



# ADVANCED OXIDATION TEST RESULTS 2000-2016

**Live & work in a  
virus free environment**

New technology to improve all our worlds



**THE PURE AIR GROUP ARE THE ONLY DISTRIBUTOR FOR RGF PRODUCTS IN THE UK.**

**Bringing new technology to rid us from harmful bugs and bacteria in today's world.**

We are both a maintenance based service and a call out/outbreak service. How many of us have heard these words mentioned in the news? MRSA, e-coli, Norovirus, that occur in Care Homes, Hospitals, Schools, Nurseries, through many sectors like Public transport, Call centers, Food hygiene ratings for all in the hospitality business and even your own home.

**We look forward to working with you to create a better environment.**

Organisations using our service could even save money. How? You ask, well if you did not have to pay for temporary staff because full time staff are off sick this could be a great saving you would make from using this service. Not only does Pure Air Group create a better environment we will ensure you remain complaint to the highest standards expected by the local authorities.

**For your customers and clients' it gives them the peace of mind you really do go that one step further to enhance their experience and create an environment in which to thrive whilst in your facility.**

**Live & work in a virus free environment**

New technology to improve all our worlds

**To find out more about our products and how they can benefit you, visit our website or contact us.**

# ADVANCED OXIDATION TEST RESULTS 2000-2016

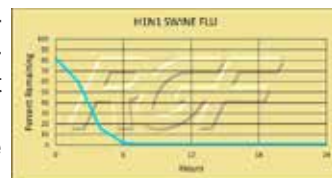
RGF first developed its Advanced Oxidation Technology over 20 years ago. Over one million RGF cells are in use around the world. RGF has licensed its technology to many Fortune 500 companies for use in medical, food, military, residential, commercial, marine, hospitality and government applications. RGF cells in various products have been tested and/or approved or registered by:

- ETL, TUV, EU, CSA
- Chinese Government
- U.S. Government
- U.S. Military
- Japanese Government (TV commercials)
- European Union
- Electric Power Research Institute
- Canadian Government
- USDA & FSIS

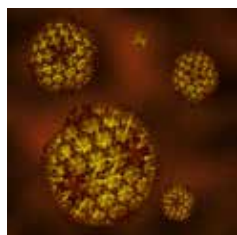
In addition, RGF cells have been specified in the Norovirus & MRSA protection plans of America's largest restaurant chains, hotel chains, theme parks, cruise lines, public schools and hospitals. The following is a summary of some of the testing and studies performed by third party independent labs and universities. RGF products are not medical devices and no medical claims are made.



The **H1N1** flu virus, or swine flu, caused a worldwide pandemic in 2009-2010. It is now considered a seasonal flu, which continues to circulate seasonally worldwide. Spread of the H1N1 virus occurs in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing by people with influenza. Sometimes people may become infected by touching items – such as a surface or object – with flu viruses on it and then touching their mouth or nose. Kansas State University completed preliminary testing on RGF's Photohydroionization® (PHI-Cell®) and Reflective Electromagnetic Energy (REME® Cell) technologies with 99+% inactivation of H1N1 Swine Flu on a stainless steel surface.



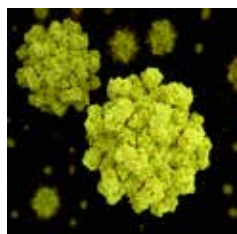
Tested by Kansas State University Inactivation Rate **99+%**



**Avian influenza** is an infection caused by avian (bird) influenza (flu) viruses. Avian influenza is very contagious among birds and can make some domestic birds, including chickens, ducks and turkeys, very sick and kill them. Of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 has had the largest number of detected cases of severe disease and death in humans. Of the human cases associated with the H5N1 outbreaks in poultry and wild birds in Asia, Europe, the Near East and Africa, more than half of those people reported infected with the virus died. Source: CDC: Center for Disease Control and Prevention



Tested by Kansas State University Inactivation Rate **99+%**



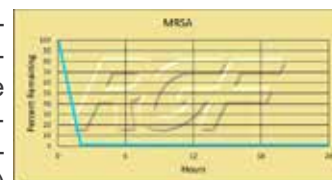
**Norovirus** is a highly contagious virus and as few as 10 viral particles may be sufficient to infect an individual. Infections of the virus can occur by consuming contaminated food or water, by touching contaminated surfaces, or from person-to-person transmission. Norovirus is named after the original strain "Norwalk virus," which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio in 1968. The most common Norovirus outbreak settings include healthcare facilities, restaurants and catered events, on cruise ships and in schools. 50% of all food-borne outbreaks of gastroenteritis can be attributed to norovirus.



