



Hospital Dynamic Sanitization

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Current Sterilization Methods

Many technologies and chemicals disinfect medical environments with 6-log kill rates but require manual labor and/or evacuation of all occupants.

We do **not** sterilize environments.

Hospital Dynamic Sanitization

Our technologies provide safe and affordable methods to actively neutralize airborne and surface based contaminants 24/7 **while occupied**

Constant Sanitization

Simply plugging in one of our room Air Sanitizers can achieve significant 24/7 reductions of airborne AND surface based viruses and bacteria.

Versatile product options scalable from the smallest room to the largest air handler. We have product solutions for any room, building or vehicle. Plug and play options as well as those installed in the HVAC systems.



MERS Surface Kill Rates

MICROBAC labs found Middle East Respiratory Syndrome Coronavirus (MERS) found 99.998% reduction on surfaces after 4 hours. Cytotoxicity control showed no cytotoxicity observed in 4 out of 4 wells

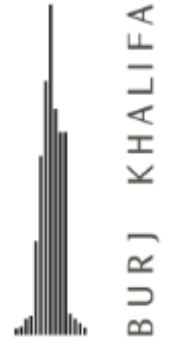
Contact Times	Mean Reduction (3 replicates)
1 hour	99.582%
2 hours	99.984%
4 hours	99.998%

Airborne H1N1

MICROBAC labs found Influenza A Virus (H1N1), strain: A/PR/8/34 titrated by 50% tissue culture infectious dose (TCID50) endpoint assay using MDCK cells. All of the controls met the criteria for a valid test. 99.99% reduction of airborne H1N1 in 20 minutes.


Contact Times	Mean Reduction (3 replicates)
20 minutes	99.99%





Proven Worldwide

15+ years of University & Laboratory Testing, over ten thousand homes, and trusted by globally recognized brands ranging from the tallest building in the world to pro sports teams and hospitals. More than 1 Billion Cubic Feet of air is currently sanitized every hour using Hypoallergenic Air technology.



neutralizes environmental contaminants in real time
while rooms are in use by patients and staff.

Proven Results in Leading Hospitals

Manager Supply Chain, Renowned Texas Hospital

“We deployed the technology to address a mold issue and were very pleased! Since that time we have placed the technology throughout our major downtown facility.”

Head of Infection Control, Large Urban Hospital

“We implemented the technology to address a very serious issue in our Bone Marrow Transplant Facility. After extensive testing we were able to achieve the results we were seeking while avoiding serious potential repercussions.”

Director of Environmental Safety, Regional Medical Center

“The results clearly exceeded our expectations in addressing our initial pathogen, odor issue. We procured the technology in a variety of formats and have satisfactorily installed it throughout the hospital!”



C. difficile Surface Reduction

Benefit: C. Diff disinfection of **surfaces**

Lab Study: EMSL Analytical, the testing company, and the client. The testing was conducted on the proprietary Bi-Polar Technology for its ability to disinfect (kill) bacteria on a solid surface. The testing was conducted in the Cinnaminson Microbiology Laboratory.

Contact Time	C. Difficile Reduction
30 Min	86.87%



Comprehensive Bacterial Reduction

Benefit: dangerous bacteria protection

Lab Study: The Korea Testing and Research Institute conducted a specialized study on the HypoAir technology. They found astounding results.

Contaminant	Reduction
E. Coli	99.9%
S. Typhimurium (salmonella)	99.9%
MRSA	99.9%
L. Monocytogenes (listeria)	99.9%
B. Subtilis	99.9%
P. Aeruginosa	99.9%
S. Aureus	99.9%

Airborne TB Efficacy – M. Terrae Test

Benefit: disinfect airborne bacteria

Lab Study: Mycobacterium terrae (M. terrae) is commonly used as a surrogate test for Mycobacterium tuberculosis. In conclusion, the Bi-Polar Technology was observed to reduce M. terrae by 69.09%. Furthermore, these results demonstrate that the bipolar ionization system tested **does not require direct line of sight** to produce kill rates like ultraviolet light. The bipolar ionization system's kill rates are indicative of those in the entire space.

