



A Comparison of:  
Conventional HVAC Filtration and UV  
and  
EcoQuest International's  
Fresh Air and DuctwoRx Air Purification Systems  
with  
Space Certified RCI Technology



# Conventional HVAC Filtration Systems w/UV

- Passive Systems – Waits for contaminants to pass through filters and past UV.
- Only traps particles 3 microns in size and larger (the majority of particulate in a home is less than 3 microns). This smaller particulate is what causes allergic and asthmatic reactions.
- Only 20% - 30% of indoor air will pass through the system. \*
- Cannot eliminate gases, odors, VOC's, viruses, bacteria, pet dander or tobacco smoke ***in the breathing space.***

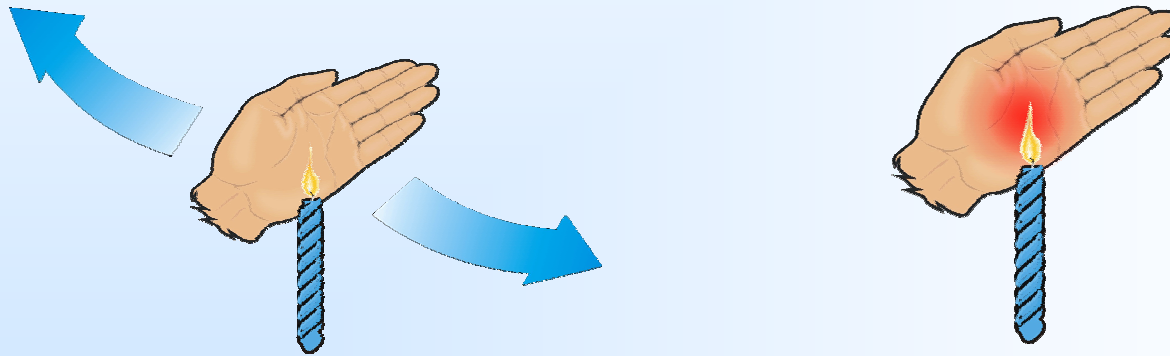
\*Try this experiment. Put a balloon on the floor at the farthest point from a cold air return. Turn on the HVAC fan and see if the balloon migrates toward the cold air return. It won't. So the questions becomes: if the balloon doesn't get drawn to the cold air return how will the particulate get drawn into the system?

ANSWER: It doesn't! It is still in the breathing space.

# UV Ineffectiveness

## Candle Analogy

- If you move your hand over a candle flame rapidly you will feel nothing. The slower you move your hand through the flame you increase the exposure time creating the ability to get burned.



- Mold must be exposed for at least 3 seconds to UV at very close range to kill it. Mold passing by a UV light at a high rate will not be destroyed allowing re-contamination of the breathing space.

# Questions About Mold

What if you had mold growing in the corner of a room?

- ❖ How does the mold get drawn up into the cold air return and into the HVAC system?
- ❖ What if it gets past the filter?
- ❖ Will it be exposed to the UV light long enough to kill it?
- ❖ So what happens? It re-contaminates the breathing space.
- ❖ Then what happens?
- ❖ We have the opportunity to inhale it OR it has a 70% to 80% chance of NOT entering the HVAC system AND the opportunity to begin to grow somewhere in the home!

***So What Is The  
Solution For  
The Pollution?***



- **Active System – Produces:**

- Hydroxyl Radicals –  $\text{OH}^0$
- Super Oxides -  $\text{O}_2^-$
- Hydroperoxides –  $\text{HO}_2^-$
- Ozonide Ions –  $\text{O}_3^-$
- Hydroxides –  $\text{HO}^-$

*All found in nature*



- “**Purifying Plasma**” distributed into breathing space throughout entire home
- Eliminates – odors, viruses, bacteria, microbials, mold, VOC’s **at the source.**
- Drops particulate from the breathing space **at the source**
- **RCI Advanced Oxidation Process**
  - Reacts up to 40 times faster than ozone alone
  - Attacks virtually all organic compounds
  - Provides a redundancy of oxidizers
- Covers a whole home up to 3000 square feet





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- **“Purifying Plasma”** distributed into breathing space throughout entire home using HVAC.
- Eliminates – odors, viruses, bacteria, microbials, mold, VOC’s *at the source.*
- **RCI Advanced Oxidation Process**
  - Reacts up to 40 times faster than ozone alone
  - Attacks virtually all organic compounds
  - Provides a redundancy of oxidizers
- Covers a whole home from 2000 to 3000 square feet
- Works well as an enhancement to the Fresh Air™



**"Built In" RCI Technology**  
**A NEW Product Line**

***DuctWorx***

**Commercial & Residential**

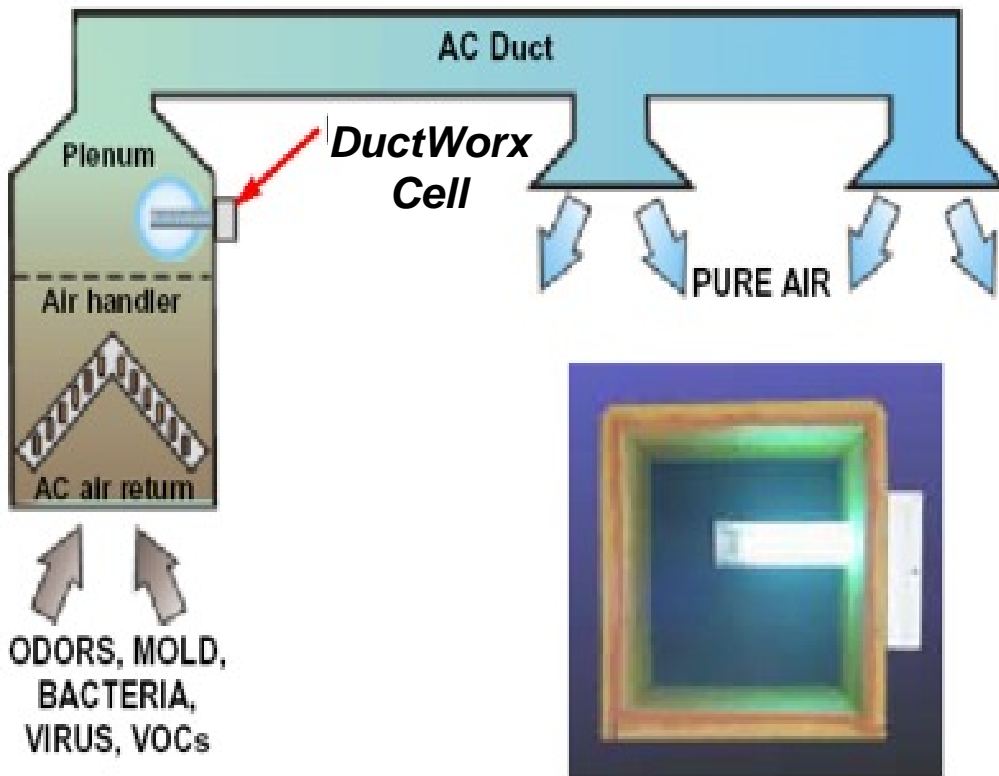
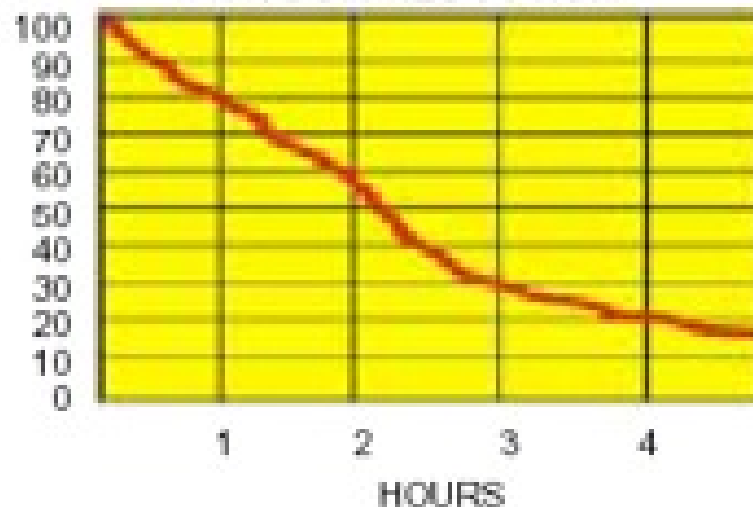
HVAC Air Purification 2,000 – 10,000 SQ FT