Tested by Midwest Research Institute Inactivation Rate **99+%**



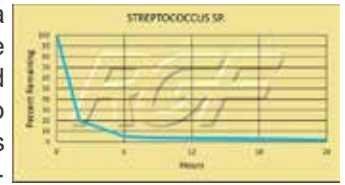
**Methicillin-Resistant Staphylococcus Aureus (MRSA)** is a type of bacterium responsible for difficult to treat infections due to its resistance to certain antibiotics. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin and amoxicillin. Staph infections, including MRSA, occur most frequently among persons in hospitals and healthcare facilities (such as nursing homes and dialysis centers) who have weakened immune systems. In the community, most MRSA infections are skin infections. In medical facilities, MRSA causes life-threatening bloodstream infections, pneumonia and surgical site infections. RGF along with a major hospital participated in a two-year study evaluating PHI technology, which resulted in a 33.4% reduction in infections.



Tested by Kansas State University Inactivation Rate **99+%**



**Streptococcal (strep)** infections are caused by group A streptococcus, a bacterium responsible for a variety of health problems. Most infections are relatively mild illnesses, such as “strep throat”. These bacteria spread through direct contact with mucus from the nose or throat of people who are sick with an infection, or through contact with infected wounds or sores on the skin. Source: U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

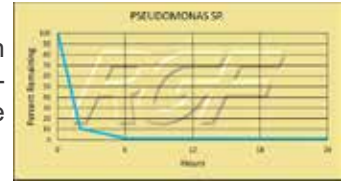


Tested by Kansas State University Inactivation Rate **96+**%



**Pseudomonas Sp.**

The bacterial genus *Pseudomonas* includes plant pathogenic bacteria such as *P. syringae*, the opportunistic human pathogen *P. aeruginosa*, the ubiquitous soil bacterium *P. putida*, and some species that are known to cause spoilage of unpasteurized milk and other dairy products. Source: CDC: Center for Disease Control and Prevention

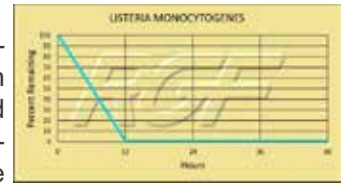


Tested by Kansas State University Inactivation Rate **99+**%



**Listeria Monocytogenes**

*Listeria Monocytogenes* is a bacterium that causes listeriosis. They are commonly found in soil and water. Most human infections follow consumption of contaminated food such as uncooked meats; unpasteurized milk and cheeses, and cooked or processed foods such as ready-to-eat meats. Unlike most bacteria, Listeria is able to grow at refrigerated temperatures. The disease primarily affects older adults, pregnant women, newborns, and adults with weakened immune systems. Source: CDC Centers for Disease Control

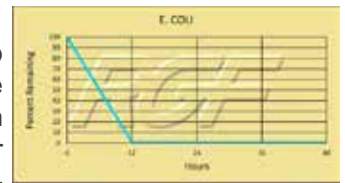


Tested by Kansas State University Inactivation Rate **99+**%



**Escherichia coli**

*Escherichia coli*, usually abbreviated E. coli, are a large and diverse group of bacteria, which are found in in the lower intestines of mammals. Some strains such as enterohaemorrhagic E. coli (EHEC) that are pathogenic can cause severe foodborne illness. Outbreaks are most often linked to raw or undercooked meat products, raw milk, and fecal contamination of vegetables. Source: CDC: Center for Disease Control and Prevention



Tested by Kansas State University Inactivation Rate **99+**%



**Salmonella**

Salmonella is the name of a group of bacteria and is one of the most common causes of food poisoning in the United States. Every year one million people are infected, with more than 19,000 hospitalizations and 380 deaths. Source: Food Safety /CDC Center for Disease Control

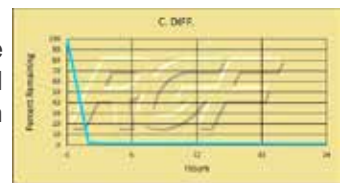


Tested by Kansas State University Inactivation Rate **99+**%



**Clostridium difficile (C-Diff)**

*Clostridium difficile*, also known as C-diff or *C. difficile*, is a gram-positive bacterium that can cause an inflammation known as colitis. It is considered a healthcare-associated infection (HAI). C-Diff infection rates have been on the rise and are becoming more severe and difficult to treat.



