

**REJUVINAIR<sup>®</sup> ROOMS**

***Press Release Kit***

**PROJECT: REJUVINAIR® ROOMS**

**FOR RELEASE: Wednesday, May 11, 2005**

**Press Kit Number: 050605 – DC**

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[www.rejuvinairrooms.com](http://www.rejuvinairrooms.com)

**Welcome**

**REJUVINAIR®**

May 11, 2005

Dear Friends,

Thank you for your interest in the **REJUVINAIR® ROOMS** program. Our goal is striving to deliver the cleanest, healthiest and environmentally safe indoor air humanly possible!

Most people don't even realize the filth they are breathing. In May of 2000 the US Environmental Protection Agency (EPA) said ***"Indoor air is one of the greatest health hazards in America today!"*** Health effects from indoor air pollutants may be experienced soon after exposure or, possibly years later. Such effects are similar to those of colds or other viral diseases.

We addressed this issue in 1997 with **REJUVINAIR®** and continue to enhance our services with **REJUVINAIR® ROOMS**. We believe that no detail is too small to be worthy of attention and that no detail affecting our children's health is too small to be properly communicated to those who may not be informed of the possible effects. This is the idea that created **REJUVINAIR® ROOMS**, ***"Clean to the Extreme!"*** It is your right, your family's right and above all, it is your child's right...

***Environmentally safe indoor air should not be an option!***

We will continue to pursue new avenues to improve our services. Communication will sow the seeds to dispel ignorance & myths concerning clean healthy indoor air. For additional information on **REJUVINAIR®** and related services, visit our web site at [www.rejuvinairrooms.com](http://www.rejuvinairrooms.com).

Sincerely,

Richard Namovich  
Founder **REJUVINAIR®** Inc.



## Clean to the Extreme!©

*The Palm Plaza Ocean Front Resort strives to provide their guests the cleanest, healthiest and environmentally safe indoor air humanly possible!*

**Daytona Beach, FL, June 8, 2005** – **REJUVINAIR®**, the world’s indoor air quality (IAQ) leader announces the inaugural launch of its **REJUVINAIR® ROOMS** system at The Palm Plaza. “This is a working testimony, proving it is possible to deliver clean, healthy and environmentally safe indoor air for little or no increase in cost,” said Greg Schulman, Vice President of **REJUVINAIR®**. “*We are clean to the extreme!*”

The **REJUVINAIR® ROOMS** system is an integrated solution, combining hardware, software, service, experience and diligence striving to produce the cleanest, healthiest and environmentally safe indoor air humanly possible for their guests, families and especially their children.

“Most people don’t even realize the filth they are breathing in a motel room,” said Richard Namovich, founder of **REJUVINAIR®**. “We strive to deliver clean, healthy and environmentally safe indoor air, free of harmful cleaning chemicals and ozone.”

**REJUVINAIR®** Inc. became the World’s IAQ leader in 1997, by providing a safe and chemical free solution to clean and sterilize packaged air handling equipment. Today, **REJUVINAIR®** continues to lead the IAQ industry in innovation with its **REJUVINAIR® ROOMS** process.

**REJUVINAIR®** is also spearheading an Environmental Protection Agency (EPA) request for an IAQ education program in elementary schools with it’s subsidiary **ME&U&IAQ©** inc. To receive additional information concerning this important IAQ development pull up [www.meuiaq.com](http://www.meuiaq.com) and meet Ms. Airheart and the kids at Sunnyside School.

“Children are our future, it is our responsibility to promote, demand and strive to provide healthy and environmentally safe indoor air in our children’s schools, where we work, live and play.”



**REJUVINAIR® GOES GREEN**

**REJUVINAIR® Signs Florida Green Lodging Certification Program Partnership Agreement.**

Tallahassee, Florida—April 29, 2005— **REJUVINAIR®** today announced that it has signed a partnership agreement with the Department of Environmental Protection (DEP).

In the agreement **REJUVINAIR®** agrees to use the partnership to promote the Florida Green Lodging Certification program and to assist the lodging industry to reduce its impacts on Florida's fragile environment.