Contact Times	Mean Reduction (3 replicates)
5 min	33.58%
15 min	39.48%
30 min	57.99%
60 min	69.09%



Comprehensive VOC Reduction Field Study

While maintaining zero ozone levels in the ambient air

Parameter	Unit	NanoHCT-9 Operation period (hour)				Removal efficiency after 3 hour
		0	1	2	3	
Ozone (O ₃)	ppmv	0	0	0	0	N/A
Total Volatile Organic Compounds (TVOC)	ppbv	3600	603	<20	<20	>99%
Total Bacterial Count (TBC)	CFU/m ³	410	120	140	71	82.70%
Formaldehyde (HCHO)	ppmv	6.8	1.6	1.5	0.1	98.50%
Respiratory Suspended Particulates (RSP)	mg/m ³	0.107	0.095	0.072	0.069	35.50%
Ammonia (NH ₃)	ppbv	1200	620	300	320	73.30%
Hydrogen Sulfide (H ₂ S)	ppbv	85	9.9	<2	<2	>97%

The test was performed in an about 2000 ft. sq. warehouse.

Two series of test including :

Control (NanoHCT-9 turn OFF) and

Performance (NanoHCT-9 turn ON)



VRE Surface Reduction

Benefit: VRE disinfection of **surfaces**

Lab Study: The efficacy of the Bi-Polar Technology to disinfect a solid surface against Vancomycin- Resistant *Enterococcus* (*Enterococcus faecium*) was tested.

Extrapolating to 60 minutes, the disinfection rate would be over 99%.

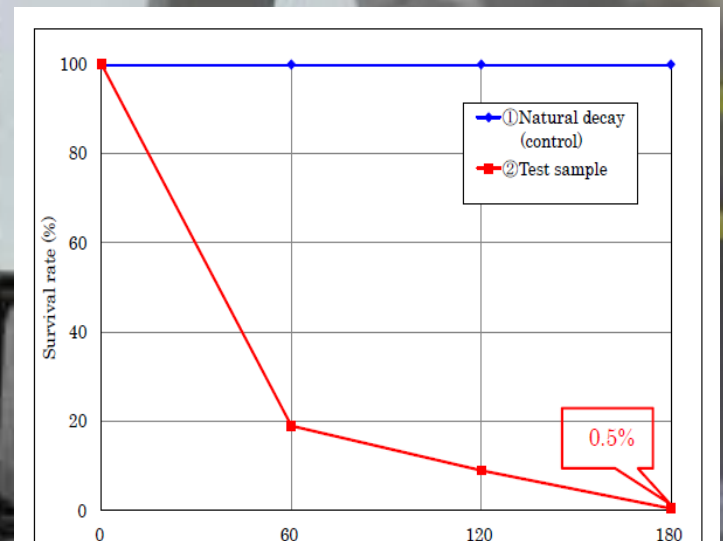
Contact Time	VRE Reduction
1 Min	22.43%
15 Min	43.78%



Virucidal Efficacy

Benefit: airborne virus protection

Lab Study: Kitasato Research Center for Environmental Science in Japan, a renowned source of virus research conducted a study in a 25 m³ room. They found **99.5% reduction** of the airborne virus after just 3 hours.




Current State of the Medical Industry

According to the CDC:

- Approximately **1 out of every 20** hospitalized patients will contract an HAI (2012)
- The conservative cost estimate to the healthcare system of **each** HAI is **\$15,275** (with a standard deviation of \$5,491 in 1998 dollars).
- In 2002, there were an estimated **1.7 million** HAIs.

After the successful implementation of current room cleaning protocols, **results are STILL inadequate.**

- Only 34% of high-touch surfaces are cleaned at terminal clean
- Prior room occupants infected or colonized with MRSA increased the risk of MRSA acquisition of the next occupant by at least 40%
- After cleaning, 71% of VRE occupied rooms and 78% of C. diff occupied rooms still tested positive for VRE or C. diff.
- Even after four rounds of disinfection with bleach, 25% of rooms were still contaminated with MRSA and Acinetobacter baumannii

A photograph of a modern hospital room. In the foreground, a white hospital bed with a beige patterned blanket and a white side table is positioned. To the left of the bed is a purple upholstered chair with wooden armrests. To the right is a light wood cabinet with multiple drawers and doors. In the background, a large window with horizontal blinds offers a view of a city skyline. A medical device is suspended from the ceiling. The room is brightly lit with natural light from the window and recessed ceiling lights.