*NEW RCI Technology*



Actual lab tests showing up to 90% reductions of airborne bacteria and mold

**% ODOR REDUCTION**



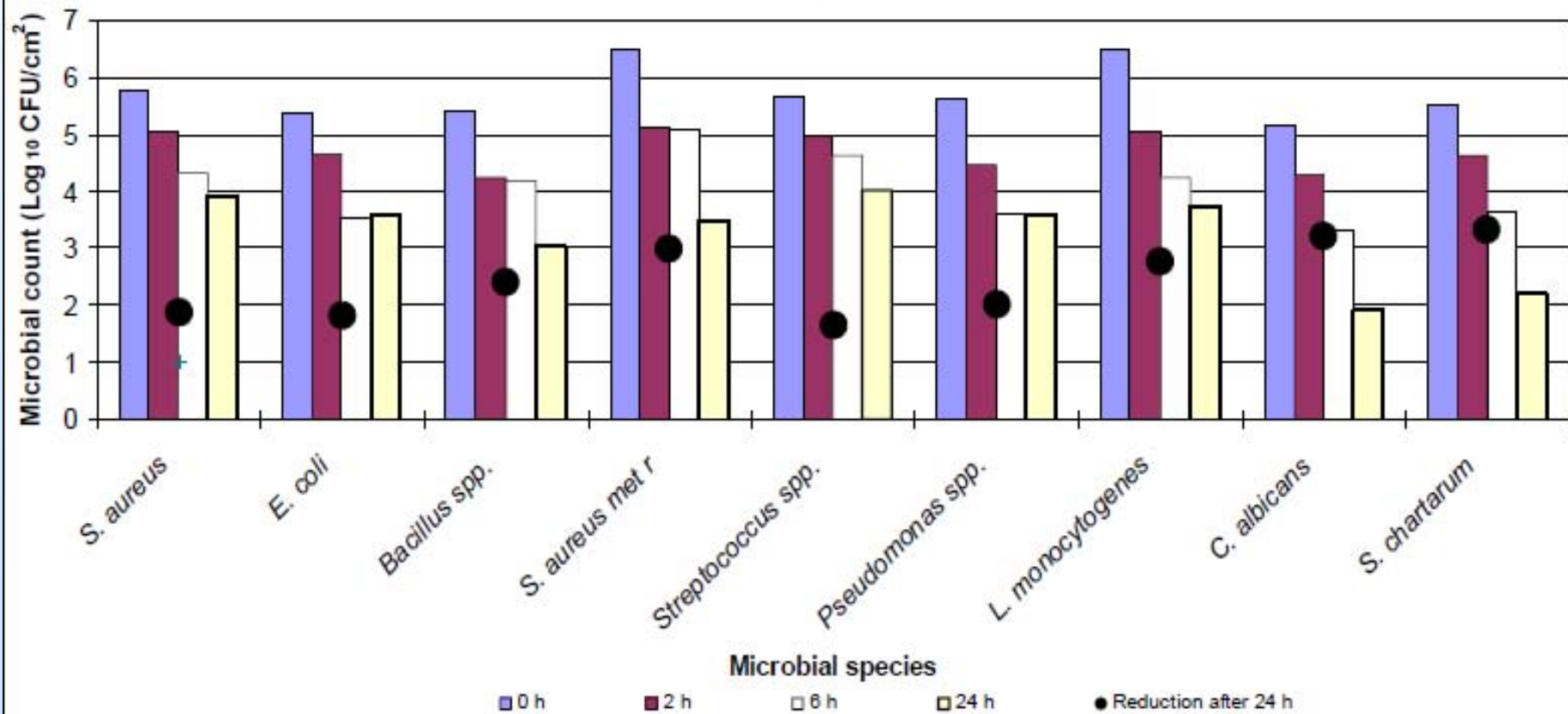


# RCI Probe advantages

- **RCI Probe produces a “Purifying Plasma”.**
- **RCI has been shown to sanitizes up to 99.9% of microbes on surfaces in 24 hour as well as destroy odors.**
- **RCI takes a quantum leap in effectiveness versus UV lights just like air conditioning did for cooling when compared to fans.**
- **RCI probe construction just about eliminates breaking of bulbs. Current UV bulbs can easily break and release mercury.**
- **Bulb life is almost 3 times existing AC UV bulb systems**

# Kansas State University Test Results

Fig. 1 Decontamination of highly polished stainless steel surfaces using the *EcoQuest Radiant Catalytic Ionization Cell*