"We will continue to assist and educate those who ask for help," said Richard Namovich, founder / CEO of **REJUVINAIR®**. "The direction we are striving to provide is clean, healthy and environmentally safe indoor air, free of harmful cleaning chemicals and ozone. Partnering with the DEP is another step in the right direction."

To find out more information about this important program. Visit [www.floridagreenlodging.org](http://www.floridagreenlodging.org) or call Karen Moore at the Florida Department of Environmental Protection 850.245.8726.

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"Children are our future, it is our responsibility to promote, demand and strive to provide healthy and environmentally safe indoor air in our children's schools, where we work, live and play."



## ***Clean to the Extreme!©***

The **REJUVINAIR® ROOMS** program was developed over the last eight years to provide the lodging Industry with a marketable amenity that increases guest loyalty and occupancy, lowers operating costs and significantly increases profit dollars.

The **REJUVINAIR® ROOMS** program:

- Install (at no charge) a brand new **REJUVINAIR® PTAC** or **HEAT PUMP** and **HEPA-REJUVINAIR® PURIFIER** in each room constantly filtering, cleansing and conditioning the air.
- **REJUVINAIR® IAQ GUARDIAN ANGEL**: Bi-weekly PTAC, Purifier testing, maintenance and inspection
- **REJUVINAIR® IAQ GUARDIAN ANGEL**: Bi-weekly room inspection
- Deep clean all PTAC units using No Chemicals or Poisons of any kind with Super Heated steam every six months
- Replace all Purifier Charcoal Pre-filters (every two months)
- Replace all Purifier HEPA filters (as needed)

*Striving to provide your property with the cleanest, healthiest and environmentally safe indoor air humanly possible for your guests and staff 365 days a year!*

What you receive from the **REJUVINAIR® ROOMS** program:

- A distinct recognizable competitive advantage
- Utility expenses will decrease and be more predictable
- Property qualifies for EPA Energy Star Program
- No expenses on PTAC repairs, maintenance, chemicals or room deodorizers
- Meets all Federal, State and Local requirements, laws and guidelines concerning Indoor Air Quality (IAQ), Illicit Discharge and Hazardous Waste
- Regulatory Documentation Provided
- Meets the first core requirement (Indoor Air Quality-IAQ) for Florida's **Green Lodging Program**
- Reduce chance of IAQ and chemical litigation
- Decreases employee sickness with increased employee productivity
- Retards growth of mold and mildew in room Extending life of room furnishings Regulatory Documentation
- Reduces Room Refunds
- Enhances Image of property, increasing occupancy, increasing profits
- **REJUVINAIR® ROOMS - Clean to the Extreme!©**

# ***Indoor Air Quality IAQ GUARDIAN ANGEL PROGRAM***

**REJUVINAIR®**

***A program is only as good as the safeguards that are built into it.***

The **REJUVINAIR® IAQ GUARDIAN ANGEL** program is designed and performed to protect everyone's health and investment by delivering what is promised.

*“Striving to deliver the cleanest, healthiest and environmentally safe indoor air humanly possible.”*

## **REJUVINAIR® IAQ GUARDIAN ANGEL Responsibilities:**

- Maintain the integrity of the **REJUVINAIR® ROOMS PROGRAM**
- Check in with management daily
- Front desk promotional materials inspected, cleaned and replaced if necessary
- Every **REJUVINAIR® PTAC** is tested, inspected, documented, wiped clean and filter exchanged bi-weekly
- Every **REJUVINAIR® PURIFIER** is tested, inspected, documented, wiped clean, charcoal pre-filter exchanged bi-monthly and HEPA filter replaced as needed
- **REJUVINAIR® ENERGY MANAGEMENT SYSTEM** tested and documented
- In room promotional materials are inspected and replaced if necessary
- **REJUVINAIR® IAQ GUARDIAN ANGEL** Service performance card punched
- Detailed inspection of room documenting problems (see next page)
- Train all new employees
- Performs continual product knowledge and training updates for employees
- Delivers all operational documentation and checks out with management
- Overnight all information to all corporate entities