Don't wait until after an infected patient leaves,
begin proactively sanitizing their room immediately.

New Patient – possible C. Diff

With HypoAir

Portable units can be plugged into rooms with patients identified with possible C. Diff exposure **immediately providing protection and mitigation of further spread**

A single employee can plug units into the wall in every necessary room (less than 1 minute per room) and leave running.

Accessible high touch areas of the room are still manually cleaned *daily*

Current Methods

Accessible high touch areas of the room are manually cleaned *daily*

No airborne protection is typically implemented at all other than dilution with outside fresh air

Surface sterilization methods that require unoccupied rooms (UV Robots/fogging) have **no effect.**

Patient with confirmed C. Diff

With HypoAir

Confirmed patient with C. Diff infection is in their room for on average 4.3 days or longer

During their stay accessible high touch areas of the room are manually cleaned **daily**

HypoAir sanitizes the air and surfaces **24/7** during their stay **minimizing patient, guest, and hospital staff exposure.**

Current Methods

Confirmed patient with C. Diff infection is in their room for on average 4.3 days or longer

During their stay accessible high touch areas of the room are manually cleaned **daily**

Sterilization methods that require unoccupied rooms (UV Robots/fogging) have **no effect.**

Patient discharged from hospital

With HypoAir

HypoAir has sanitized the air and surfaces
24/7 **greatly reducing contamination**

Room is manually cleaned... while HypoAir
continues to sanitize

As needed HypoAir unit(s) may be left in
room for **additional disinfection**. Other
means may be implemented as well.

Current Methods

**Room is potentially highly
contaminated**

Room is manually cleaned

Dedicated employee(s) bring in manual
sterilization methods such as UV robots or
fogging devices. Rooms are isolated
during disinfection process.

HEPA and Carbon Filters:

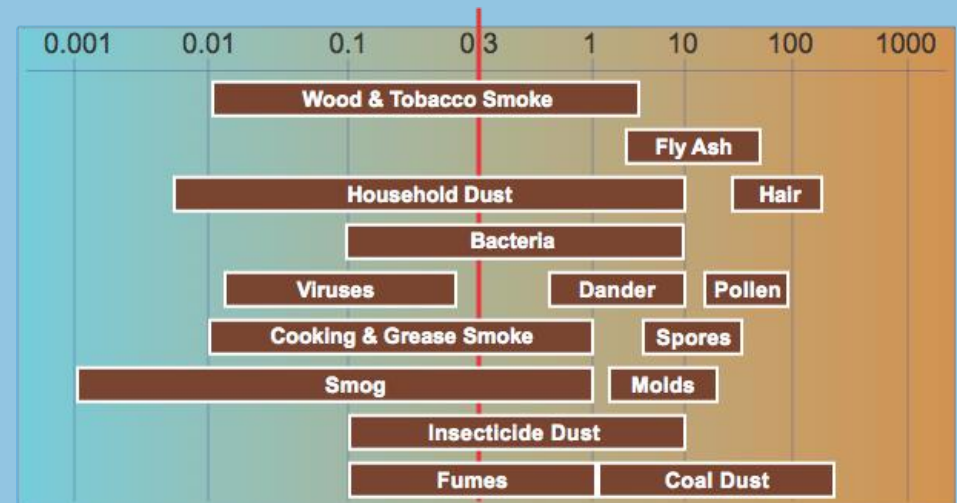
All existing filters are supplemental to our technology. We are able to reduce the costs associated with any current spend on filter replacements including HEPA.

Sources of Filter Cost Savings:

- Reduce the need for outside dirty air
- Reduce the contaminants in recirculated air and frequency of air exchanges.