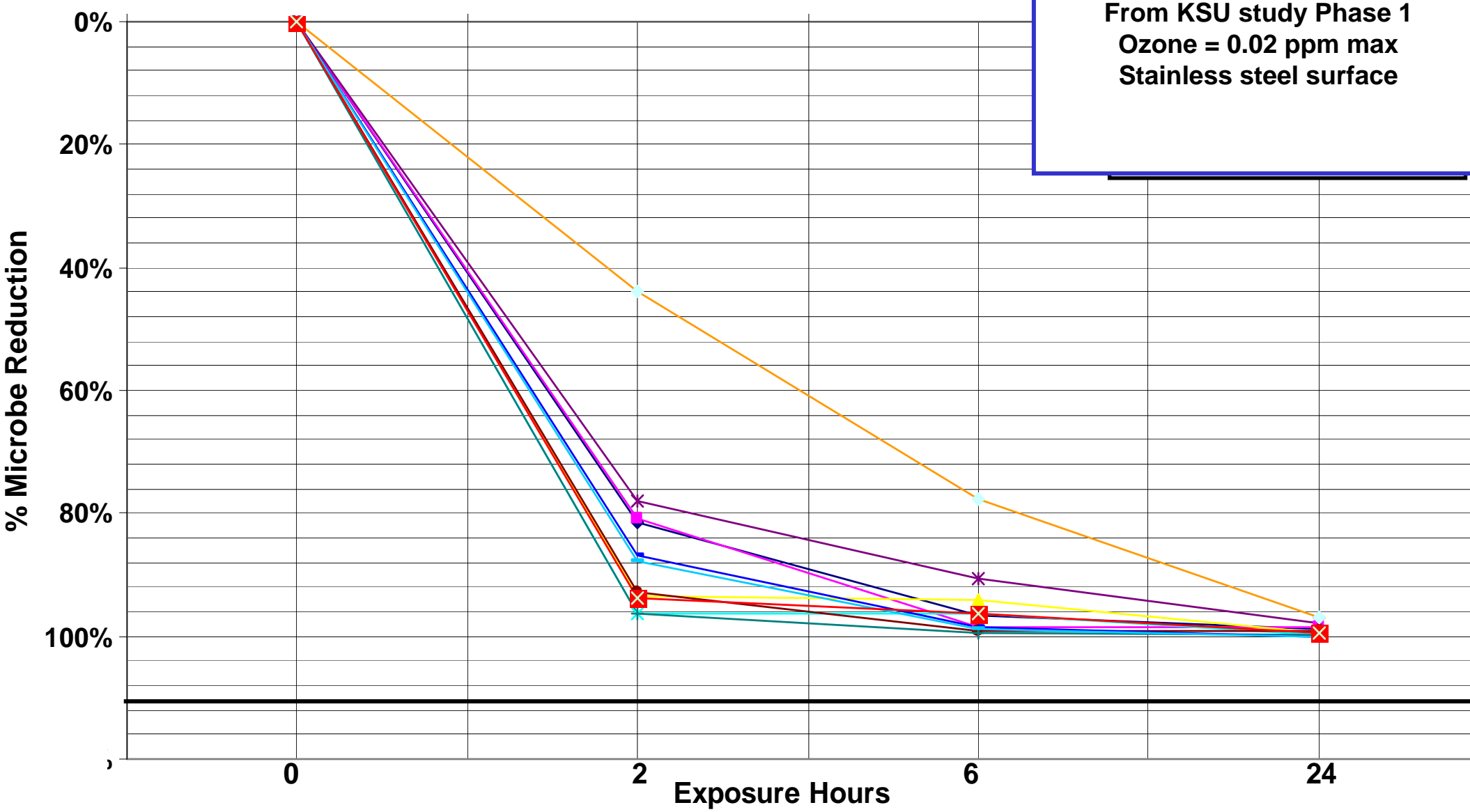


# KSU Microbe Reduction Tests

## Using "RCI & Ozone" Technologies 11-14-05



Prepared by Dave Tupman  
 From KSU study Phase 1  
 Ozone = 0.02 ppm max  
 Stainless steel surface



# EcoQuest Air Purification Systems Installed In Four County Schools

## Professor Says His Research Shows Their Effectiveness

By BILL JONES  
Staff Writer

Technology used in air-purification systems marketed by Greenville-based EcoQuest International also has been shown to be effective in reducing bacterial organisms on stainless-steel surfaces, a Kansas State University professor says in research done.

Dr. James Marsden, regents distinguished professor for food safety and security at Kansas State University, spoke about his research here during an April 17 meeting here that was attended by local government and education leaders and EcoQuest International officials.

The meeting was held in the office of Greene County Mayor Roger Jones and also was attended by Dr. Joe Perkins, Greene County's director of schools, and EcoQuest International President Mike Jackson.

Mayor Jones noted that EcoQuest air-purification systems were donated by the company for use in improving the air inside offices in the Greene County Courthouse that have been affected by flooding in the past.

Dr. Perkins said that EcoQuest air-purification systems, which were donated by the company, are in use in five county schools: Glenwood, Baileyston, Camp Creek and DeBok elementary schools.

"It hasn't cost us anything, except what little electricity the units have used," he said.

Perkins said the movement over recent decades to air-conditioning of schools and, thereby, limit entrance of fresh air, may have contributed to air-quality problems.

"Although we have become more comfortable, we have created an indoor-air-quality problem," Perkins said. "If we can find ways to constantly bring fresh air into our buildings while maintaining comfort levels that we require,

it would be great. That seems to be what this process (EcoQuest technology) is doing."

EcoQuest President Jackson pledged during the meeting to work toward equipping all county schools with EcoQuest air-purification systems.

### ICI Technology

Jackson also said his company had purchased "Radiant Catalytic Ionization (RCI) technology from a Florida firm that developed it for use on the International Space Station.

"Basically what we're doing is bringing nature's power indoors to make a fresher environment," Jackson said.

Dr. Marsden said the RCI technology used in EcoQuest systems does almost the same thing that the Sun does.

"Sunlight is the ultimate purifier," he said, noting that the Sun creates ionization in the Earth's atmosphere. "If you have an event like the eruption of Mt. St. Helens volcano (those dust) particles don't stay in the air forever. Ionization brings the dust/particles back down in a relatively short period of time."

The Sun's ultraviolet light also serves as an anti-microbial agent, Dr. Marsden said.

Similarly, he said, the ultraviolet light technology in the EcoQuest systems converts water vapor, temporarily, into "very aggressive anti-microbial compounds."

The water vapor in the air that passes through EcoQuest systems, he said, is oxidized into hydrogen peroxide vapor, which is "a very effective anti-microbial agent."

After killing infectious agents that it comes in contact with, the hydrogen peroxide vapor generated by the EcoQuest systems reverts back to harmless water and oxygen.