# Indoor Air Quality IAQ GUARDIAN ANGEL PROGRAM

**REJUVINAIR®**

## Inspection Checklist

REJUVINAIR ROOMS GUARDIAN ANGEL PROGRAM							Motel/Hotel						
Room #							Date						
101	Mold	Dirty	Paint	Rust	Noisy	Not Wkg	4/21/05	Mold	Dirty	Paint	Rust	Noisy	Not Wkg
<b>Door</b>							Patio Door						
Door Lock							Patio Door Tracks						
Door Key							Patio Door Lock						
Door Handle							Patio Light						
Door Hinges							<b>Kitchen</b>						
Door Threshold							Kitchen Sink						
Room Odors							Kitchen Faucets						
Turn on Lights							Countertop/Caulking						
<b>Bathroom</b>							Exhaust Hood						
Bathroom Door							Hood Light						
Threshold							Hood Filter						
Tile Floor							Range						
Bathroom Ceiling							Range Burners						
Trash Can							Refrigerator						
Exhaust Fan							Refrigerator Door						
Vanity Sink							<b>Furniture</b>						
Sink Caulking							Table						
Sink Faucet							Microwave						
Vanity Mirror							Table Chairs						
Hair Dryer							Lounge Chairs						
Toilet							Dresser						
Flush Toilet							Dresser Drawers						
Tank Top							Dresser Mirror						
Bathtub							Television						
Bathtub Ceiling							Remote Control						
Bathtub Caulking													
Bathtub Faucet							Headboard						
Shower Walls							Night Stand						
Shower Head							Night Std Drawer						
Shower Rod							Telephone Book						
Shower Curtain							Bible						
Towel Racks							Telephone						
<b>Closet</b>							Clock Radio						
Closet Doors							Pictures						
Wall Mirror							Picture Glass						
Hangers							Picture Frames						
Iron							<b>Air Conditioner</b>						
Ironing Board							<b>Hepa-Air Purifier</b>						
Towels							<b>Carpeting</b>						
Blankets							Carpet Mold						
<b>Ceiling</b>							Carpet Dirty						
Ceiling Mold							Carpet Vacuum						
<b>Walls East</b>							Carpet Trim						
Walls Left							Carpet Edges						
Walls Right							Floor Tile						
Wall West							<b>Kitchen Light</b>						
Smoke Detectors							Lamps						
Curtains							Lampshades						

Comments: \_\_\_\_\_



## ***Clean to the Extreme!©***

What does REJUVINAIR® do?

REJUVINAIR® is an air conditioner preventive maintenance service company specializing in steam sanitizing/sterilizing, cleaning, toxic mold removal and specialized maintenance services for the 20 Million Air Conditioners found in nursing homes, hospitals, assisted living facilities, hotels, motels, restaurants, offices, schools and commercial properties.

What makes REJUVINAIR® unique?

REJUVINAIR® is a one of a kind company using **NO Anti-microbials**, **NO Acids**, **NO Chemicals** and **NO Poisons** of any kind providing the end user with the freshest, cleanest, healthiest and environmentally safe indoor air humanly attainable.

How does REJUVINAIR® do it?

***Super Heated 305° Power Packed Steam.***

What else does REJUVINAIR® do?

REJUVINAIR® designs, engineers, and manufactures collateral parts and equipment that improves the performance and efficiency of air conditioners.

REJUVINAIR® improves the quality of life and educates through the **ME&U&IAQ©** fundamentals of indoor air quality elementary education programs.