About HEPA: The Institute of Environmental Sciences and Technology ([link](#)) suggests HEPA filters must capture 99.97% of particulates **.3 microns or larger** (various grades of HEPA). Many contaminants are often MUCH smaller than .3 microns and so HEPA will often have little to no impact on odors, chemical gases, viruses, and many other common contaminants. Carbon Filters are effective against odors but require frequent changes. In addition, they are extremely expensive to maintain requiring frequent replacements. Our technology supplements the existing filtration found in HVAC systems. By utilizing our technology, we are able to provide the broad coverage against the contaminants that HEPA does not affect. In addition, our technology is able to increase the effectiveness of filters (converting fine and ultra-fine particulates into larger particle sizes) as well as reduce the number of filter changes needed resulting in cost savings.

NOT Effective below 0.3 microns





Ice Machine Application

Award winning new self-cleaning tech to
save cost & keep ice machines clean

**National Restaurant Association 2018
Kitchen Innovations Award Winner**





Net Savings from the 1st Day

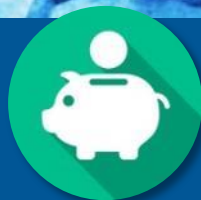
- Easy Installation
- Reduced operating costs
- Safer and better looking ice
- Guaranteed Savings
- 24/7 sanitization of coils
- Reduced cleaning cost
- Elongated ice machine life
- No long term commitments



National Restaurant Association 2018 Kitchen Innovations Award Winner



Net Savings
& long term benefits



Save as you go
Reduce current spending



\$0.50 per day
Rental, no capital outlay



Hypoallergenic
AIR



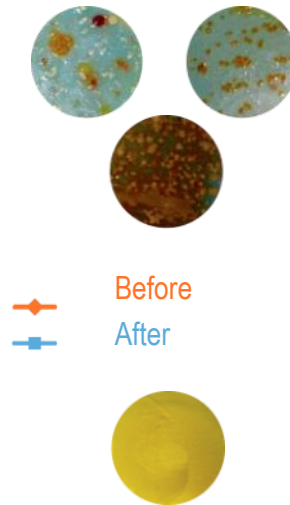
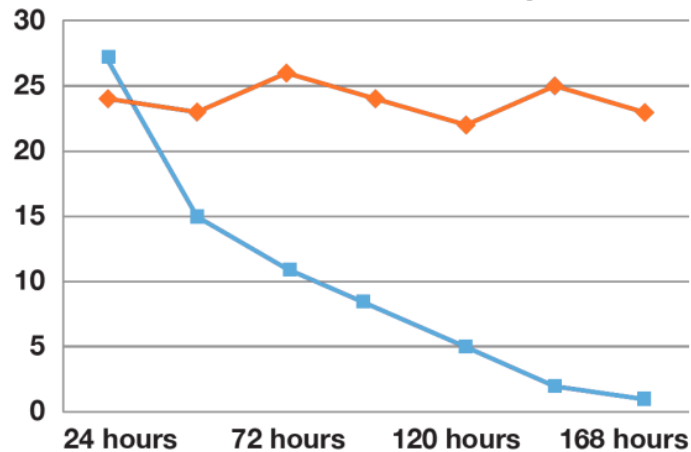
Prevent: Mold, biofilm,
slime, and bacteria growth

Save: Cleaning costs &
elongate equipment life

Protect: Ice quality, taste,
appearance, & reputation.



Microbial Colonies Comparison



Key Equipment Features:

- Small enough to fit into any Ice Machine
- Powerful enough to cover 2,400 CFM
- 110-277 VAC 10 WATTS, UL Listed, NSF Certified
- Zero chemicals, glass, ozone, or mercury.



Reduce risk of Health Violations and fines up to \$500,000

Ice machine sanitizing is governed by Food Law 2009 Chapter 4 part 602.11 and 702.11, which states that the ice contact surfaces must be sanitized after each cleaning. Annex 7 Form 2A section 5 states: Federal law provides under the Criminal Fine Enforcement Act of 1984 for a fine up to \$100,000 for a misdemeanor by a corporation or individual not resulting in death and, for misdemeanors resulting in death, a fine of up to \$250,000 for individuals and \$500,000 for corporations. Robert W. Powitz, Ph.D., M.P.H., R.S., C.F.S.P.