of 0.02 ppm, despite constant production.



- CIMR® is FDA (Food Drug Administration) compliant.
- CIMR® meets and exceeds EPA (Environmental Protection Agency), OSHA (Occupational Safety and Health Administration), CDC (Center for Disease Control) and the WHO (World Health Organization) Regulations in Air and Surface Disinfection standards.

ACTIVE AIR INFUSION HYDROGEN PEROXIDE TECHNOLOGY TESTING AND VALIDATION

- CIMR® Technology and Equipment have achieved the following certifications, registrations, compliance seals, and stamps of approval:

| | |
|---|---|
|  | CDC (Center for Disease Control) |
|  | FDA (US Food and Drug Administration) |
|  | UL (UL Research Institutes, UL Standards & Engagement and UL Solutions) |
|  | CARB The California Air Resources Board (CARB). |
|  | CE (Conformation to European Standards). |
|  | Energy Star (US Department of Energy/EPA Energy Efficiency) |
|  | EPA (Environmental Protection Agency). |
|  | ETV (Environmental Technology Verification). |
|  | FCC (US Federal Communications Commission). |
|  | GS (German Product Safety). |
|  | Intertek (Zero Ozone). |
|  | PS (US Product Safety Certification). |
|  | RoHS (Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment). |
|  | USTC (United States Testing Company). |

- FDA compliant means systems, machines, units and/or equipment, in the context of the COVID-19 public health emergency, such as sterilizers, disinfectant devices, and air purifiers that can facilitate rapid turnaround of sterilized or disinfected equipment and that help reduce the risk of viral exposure for people to the SARS-CoV-2, based on the current understanding of the Virus.
- CIMR® Technology and Equipment are tested, registered, and verified by regulatory, accredited, and independent authorities, and scientific labs in accordance with national and international standards.
- This ensures compliance with regulations and requirements.
- Extensive testing was performed using established protocols certifying that CIMR® Technology and Equipment is safe and comply with Government regulatory agencies.



MRI Global

(Interval no. 1: Deactivating SARS-CoV-2 Virus from air and surfaces)

- This test found that CIMR® is proven highly effective at deactivating aerosolized SARS-CoV-2 Virus from the air and on surfaces.
- CIMR® Technology and Equipment reduced the viral infectivity relative to the test control by 91.74% continuously during the first 10-minutes of the test while heavy levels of SARS-CoV-2 were continuously injected.
- CIMR® deactivated and eliminated 99.81% within 5 minutes after SARS-CoV-2 injection ceased. These Virus levels have been calculated to replicates a room with an estimated human load of approximately 150 highly infected SARS-CoV-2 positive people.
- The Test also revealed that CIMR® either drops the other particulate out of the air faster or eliminates airborne particles reducing 45% of particulates from the air.

MRI Global

(Interval no. 2: Deactivating SARS-CoV-2 Virus from air and on surfaces even at relatively low humidity levels)

- Based on this testing protocol, CIMR® is effective at deactivating and eliminating aerosolized SARS-CoV-2 virus from the air, even at relatively low humidity levels (average 24%).
- The CIMR® Technology and Equipment reduced viral infectivity relative to control by 78.46%.
- The test result percent log reduction values are calculated based on comparative analysis of viral sample concentrations at each sample time point for Control versus CIMR® Test Device trials.

- The CIMR® Test Device showed similar viral deactivation results at the eleven (11) to twenty one (21) minutes, and twenty two (22) to thirty two (32) minute test time points.
- This can be attributed to a reduction of control sample natural decay viability and a limitation in sample concentration yield at the later test collection time points of the baseline control standard results.
- Theoretically, it can be inferred that the CIMR® Technology would have a greater reduction with increased viral aerosol exposure time which could not be precisely quantified based on experimental limitations.



University of Texas Medical Branch (UTMB)

- CIMR® Technology inactivated airborne SARS-CoV-2 to undetectable levels.
- The results show that, when accounting for the LLD (Lower Level of Detection), the percent reduction in the Virus was ≥ 99.87 to $\geq 99.96\%$; however, since no Virus was detected after using the experimental device, the true percent reduction was likely greater than 99.99% in every case.
- The true net reduction could not be determined due to the LLD of the quantitation assay, but this too was likely greater than 99.99%.



Fort Hood, United States Military Post, Killeen, Texas

- CIMR® Technology Air Purification System, was installed to address the mold, mildew and bacteria as a result of a malfunction in the heating, ventilation and cooling system, water leakage and an outdated building design.
- Both tests were successful in eliminating black mold and mildew growth and demonstrated that CIMR® is an efficient, cost-effective solution.
- The remediated materials of the furniture, such as cloth and mattresses look brand new.
- No other hood process was able to duplicate these results.
- CIMR® saves the Government time, money, equipment and facilities while improving the quality of life.