"It's a very natural way to kill bacteria and other infectious agents," Dr. Marsden said.

In the past, he said, homes and buildings were much more open to sunlight and fresh air from the outside.

"Because of energy concerns, we've sealed off our buildings, too," he said.

But EcoQuest's technology can overcome the lack of fresh air inside homes and buildings by clearing the existing air.

"This is a preventative system," he said.

### Viruses Targeted Too

Dr. Marsden said that under laboratory conditions, the EcoQuest systems had been able to eliminate the Norwalk Virus from a metal test surface within 30 minutes.

"We're trying to get the whole family of viruses," he said. "We're in the process of validating each and every virus individually."

Dr. Marsden said the new EcoQuest units don't increase ozone concentrations inside buildings where they are in use.

He added that a major Florida-based entertainment company with which he worked was "very surprised to find out that ozone levels were actually lower with EcoQuest equipment operating in the air-conditioning/dust work."

Asked how that was possible, Dr. Marsden said that while the EcoQuest equipment produces "a small amount of ozone," ultraviolet-light technology used in the units actually decomposes ozone.

"So what it tends to do is regulate the ozone level," he said.

EcoQuest's Jackson said the RCI technology used in EcoQuest systems had been shown to be able to "destroy on surfaces, mold, mildew, bacteria and viruses without having ozone levels go up."

### Goal: Break Infection Cycle

Dr. Marsden said he feels the EcoQuest systems, when combined with "an aggressive hand-washing program" could reduce transmission of many infectious diseases in schools by 99 percent.

The EcoQuest equipment and hand-washing, he said, would help eliminate contamination on desks, chair handles and other surfaces.

"It could break the infection cycle," he said.

An advantage of using the EcoQuest equipment, incorporating RCI technology, is that it remains in operation 24 hours a day, seven days a week, Dr. Marsden said.

That, he said, leads to the

establishment of an equilibrium in the home environment.

Dr. Marsden said that in his own home, he has EcoQuest air-purification systems on each level of the residence.

He noted his studies were presented during the U.S. Department of Agriculture's Food Safety Consortium meeting last fall.

"The paper was published in the proceedings of that meeting, and USDA is doing an article about the technology in their newsletter," Dr. Marsden said.

EcoQuest President Jackson said he had attended a Space Symposium conference last month in Colorado and noticed that RCI technology was featured in a magazine article as having been originally developed by NASA for use on the International Space Station to combat the causes of allergies.

"What happened was that this company in Florida developed it (ICI technology) to a higher level using far rare metals, and we bought that technology and have now brought it into our own technologies," Jackson said. "It's much more advanced than what we sold 10 years ago."

"Now, with the help of the University of Cincinnati and Kansas State University, we're getting the validation studies to show what it does."

### School Use Cited

Jackson said that EcoQuest equipment was donated for use in four Greene County schools.

Dr. Perkins, who's just thrilled to be able to give something back to this community that has given us so much in the form of a good place to work, good workers and a good place to live," Jackson said. "We're looking forward to getting the rest of the schools outfitted with EcoQuest air-purification equipment."

Dr. Perkins replied: "We appreciate it. Anything that you can do to help us make a safer environment for our students, we appreciate."

### Courthouse Use Cited

Greene County Mayor Jones said EcoQuest units that include the RCI technology have been in use for some time at the Greene

County Courthouse, portions of which were affected by flooding in June 2004.

Jones said mold grew in portions of the courthouse after the flooding and was removed by an environmental clean-up firm. Jones said he subsequently contacted EcoQuest's Jackson to see if any of his company's products might help keep the air inside the courthouse clean after the mold was removed.

"Immediately Mike got us in touch with their (EcoQuest's) technical people," Jones said.

EcoQuest technicians subsequently installed air-purification equipment in the courthouses, mostly in its heating, ventilation and air-conditioning ducts, according to Jones.

"It (the EcoQuest equipment) has worked great," Mayor Jones said. "I know some of the employees down there would miss a lot of work in the past because of (previous) respiratory problems."

Jones said the EcoQuest equipment installed at the courthouse apparently had kept mold from growing in the lower level of the courthouse after it was closed up by the environmental firm.

"It was just phenomenal," he said. "With what you have done now, I guess it's been technically proven that it (the EcoQuest equipment) does work. But we've known that it works for a long time here."

Jones also noted that he had

installed an EcoQuest unit in his home because his daughter suffered from allergies and asthma.

"Before we got the unit, I was having to take her to the hospital three or four times a year," he said. "Once we got a unit in our home, that was almost completely eliminated."

The mayor noted that his belief in the effectiveness of the EcoQuest unit was reinforced after he turned it off for a few weeks and his daughter's symptoms returned.

However, EcoQuest President Jackson emphasized that EcoQuest "absolutely makes no health claims" on behalf of its products.

"What we do say is that we can clean the environment," he said. "Healthy, fresh air is better for people than not having healthy, fresh air. We're happy that people get good results, but we don't make any claims about allergies or any health conditions."