Tested by Kansas State University Inactivation Rate **99+**%



**Tuberculosis**

Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*. It typically attacks the lungs, but can also affect other parts of the body. It is spread through the air when people with infection cough, sneeze, or otherwise transmit their saliva through the air. Most infections are asymptomatic and latent, but about one in ten latent infections eventually progresses to active disease which, if left untreated, kills more than 50% of those so infected. Source: Centers for Disease Control

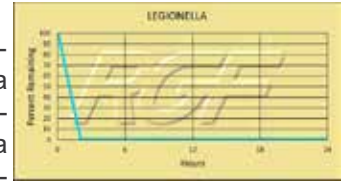


Tested by Kansas State University Inactivation Rate **99+**%



### Legionella

Legionella is a group of pathogenic bacteria that is one of the most frequent causes of waterborne disease in humans. One type of pneumonia caused by Legionella is called legionellosis, or commonly known as Legionnaires' disease. The disease is transmitted when people breathe in a mist or vapor with the bacteria. Source: CDC Centers for Disease Control



Tested on Pan Saver by Kansas State University Inactivation Rate **99+%**



### Streptococcus Pneumoniae

*S. pneumoniae* is an exclusively human pathogen and is spread from person-to-person by respiratory droplets, meaning that transmission generally occurs during coughing or sneezing to others within 6 feet of the carrier. The bacteria can cause many types of illnesses, including meningitis, ear infections, sinus infections, and bacteremia. Health experts estimate that more than 10 million mild infections (throat and skin) like these occur every year. Source: CDC Centers for Disease Control



Tested by Kansas State University Inactivation Rate **99+%**



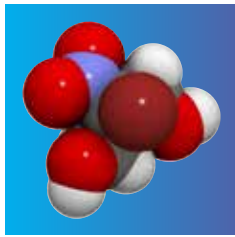
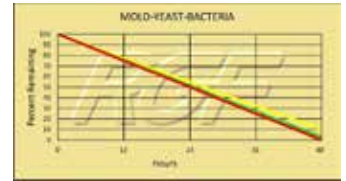
### Bacteria/Mold/Yeast

The purpose of these tests was to evaluate the effect RGF's Advanced Oxidation Technology has on mold, yeast and bacteria (TPC). This test was performed utilizing a standard 2,000 sq. ft. home and 3,000 sq. ft. simulated home.

Reduction %

**Bacteria 99%** **Mold 97-98%** **Yeast 90+%**

Tested by California Microbiology Center



### Chemical Compounds

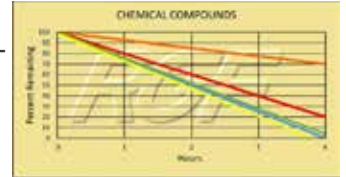
Gas Chromatograph/Mass Spectrometer test performed by Nelap Accredited Lab on airborne chemical compound reduction using RGF's AOT.

Hydrogen Sulfide - Rotten eggs                      Butyl Acetate - Sweet banana  
Methyl mercaptan - Rotten cabbage              Methyl Metharcyline - Plastic  
Carbon Disulfide - Vegetable sulfide

Reduction %

**Hydrogen Sulfide 80%** **Methyl mercaptan 100%** **Carbon Disulfide 30%** **Butyl Acetate 100%** **Methyl Metharcyline 100%**

Tested by GC/MS Nelap Accredited Independent Lab



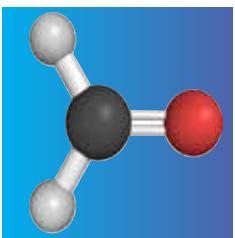
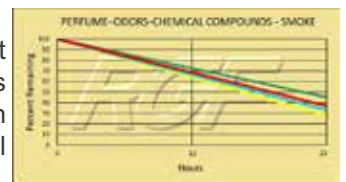
### Odors

The purpose of this test was to evaluate to what effect the RGF's AOT unit has on cleaning chemicals, pet odors, and perfume odors. This test was performed utilizing two 500 cubic foot test chambers and a ten-person odor panel. The qualitative assessments of the ten-person odor panel were then used as a means to determine the odor reduction.

Tested by C&W Engineering (Independent PE Firm)

Reduction %

**Cleaning chemicals 55+%** **Pet odors 72%** **Perfume odors 63+%** **Smoke odors 70%**



### Formaldehyde

Formaldehyde is a colorless, flammable, strong-smelling chemical that is used in building materials and to produce many household products. It is commonly used as an industrial fungicide, germicide and disinfectant. When formaldehyde is present in the air at levels exceeding 0.1 ppm, some people may experience adverse effects including burning sensations in the eyes, nose, and throat, watery eyes, coughing, nausea, as well as skin irritation. The purpose of this test was to evaluate the effect RGF's Advanced Oxidation Technology has on formaldehyde.