Benefits of REJUVINAIR® :

- Exceeds all Federal, State and Local Environmental, Hazardous Waste, Illicit Discharge, Fire and Indoor Air Quality (IAQ) Laws, Regulations, Requirements and Guidelines
- Reduces utility costs
- Reduces air conditioner purchases
- Reduces air conditioner repair bills
- Reduces air conditioner sleeve replacement costs
- Removes odors from air conditioners (guaranteed 100%)
- Removes and destroys all bacteria, viruses and fungi



## ***Clean to the Extreme!©***

### Benefits Continued

- Dramatically retards and prevents bacterial, viral and fungal re-growth in air conditioners
- Removes and destroys all mold and mildew in air conditioner
- Dramatically retards and prevents mold and mildew from growing and re-occurring in air conditioners and room
- Dramatically increases efficiency of HEPA Room Air Cleaners
- Extends life of room furnishings, carpeting and wall coverings
- Eliminates room deodorizer costs
- Eliminates harmful chemicals and associated costs.
- Reduces room refunds
- Eliminates risk of chemical use litigation
- Reduces risk of bad indoor air quality litigation
- Reduces risk of injury litigation
- Reduces risk of employee injuries
- Reduces employee sickness
- Increases employee productivity
- Lowers insurance costs
- Enhances the image of the facility
- Provides a distinct and recognizable competitive advantage
- Marketing of Indoor Air Quality increases occupancy
- Dramatic increase in profit dollars
- Dramatic increase in REVPAR



## Clean to the Extreme!©

- March 06, 1997 “An idea is born!” Clean PTAC’s (packaged terminal air conditioners), front covers and filters in motels to eliminate room odors. **305° steam** will be used to sterilize, sanitize and decontaminate the air conditioners. **NO ACIDS, NO CHEMICALS** and **NO POISONS** will be used to protect the public, the air conditioner and the environment.
- March 10, 1997 The name **REJUVINAIR®** is formed from **rejuvenate** and **air** conditioner.
- March 12, 1997 Steam machine is designed, engineered and ordered.
- May 05, 1997 **REJUVINAIR®** becomes a Florida Corporation.
- May 30, 1997 First motel (200 PTACS) is serviced.
- June 1997 **REJUVINAIR®** becomes a **registered trademark**.
- July 1997 **REJUVINAIR® MINIMUM STANDARDS** are established.  
Quality work completed safely by competent people becomes the minimum standard.  
There will be no shortcuts, no quantity minimums and only quality work.
- August 1997 Testing and documentation procedures are added to **MINIMUM STANDARDS**.  
Testing each unit before and after service work, documenting problems and identifying warranty and non-warranty work.
- October 1998 **BRAKkit©** & **BALCON©** repair kits are developed.  
Saving our customer money has always been part of **REJUVINAIR®**. These new kits are designed to make our job easier and also save the customer money. The brackets on some PTACs rust away resulting in many problems and premature failure of the condenser fan motor.
- November 1998 Painting of PTAC is added to **MINIMUM STANDARDS**.  
The PTAC looked clean but did not look perfect. The painted PTAC looks new when reinstalled.
- December 1998 Wrapping of PTAC is added to **MINIMUM STANDARDS**.  
Wrapping keeps the filth hidden and presents a quality work image.
- August 1999 Carrier Corporation offers partnership and **REJUVINAIR®** declines offer.  
First Nursing Home (60 air conditioners) is serviced.  
First **PAC** (Roof Top Packaged Air Conditioner) serviced.  
**FIXAleak** © is developed.  
Kit prevents leaking of water from PTAC unit into room.
- December 1999 **FIXAsleeve®** is invented – **PATENT # US 6,418,621 B1**.  
The **fiberglass** PTAC sleeve is screwed into the studding and then the PTAC is screwed into the sleeve. The sleeve is an integral part of the air handling system. Through the years the sleeve becomes damaged and prevents the PTAC to be fastened to it. It costs about \$350 to replace a PTAC sleeve and takes about 3 days. The **FIXAsleeve®** is installed in less than 3 minutes and costs about \$40.00.
- FIXAgrill®** is invented – **PATENT # US 6,418,621 B1**.  
The housekeeping carts and customers luggage carts create another problem damaging the rear part of the sleeve that sits outside the building. The rear grill falls off and creates other problems including litigation. The rear grill is locked to the sleeve.
- May 2000 **Vent Lock©** is developed.  
On some PTACS the incoming air louvers are movable to adjust airflow and can be adjusted by the guest. These usually break off in a short time.  
Approved Vendor for Marriott # 592631.
- May 2000 **REJUVINAIR®** discovers the root of 95% of all indoor air problems are directly related to the air handling equipment and makes this bold statement:



## **Clean to the Extreme!**©

**It is just common sense. The finest engineered air handling equipment built with the finest materials, if not properly cleaned and maintained will fail to work as designed in six short months. It becomes breeding grounds for toxic mold, mildew, fungi, algae, discontentment, sickness, death, heartaches and lawsuits.**

June 2000

First School (75 air conditioners) is serviced.  
First MOPAC and BARD units are serviced.