Lamar University, Beaumont, Texas

- Hurricane Rita caused extensive damage to multiple buildings throughout the Campus.
- Electrical services could only be restored after approximately 7 (seven) days allowing microbial contamination to appear through the area due to the lack of air movement, high humidity, and no temperature controls.
- CIMR® provided an alternative to the conventional cleaning and remediation process: Treating the air to the contaminated services instead of removing the contaminated materials and contents.
- Positive results were noticed immediately.
- Microbial contamination and ‘sick building syndrome’ are no longer a problem.



Spindletop Gladys City Boomtown Museum, Beaumont, Texas

- Another casualty of Hurricane Rita as extensive water damage resulting in microbial contamination.
- A large majority of the contents were delicate and considered ‘one of a kind’ which cannot be easily washed or cleaned. These items included leather goods, lace fabrics, antique paintings, original historic documents, glass and wooden items and items too large or too contaminated to be removed to be cleaned elsewhere.
- CIMR® Equipment were installed in all of the buildings, even though some of the roof, doors, windows and walls were only temporarily repaired.
- Microbial contamination was quickly stabilized, and several buildings passed ‘clearance’ for healthy indoor air quality.
- The artifacts were restored and sanitized with less than one tenth of a percent (.001%) having to be discarded. (Before starting all the remediation companies said nothing could be saved. Only pictures of the artifacts could be taken).
- CIMR® demonstrated that traditional remediation methods would have been more costly, time consuming and resulting in a loss of many ‘one of a kind’ items.



Food Safety Systems Biosecurity Laboratory, LLC., Texas

- CIMR® Technology is effective at reducing populations of Methicillin resistant Staphylococcus aureus (MRSA) and Listeria Monocytogenes (Listeria) on stainless steel surfaces.
- The Hydrogen Peroxide system has the potential to reduce sources of microbial contamination in health care and other indoor air environments.
- This Technology is effective at reducing populations of Methicillin resistant Staphylococcus aureus and Listeria Monocytogenes on stainless steel surfaces.
- The active antimicrobial in the CIMR® System is Vaporized Hydrogen Peroxide.
- CIMR® Systems do not produce measurable levels of ozone.
- Within 2 hours the Virus were reduced by 99.0%
- Within 4 hours the Virus were reduced by 99.7%
- Within 8 hours the Virus were reduced by 99.85%
- Within 24 hours the Virus were reduced by 99.995%.



Kansas State University and Sandia Laboratories, Kansas

- It was found that within 24 hours, 96.4% to 99.9% microbial reduction was noted on surfaces contaminated with Staphylococcus Aureus (Staph), E-Coli (stomach bug), Listeria Monocytogenes (food borne bacteria), Candida Albicans (common fungus), Streptococcus (strep throat virus), and Pseudomonas (infectious bacteria) due to CIMR®.
- Thereafter new microbe reduction was virtually instantaneous.
- CIMR® has the potential to reduce sources of microbial contamination in health care and other indoor air environments.
- CIMR® is effective at reducing populations of Methicillin resistant Staphylococcus Aureus and Listeria Monocytogenes on stainless steel surfaces.
- The active antimicrobial in CIMR® Technology is Vaporized Hydrogen Peroxide.
- CIMR® does not produce any measurable levels of ozone.
- Hydrogen Peroxide Gas Technology disinfected 99% of the H5N8Virus on surfaces within two hours.
- They found that the Hydrogen Peroxide Gas Technology disinfected surfaces contaminated with MRSA (Methicillin Resistant Staphylococcus Aureus), nonresistant Staphylococcus Aureus, E-Coli, Listeria Monocytogenes, Candida

Kansas State University, Manhattan, Sandia Labs, Albuquerque, New Mexico

- The study demonstrated the effectiveness of the CIMR® Cell for the inactivation of Influenza A – (Swine Flu) H1N1.
- After 6 (six) hours of treatment, levels of the H1N1 Virus on inoculated stainless steel coupons were below the detection limit.
- No recovery was observed at 8, 12, or 24 hours.
- This preliminary study indicates that the CIMR® Cell was effective at inactivating Influenza H1N1 Virus on inoculated stainless coupons under the conditions of these tests.
- It was further observed that Hydrogen Peroxide Technology demonstrated the ability to disinfect 96.4% to 99.93% of inactivates and disinfects a broad range of viruses, bacteria, fungus, and mold spores on surfaces within two hours.
- It was also found that within 24 hours, 96.4% to 99.9% microbial reduction was noted of surfaces contaminated with Staphylococcus aureus, E-Coli, Listeria Monocytogenes, Candida Albicans, Streptococcus, and Pseudomonas and thereafter new microbe reduction was virtually instantaneous.
- This study demonstrated microbial reduction on contaminated surfaces by 96.4% to 99.9% within the first twenty-four hours.



RADIL LLC, Columbia, MO

Outcomes of the test confirmed that Murine Norovirus on stainless steel were reduced by 99.9% and on carpet and cloth more than 99.6%.