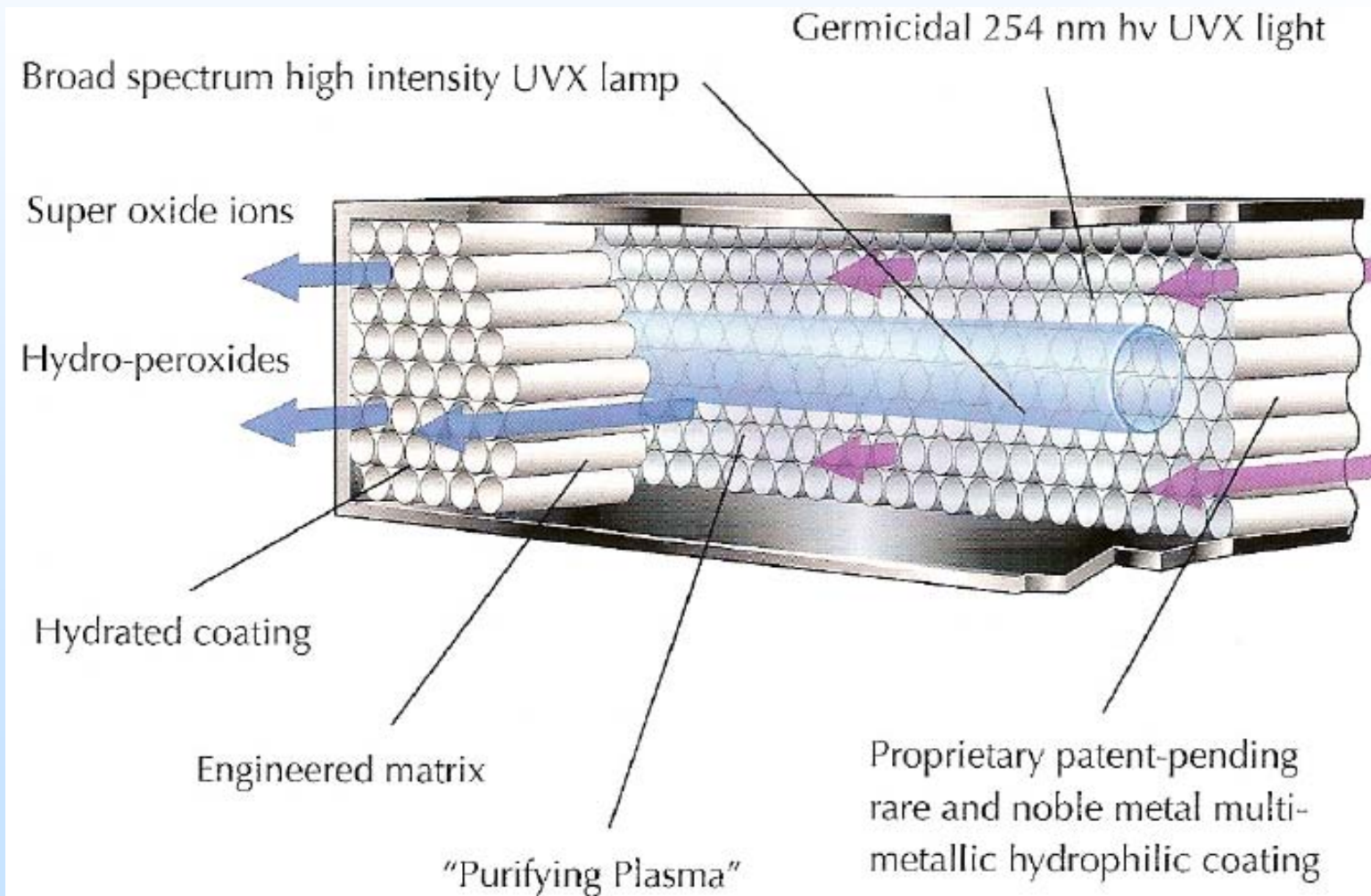
Dr. Marsden said he was aware of similar situations in the business office at Kansas State University, where mold spores had been linked to respiratory illness that affected an employee.

"We cleaned it (mold) up and installed two of those (EcoQuest air-purification) units in the main office area and haven't had a problem since," he said.

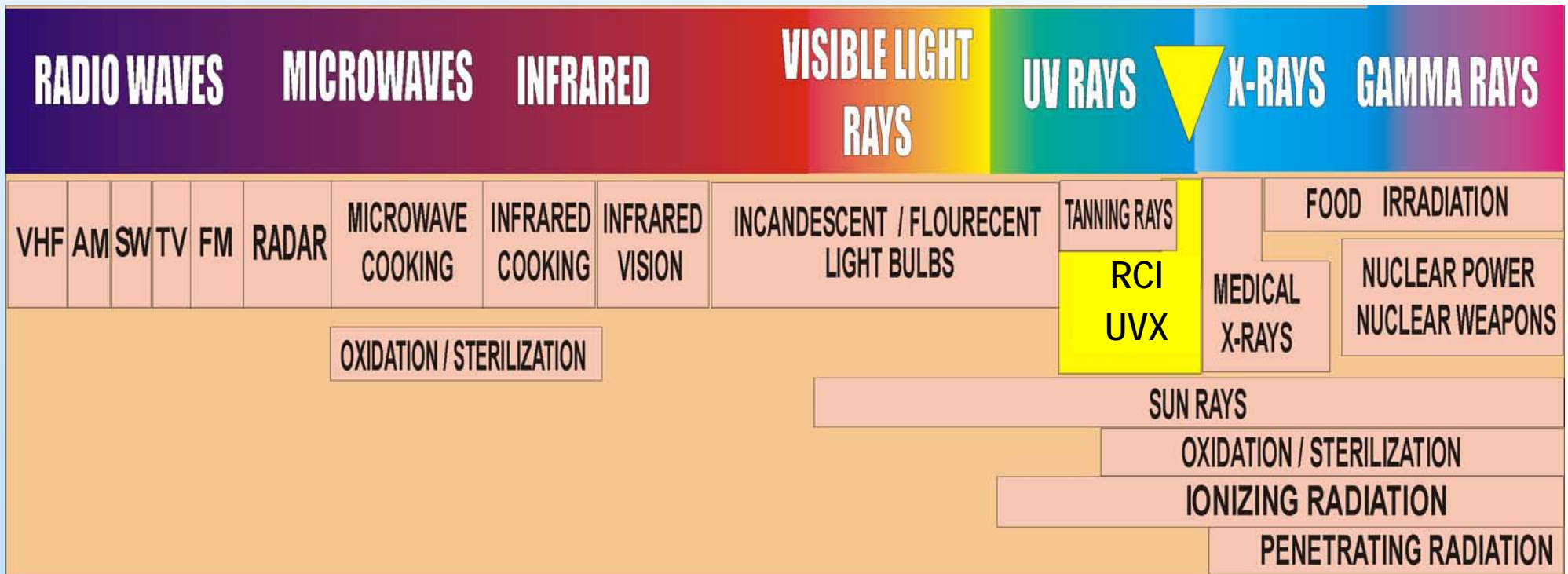
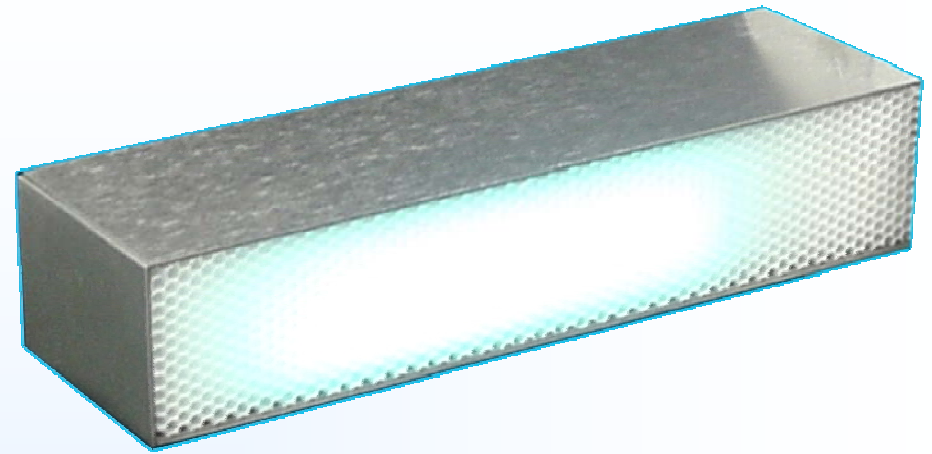
ECOQUEST INTERNATIONAL