**ME&U&IAQ**© Copyrighted.

IAQ educational awareness program is developed for elementary school children grades 1-6.

July 2000

**REJUVINAIR**® is successful in lobbying for AHCA to regulate a scheduled air conditioner maintenance program for all Florida health care facilities.

**REJUVINAIR**® **ZERO RISK GUARANTEE**© is established.

Simply put: "If the client doesn't save the cost of **REJUVINAIR**® Services, client doesn't pay!"

**REJUVINAIR**® **GUARANTEES** Federal/State/Local **COMPLIANCE!**

Simply put:

**REJUVINAIR**® accepts all responsibility and pays all fines

September 2000

**PTAC WARNING LABEL**© is developed and copyrighted.

Warning label informs guest of the dangers of the PTAC unit which will reduce the chances of litigation.

December 2000

**FEDERAL/STATE Documentation Kit**© is developed and copyrighted.

Easy to set up documentation kit to substantiate all work done.

March 2001

**Harborside Healthcare** (14 States) first National Account.

51 properties are serviced throughout the Northeast.

April 2001

**REJUVINAIR**® becomes **first vendor accepted** by the now defunct Options, IAQ Philip Morris Hospitality Program.

May 2001

First Assisted Living Facility (158 units) is serviced.

First HUD Public Housing Property (180 units) is serviced.

January 2002

**REJUVINAIR**® **ROOMS** is developed.

**"A Breath of Fresh Air!"**

Partnership is established with **Hunter Fan** to manufacture **REJUVINAIR**® **PURIFIERS**

First franchised restaurants are serviced.

McDonald's, Arby's, Chili's, Dunkin Donuts,

Steak and Shake and Waffle House.

August 2003

Work begins with Fairfield Inns by Marriott in 9 States.

The Fountains of Boca Ciega Assisted Living 700 Unit property is brought on line to recondition 30 PTACS per month.

March 2004

Florida Department of Environmental Protection's Green Lodging Program requests the help of **REJUVINAIR**® to set the standards for clean air requirement.

April 2004

**REJUVINAIR**® **Energy Management Systems** is formed.

Alliance formed with InnComm to manufacture EMS to **REJUVINAIR**® design specifications.

Since **REJUVINAIR**® is part of Green Lodging **REJUVINAIR**® changes its direction and all crews are pulled off of the road to service Florida specifically Orlando and the hospitality industry and **REJUVINAIR**® **ROOMS**.