FDA Compliant Lab Tests

- CIMR® has been proven 99.999% effectiveness rate in FDA compliant lab testing against gram-negative (highly resistant) and gram positive fungal bacterial spore mold.



American Journal of Infection Control

Scientific Journal published by Elsevier on behalf of the Association of Professionals in Infection Control and Epidemiology

- The results of this study demonstrate that Hydrogen Peroxide was effective in reducing the residual microbial bioburden on surfaces and in the air.
- Hydrogen Peroxide demonstrated potent antimicrobial activity against a broad spectrum of micro-organisms, including those most commonly associated with health care-associated infections (HAI), spore-forming organisms, and mycobacteria.
- Hydrogen Peroxide Technology and Equipment are safe when used in any occupied setting and produce Hydrogen Peroxide at far more dilute concentrations than other airborne Hydrogen Peroxide Systems.
- Hydrogen Peroxide demonstrates an effective microbiocidal activity because of its nonaqueous gas state.
- Hydrogen Peroxide Technology and Equipment achieve Hydrogen Peroxide concentrations well below OSHA's (Occupational Safety and Health Administration), safety limit of 1.0 ppm.
- This Technology and Equipment, by contrast, offer a continuous infectious microbial reduction that can address in real-time the ongoing contamination of the health care environment without interrupting patient care.
- Individual exposure to Hydrogen Peroxide showed no negative side effects or adverse reactions during the study.
- Hydrogen Peroxide was effective in reducing surface and air microbial bioburden in an occupied space.



Department of Horticulture

Faculty of Agricultural Sciences, University of Talca, Chile,

Department of Vegetable Production, University of Almería, Spain

- Hydrogen Peroxide easily degrades into oxygen and water.
- Hydrogen peroxide is biodegradable and not harmful to humans, animals and plants.



**The University of Pittsburgh Medical Center
Presbyterian (A 766-bed tertiary care facility), Pittsburg,
Pennsylvania**

- The Health Care Associated Infection (HAI) rate was reduced by 48% and the Vancomycin-resistant Enterococcus (VRE) A rate reduced by 56% during the post period.
- VRE A rates were significantly lower in the in the post period and the HAI rate trended towards significance.
- Methicillin Resistant Staph Aureus A (MRSA A) was low in both time periods.



**University of Cincinnati Center for Health-Related Aerosol Studies, Department of
Environmental Health, Ohio**

- The study concluded that within one hour it could kill 90% of airborne viruses and 70% of airborne bacteria.



Austin ISD (Independent School District), Texas

AUSTIN ISD, TEXAS

The CIMR® 414 Technology proved to be successful beyond anyone's expectations despite the amount of moisture vapor, area exposed to wet soils, temperature variations, car exhaust, etc. in a non-conditioned test area.

- This study proved CIMR® ability to improve and maintain excellent air quality in a harsh non-conditioned environment.



GOLDEN LIVING CENTERS, MILWAUKEE, WISCONSIN

- CIMR® Equipment were installed to reduce the amount of harmful bacterial fungal microbes in the Nursing Home Facility.

- Three tests were performed: The first two a month apart a third one two months later.
- Results for the Airborne and Surface CFU Testing confirmed the following:
 - Greatly reduced or eliminated the bacterial growth
 - Controlled new growth on a continual basis
 - Controlled bacterial growth in humid conditions within the building
 - Controls the particulate levels within the building.

WHAT DOES CIMR® DEACTIVATE AND ELIMINATE

- CIMR® protects against any pathogens...anywhere air can reach indoors.
- It deactivates and eliminates viruses, bacteria, fungi, molds, and their odors and combats the transmission and transference thereof.
- CIMR® inactivates and eliminates the following and more:

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|--|
| Bacillus Subtilis (Common infections) |
| Candida Albicans (Fungi: Thrush and Yeast infections) |
| Escherichia Coli (E-Coli) |
| H5N8 Virus (Influenza A or Bird Flu) |
| Influenzas (General Flu) |
| Listeria Monocytogenes (Listeriosis) |
| Methicillin Resistant Staphylococcus Aureus (MRSA) |
| Norovirus (Common food poisoning - "Stomach bug") |
| Pseudomonas aeruginosa (Pneumonia) |
| SARS-CoV-2 (COVID-19) |
| Streptococcus Lactis (Infective Endocarditis or IE) |
| Various types of molds such as: <ul style="list-style-type: none"> ○ Acremonium ○ Bacillus (Gram negative and Gram positive) ○ Alternaria ○ Aspergillus ○ Aureobasidium ○ Chaetomium ○ Cladosporium ○ Fusarium ○ Mucor ○ Penicillium ○ Smuts/Myxomycetes/Periconia ○ Stachybotrys Chartarum (Black Mold) ○ Synecphalastrum ○ Trichoderma ○ Ulocladium |