# The Next Generation

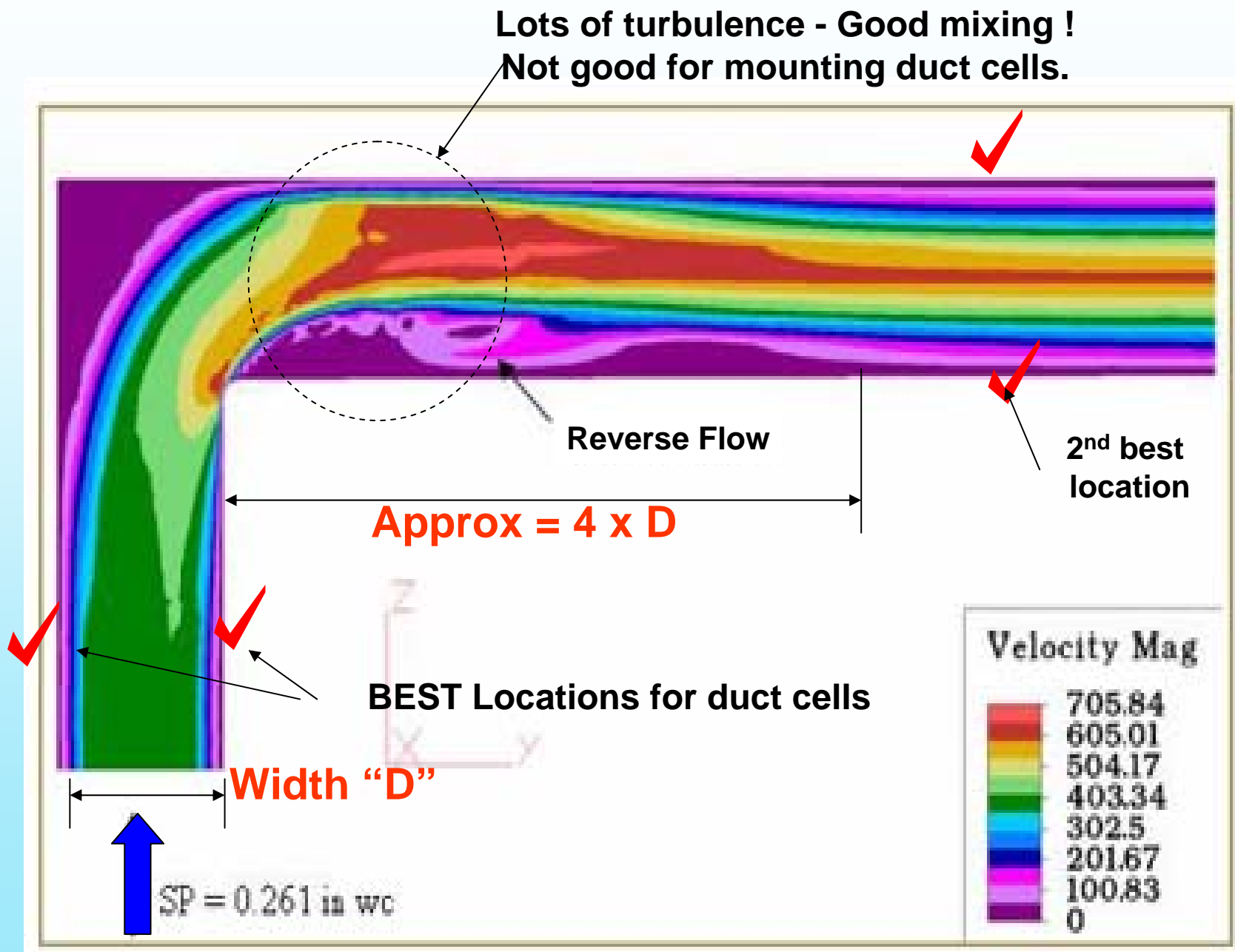


# “Photo” Process



# DUCT CELL LOCATION TIPS

( Computer analysis of air flow turbulence at a “right angle” transition” )

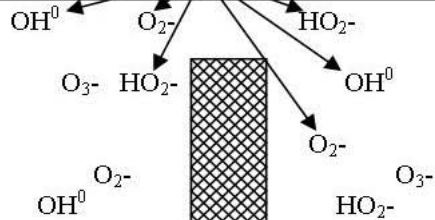


UV Bulb

Mold Spores

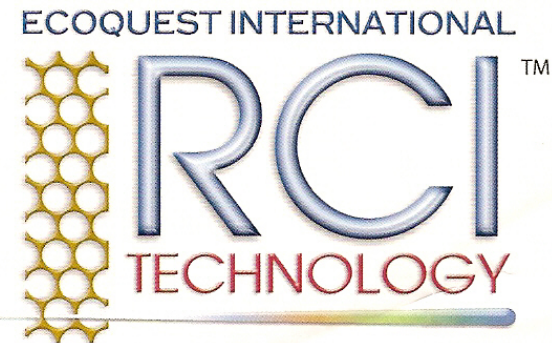
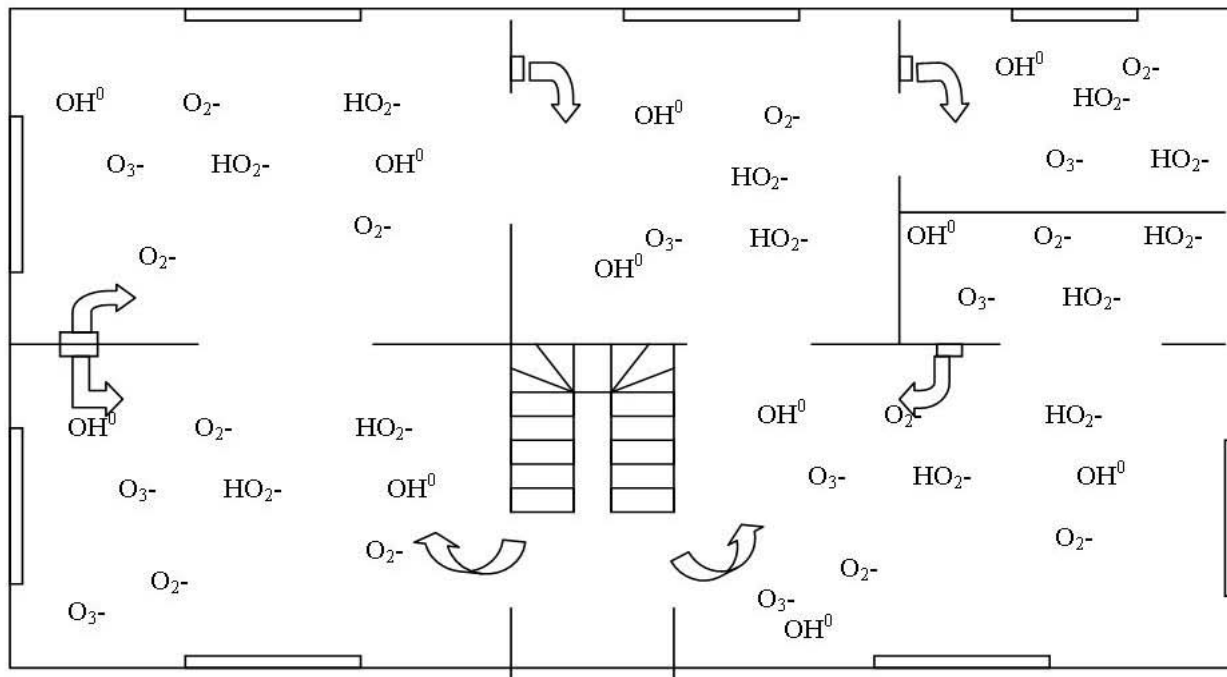
Traveling @ 100 CFM or 1.67 Cubic Feet per Second. Mold must be exposed for 3 seconds within 1 to 3 inches of UV to kill it. At 100 CFM mold is not exposed long enough to kill it