## Clean to the Extreme!©

- May 2004 **FIXAsleeve®** is developed to repair rusted **steel** wall sleeves - Patent applied for  
The steel PTAC sleeve is screwed into the studding and then the PTAC is screwed into the sleeve. The sleeve is an integral part of the air handling system. Through the years the sleeve bottom becomes rusted and leaks water into the building and room. It costs about \$350 to replace a steel PTAC sleeve and takes about 3 days. The **FIXAsleeve®** is installed in less than 3 minutes. Cost about \$40.00.
- May 2004 **FIXApan®** is developed to repair PTAC base pan - Patent applied for  
The base pan of the PTAC is one of the first parts to rust through creating leaking problems. **FIXApan®** is installed in about 3 minutes extending the life of the PTAC. Cost is about \$30.00
- June 2004 **REJUVINAIR®** becomes Champion for H2E (Hospitals for a Healthy Environment).  
A champion is a Green Vendor who promotes a healthy environment and green products. **REJUVINAIR®** is the only air conditioner sanitizing and cleaning vendor appointed by H2E.
- July 1, 2004 ASHRAE (67,000 members) appoints Richard Namovich of **REJUVINAIR®** to roster of SPC 180, "Standard Practice for Inspection and Maintenance of HVAC Systems" as a voting member of which only 22 were appointed.  
Scheduled completion for standard is June 24, 2005.
- August 1, 2004 **REJUVINAIR® CORPORATE** announces the formation of a new divisional structured corporation.
- **REJUVINAIR®MARKETING**
  - **REJUVINAIR®SALES**
  - **REJUVINAIR®SERVICES**
  - **REJUVINAIR®ROOMS**
  - **REJUVINAIR®PRODUCTS**
  - **REJUVINAIR®Energy Management Systems**
  - **REJUVINAIR®Education**
  - **REJUVINAIR®Consulting**
  - **REJUVINAIR®Hospitality**
  - **REJUVINAIR®Health**
  - **REJUVINAIR®Food**
  - **REJUVINAIR®Commercial**
  - **REJUVINAIR®Government**
- November 1, 2004 **FIXAsleeve®** passes field test and survives four hurricanes. Not one fiberglass PTAC sleeve is damaged.  
**REJUVINAIR®** announces the introduction of **HURRICANE PTAC LOCK®** to the insurance industry with the hopes that this lock becomes required in all coastal PTAC installations.
- November 7, 2004 **REJUVINAIR® CORPORATE** announces the formation of a new division.
- **REJUVINAIR®PTAC LEASING**
- January 27, 2005 **REJUVINAIR® CORPORATE** announces the name change of **REJUVINAIR®PTAC LEASING** to **REJUVINAIR®PTAC RENTALS**
- January 28, 2005 ASHRAE and ACCA (Air Conditioning Contractors of America) join to write standard for the inspection and maintenance of HVAC systems. This standard SPC 180 when



## ***Clean to the Extreme!©***

- February 4,5 2005 completed 6-24-05 will be submitted to ANSI (American National Standards Institute) and then will become an ANSI Standard sometime in the first quarter of 2006.  
"End of the Beginning" – Orlando, Florida  
ASHRAE Conference Declares **ME&U&IAQ©** a hit!  
Elena V. Perry – Thornton M.D. embraces **ME&U&IAQ©**
- February 14, 2005 **ME&U&IAQ©** spins off into its own corporation.
- February 22, 2005 **REJUVINAIR®** announces the first **REJUVINAIR®ROOMS** property is Palm Plaza/Beachside and will go on line June 1, 2005. Patent procurement will begin July 10, 2005 for the **REJUVINAIR® PROCESS**.
- March 18, 2005 GFI Safety Shield is invented.
- May 2, 2005 The motto "**Clean to the Extreme!**" is copyrighted by **REJUVINAIR®**

## **QUALITY**

Quality is the glue that holds **REJUVINAIR®** together!  
It applies to not only what we do, but also what each one of us does everyday.  
Everything we do has our signature on it. Be proud of it!  
Anything worth doing is worth doing right the first time!!

## **LOYALTY**

Everyone at **REJUVINAIR®** has a duty to give undivided loyalty to his/her personal family first! We must avoid any situation that might interfere with our exercise of independent judgment!  
We must act only in the best interests of our personal and our **REJUVINAIR®** family and avoid any perception to the contrary.  
**REJUVINAIR'S** interest can never be served by seeking seemingly quick profits or temporary advantages if it means compromising our principles.

## **VALUE**

**REJUVINAIR®** strives to provide ongoing value to everyone!  
Good quality service, at a fair price,  
which is superior to that offered by anyone else!

## **RESPECT**

Everyone with **REJUVINAIR®** has an obligation to treat all people, whether inside or outside **REJUVINAIR®** with the highest respect.  
In return, we will be treated in the same manner.

## **INTEGRITY**

Everyone with **REJUVINAIR®** has the responsibility to adhere to these basic commitments in all of their daily activities on behalf of themselves, their family, and **REJUVINAIR®**

May of 2000 the US Environmental Protection Agency (EPA) said:

“Indoor Air is the  
**GREATEST**  
**HEALTH HAZARD**

America faces today!”

Bio-burdened and neglected air handling equipment fuels  
the poisonous indoor air  
killing over 300,000 people a year.