Tests by Kansas State University | Formaldehyde levels less than 0.05 ppm in 4 hours



### Suspended Particulate Reduction-REME®

The REME® Cell was evaluated for particulate reduction in a particle test chamber. Particle counts were reduced to ISO Class 4 levels (10,000 – 0.1um) within 12 hours of exposure to the REME® Cell. After 24 hours of treatment, ISO Class 3 levels (1,000 – 0.1um) were achieved. Typical HEPA filtration is effective down to .3um

Tested by Kansas State University Inactivation Rate **99+%**





**Electrical / Ozone / EMF**

All RGF AOP devices have been thoroughly tested for electrical safety, ozone / emf - Electro Magnetic Frequency and have passed Federal Safety Standards. Tested by: TUV, ETL, UL, CSA, NEI China, RGF Labs. The Japanese Government, GSA, and Electrical Power Research Institute. Note: Many household appliances emit some ozone and emf in safe low levels such as fluorescent lights, motors, computers, copy machines, refrigerators, blenders, electronic air filters, air conditioners, electric fans, microwave ovens, etc.

**Sneeze Test - RGF PHI and REME®**

A testing protocol concept was used which included a "Sneeze Simulation Machine" and "Sneeze" chamber. A sneeze can travel at up to 100 mph, so lung capacity, sneeze pressure, and liquid volume had to be taken into consideration to properly simulate a human sneeze. This was accomplished and the test proceeded with outstanding results. An average of 99% reduction of sneeze germs was achieved with PHI/ REME® in a double blind test, at three feet from the sneeze source.



Simulated Sneeze Lab Test at three feet in a 250 cu ft Bio Test Chamber. An independent PE double blind study.

Tested by: Kansas State University, inactivation 99%

**SAFETY**

It is a normal reaction to question the long term safety of any product that is effective and uses new or "breakthrough" technology. This type of question has become common as our litigious society has taught us to question things that significantly outperform existing methods or products.

The RGF *advanced oxidation technologies* that produced the results found on the pages of this report certainly fall into the category of breakthrough technology. This is evident by its outstanding test results across the entire range of microbes.

The breakthrough in the RGF *advanced oxidation technologies* is not found in the final product (hydroperoxides), but rather in the method by which they are produced. The active ingredient created by the RGF products is a group of oxidants known as Hydroperoxides. Hydroperoxides have been a common part of our environment for over 3.5 billion years. Hydroperoxides are created in our atmosphere whenever three components are present: unstable oxygen molecules, water vapor and energy (electro magnetic).

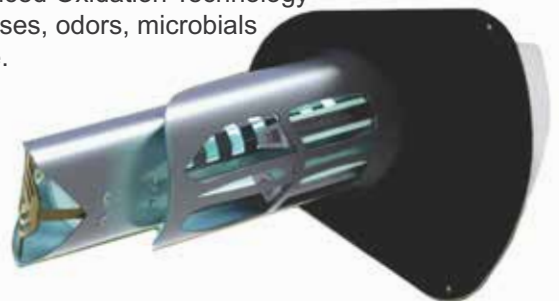
Hydroperoxides are very effective (as demonstrated by the test results in this book) at destroying harmful microbials. As oxidants, they do this by either destroying the microbe through a process known as cell lysing or by changing its molecular structure and rendering it harmless (which is the case in VOC's and odors). The amount of hydroperoxides required to accomplish this task in a conditioned space is well below the level that is constantly in our outside air. The advanced oxidation technology found in RGF's Guardian Air product family has brought the oxidants found in the outside air into the conditioned space of your home, office, business, etc.

There is no known case of hydroperoxides ever creating a health risk. Considering we have been exposed to hydroperoxides in nature since the day man stepped on the planet, it is a reasonable assumption that hydroperoxides do not constitute a health risk. Over the past 20 plus years RGF has more than one million Advanced Oxidation products successfully used worldwide.

RGF Guardian Air QR+ PHI Cell®  
An RGF Advanced Oxidation Technology effective on gases, odors and microbials.



RGF Guardian Air REME HALO®  
An RGF Advanced Oxidation Technology effective on gases, odors, microbials and particulate.



**Disclaimer:**

All the above tests were performed on RGF Advanced Oxidation products with Advanced Oxidation Plasma of less than .02 ppm unless noted otherwise. They were conducted by independent accredited labs and university studies. They were funded and conducted by RGF's major clients to assure third party credibility. RGF products are not medical devices and no medical claims are made.

**RGF Environmental Group, Inc.**

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