Advanced Oxidation Process (AOP)



The Advanced Oxidation Process creates a "Purifying Plasma" which is distributed through the entire house. AOP Reactants remain effect after leaving the probe as "Purifying Plasma" as shown Below.

DuctwoRx



The Advanced Oxidation Process produced with the Fresh Air and DuctwoRx creates a "Purifying Plasma" that is distributed into the breathing space and attacks the problem at the source. This process is at work continually throughout the entire home as illustrated in the diagram at left.



# ADVANCED OXIDATION TECHNOLOGY

Eliminate odors, Air Borne / Surface Contaminates, VOC's & Controls Particulates

## Fresh Air Machine (no installation)



**HVAC COMPANY**

Service Tech 1

6 Calls / Week  
1 Unit Sold / Week

= **\$204** Additional Profit / Week

Service Tech 2

6 Calls / Week  
1 Unit Sold / Week

= **\$204** Additional Profit / Week

Service Tech 3

6 Calls / Week  
1 Unit Sold / Week

= **\$204** Additional Profit / Week

|                    |                 |
|--------------------|-----------------|
| Fresh Air Machine  | \$749 ea        |
| Service Tech Spiff | \$50 ea         |
| Cost to Dealer     | <u>\$495 ea</u> |
| Profit             | \$204 ea        |

**Total Annual Profit is Approximately \$30,600**

(Based on 3 service techs / one sale per week each.)

# ADVANCED OXIDATION TECHNOLOGY

Eliminate odors, Air Borne & Surface Contaminates, VOC's

## DuctwoRx



**HVAC COMPANY**

Service Tech 1

6 Calls / Week  
1 Unit Sold / Week

= **\$350** Additional Profit / Week

Service Tech 2

6 Calls / Week  
1 Unit Sold / Week

= **\$350** Additional Profit / Week

Service Tech 3

6 Calls / Week  
1 Unit Sold / Week

= **\$350** Additional Profit / Week

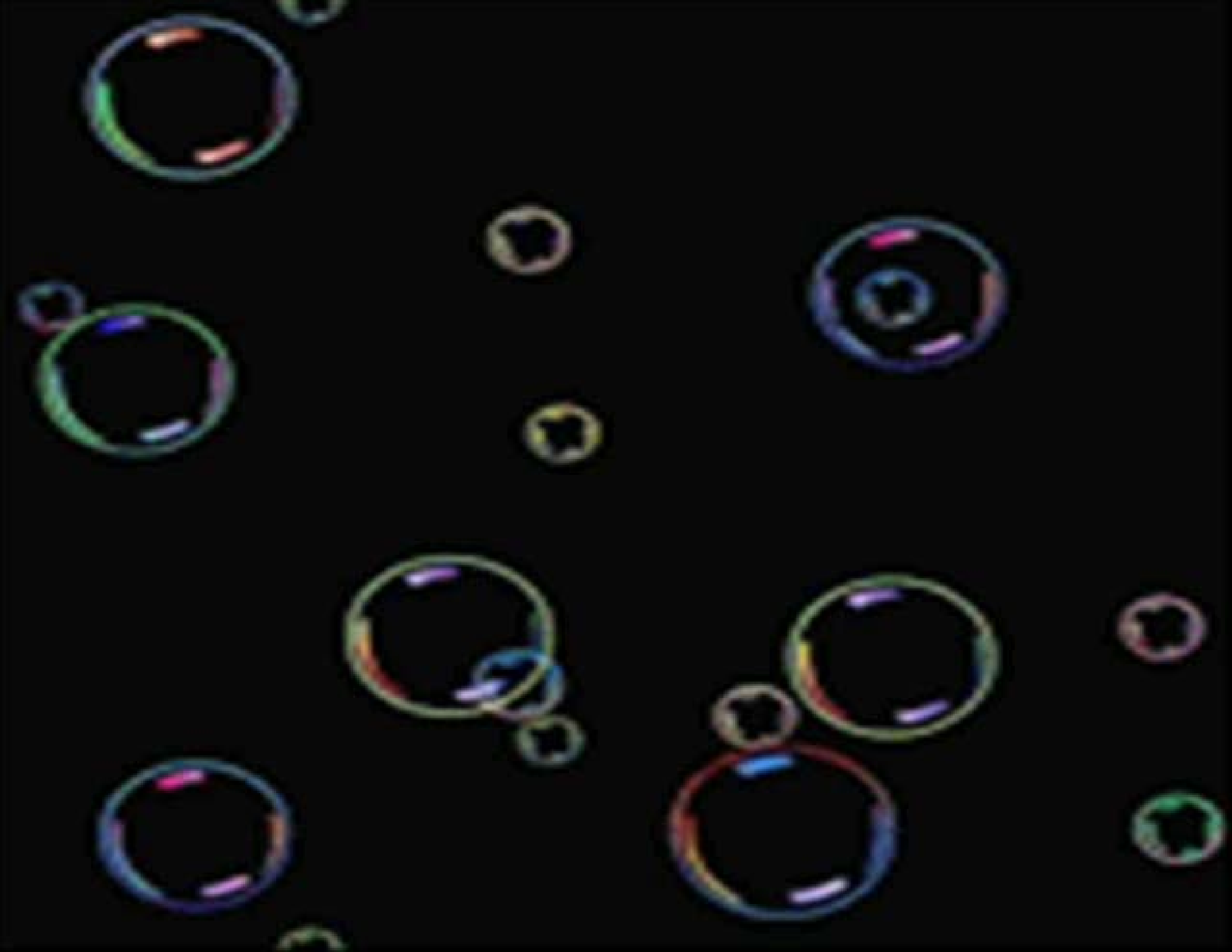
|                    |                 |
|--------------------|-----------------|
| DuctwoRx Installed | \$695 ea        |
| Service Tech Spiff | \$50 ea         |
| Cost to Dealer     | <u>\$295 ea</u> |
| Profit             | \$350 ea        |