July of 2004 Report from Global Information, Inc

“Fastest growth will be for environmental services that  
include mold remediation and asbestos abatement.”

US Indoor Air Quality Trends  
[www.the-fosshop.com/study/bc21284\\_indoor\\_air\\_quality.html](http://www.the-fosshop.com/study/bc21284_indoor_air_quality.html)

“Unlike asbestos – toxic mold grows back.”

Chart Services - Manteca

The Indoor Air Quality (IAQ) phenomenon is here  
now.

US Indoor Air Quality Trends

## ***This Hotel Stinks!***

B. CHECKET-HANKS

07/23/2001

Air Conditioning, Heating & Refrigeration News-12

*Hospitality Industry's Problem Provides Contractors With Opportunities.*

CINCINNATI, OH -- How many times have you stepped into your hotel room for the first time, only to be greeted by a stuffy, musty, or downright unpleasant odor? Have you switched rooms because of it? Would you go back to that hotel?

According to an ASHRAE Summer Meeting forum on **indoor air quality (IAQ)**, titled "This Hotel Stinks," there is a perception that **hotels lose revenue** when people refuse to stay in their rooms. At issue were how much revenue hotels lose and whether it's enough to prompt their owners to start paying more attention to HVAC system design and maintenance.

Odors come from smoking, food preparation, water leaks, inadequate cleaning, and HVAC systems. HVAC also plays a major role in distributing the other odors. So, is the problem with design inadequacy, operational failure, or maintenance lapse?

How about all of the above.

## SYSTEM INTERPLAY

One forum participant, who works with a system manufacturer that deals with the hospitality industry, questioned whether there is inadequate design guidance, especially regarding pressure airflow management.

(Note: To promote a free exchange of ideas, ASHRAE forum attendees are not identified by name.)

An engineer commented that hotels often to reduce the amount of outside air brought in to lower their operational costs; they are not using the systems as designed.

Another engineer pointed out that most hotels have ptac's in each room. These units, he observed, tend to be oversized so that they hit their design temperature very quickly but they don't provide adequate dehumidification. "Sizing is a major contributor" to **IAQ** problems, he said.

A filter manufacturer pointed out **that customers wouldn't sleep in a room where they don't change the sheets; why isn't similar care provided for air-handling and filtration systems? "They need to maintain Systems much more vigorously,"** he said.

Instructions for maintenance people is within the scope of ASHRAE, added another attendee. However, "When we get down to requiring and enforcing maintenance, that's a BOMA [Building Owners and Managers Association International function]." **What needs to be established by some regulating body is the frequency with which hotel HVAC maintenance is performed.**

An attendee from an industry related to hospitality suggested that ASHRAE provide a home for hotel HVAC maintenance information. He added that the society should propose a tiered system of minimum maintenance levels and higher levels for hotels that want to raise the bar of **IAQ** for their guests.

Then there are problems with public spaces: meeting rooms, such as those in which ASHRAE forums are held. Temperature becomes an issue, pointed out a consulting engineer. “In meeting rooms, you never know whether or not to bring a sweater.”

Another pointed out that pressure relationships and airflow distribution come into play in the public spaces. “Not all problems are solvable with mechanical ventilation, but many are,” he said.

A manufacturer’s rep reminded the forum that unit accessibility and placement affect how often they are maintained. Too often, systems are jammed into virtually inaccessible locations in order to maximize rentable square footage.

Another attendee questioned why ptac’s are installed so frequently. This is mainly based on their lower installed cost and industry acceptance, it was pointed out. When one engineer proposed something more elaborate, the owner replied, “Nah, this works.”

However, without proper maintenance, they also become a source of humidity, mold growth, and odor problems. In such cases, it would be helpful to have information to present to the owner about the risks of inadequate maintenance and guidelines for proper maintenance. “He probably won’t take them,” said a consulting engineer, “but at least when things go wrong, you can say, ‘What did you expect?’”