**Total Annual Profit is Approximately \$52,500**

(Based on 3 service techs / one sale per week each.)



What if you didn't need:  
**Detergent, Bleach,**  
**Fabric Softener** or **Hot Water**  
To wash your clothes?



# How Does It Work?

## RCI Technology

Using a technology developed by NASA and improved by EcoQuest, the “RCI Cell” produces millions of tiny oxygenated air bubbles that are injected into the water, which clean your clothes without the use of harsh chemicals. LaundryPure also incorporates other processes, including Silver Nano Ions, which provides odor protection for your clothes.

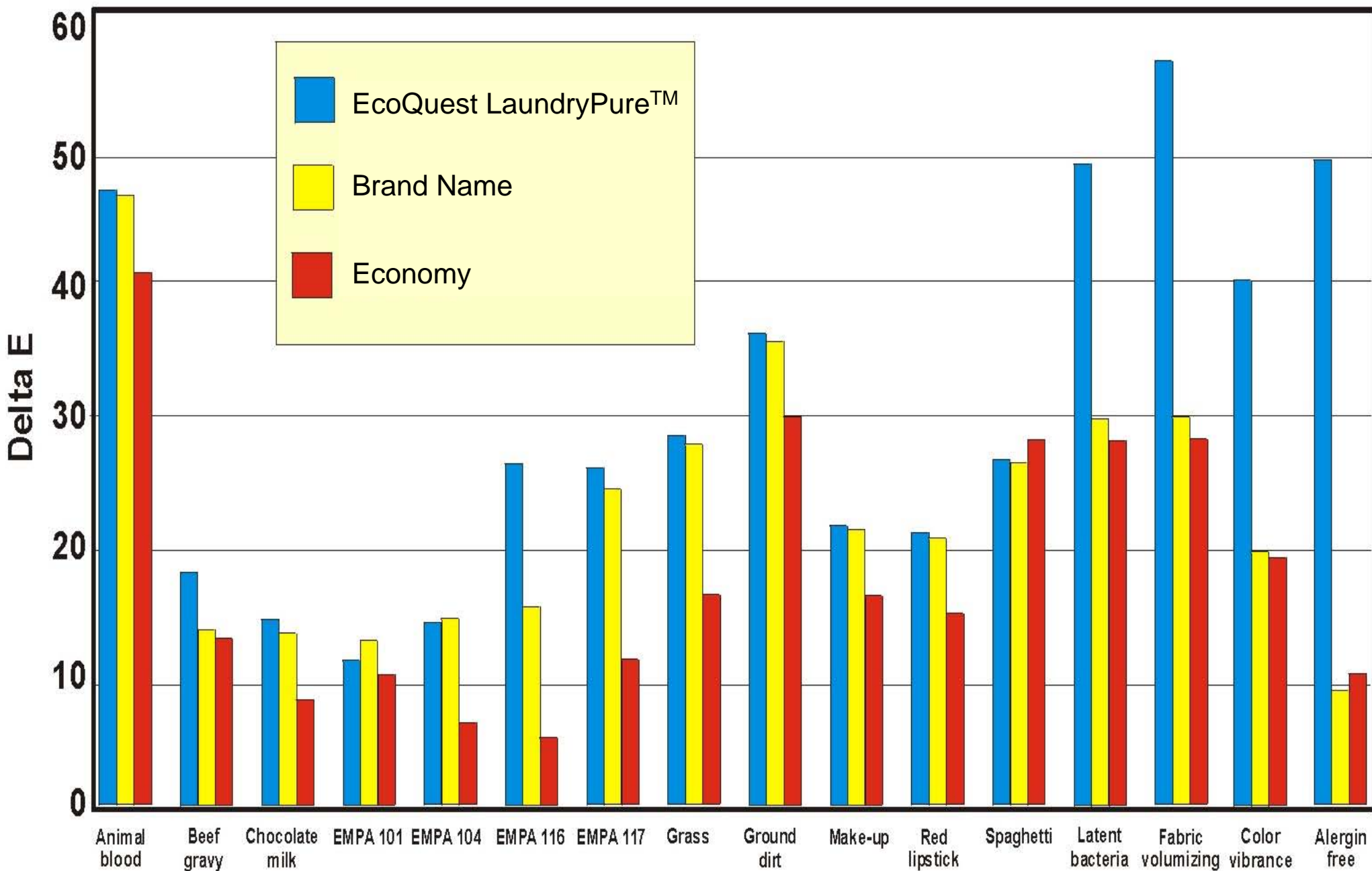
## The **LaundryPure** Experience

- Better for your Clothes...and your skin
  - Money Savings
  - Bacteria Killing
  - Environmentally Friendly
- Makes Doing Laundry **EASIER!**



# Commercial Laundry Test

EcoQuest Laundry Pure vs. Brand Name & Economy detergents



# Benefits

- A product line that provides a total solution for indoor air pollution that a typical HVAC system only minimally addresses.
- The ability to provide customers with state-of-the-art Space Certified Technology used by NASA in the Space Program that is not available from any HVAC manufacturer.
- The potential to increase bottom line profits significantly.
- The opportunity to expand into other products areas easily to provide additional “Healthy Living Technologies” while adding to bottom line profits i.e. LaundryPure™
- Backed by months of testing and published “peer reviewed” studies at major US Universities.
- The satisfaction and confidence knowing you and your company have the best products available from a 20 year old company that began the indoor air purification industry, and is the world leader with its state-of-the-art cutting edge technologies.