Another forum attendee proposed that some enterprising maintenance contractors put together a package for ptac maintenance that includes pulling old systems from their locations, putting in newer or freshly maintained units, and taking the old systems back for routine maintenance. Ptac’s could be cycled and maintained regularly, and steady, profitable work would be created for the maintenance firm.

A consulting engineer observed that unfortunately, “Owners have a use-it-and-dump-it attitude regarding their buildings.” When the building that once was a Hyatt ages, it is remodeled and sold to Holiday Inn, eventually becoming a Motel 6.

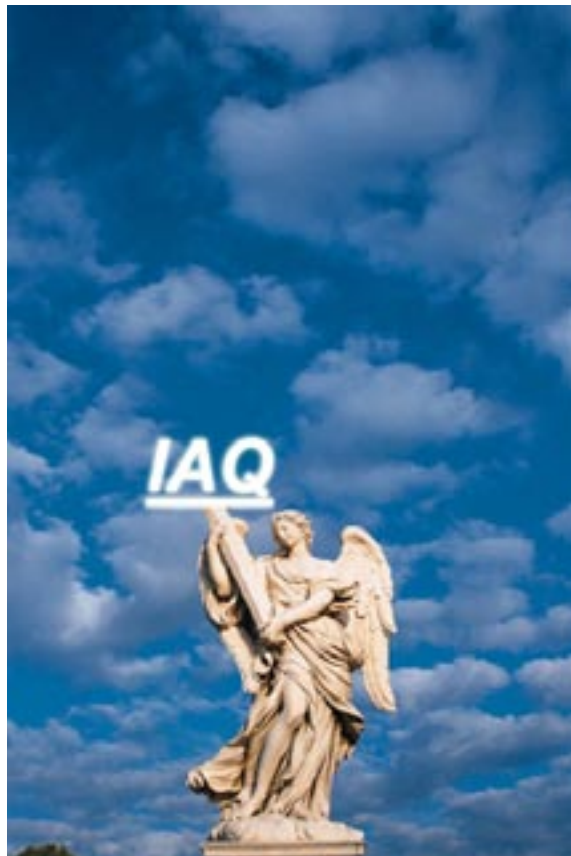
**“You can have the best-designed, best-installed system in the world, but without maintenance, it’s going to develop IAQ problems,”** pointed out another engineer.

## MARKET FORCES

There was one study performed by a ptac manufacturer and hotel chain, which resulted in a modified ptac unit that could bring in sufficient outside air, with high enough horsepower to provide adequate filtration. However, the hotel chain declined to install the units because there were not enough complaints to justify the change. In short, “We don’t know the costs to hotels of odor and **IAQ** problems. If there isn’t enough of a market force, change won’t happen.”

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**REJUVINAIR® IAQ GUARDIAN ANGEL PROGRAM**  
*A program is only as good as the safeguards that are built into it.*





## IMPORTANT INFORMATION

### regarding Florida's Lodging Laws



**ATTENTION: Consumers and Lodging Licensees**

Number: 2002-04 Date: 2002 October 05

**SUBJECT: Mold Infestations and Information**

Complaints regarding mold are probably the fastest growing category of grievance coming into the division. Additionally, the media is increasing the public's awareness of this problem leading to more complaints.

The division's statutory authority is limited to assuring that facilities are, according to Chapter 509.221(3), Florida Statutes, "...properly lighted, heated, cooled, and ventilated and shall be operated with strict regard to the health, comfort, and safety of the guests." Chapter 509.221(4) continues, "Each bedroom in a public lodging establishment shall have an opening to the outside of the building, air shafts, or courts sufficient to provide adequate ventilation. Where ventilation is provided mechanically, the system shall be capable of providing at least two air changers per hour in all areas served. Where windows provide ventilation, each room shall have at least one window opening directly to the outside."

Additionally, Florida Administrative Code Rule 61C-1.004(6), states, "All building structural components, attachments and fixtures shall be kept in good repair, clean and free of obstructions."

An acceptable way to deal with mold is to reduce the moisture problems and reduce moisture in the air. Prevent condensation, repair leaks, increase ventilation (if outdoor air is cold and dry), or dehumidify (if outdoor is warm and humid).

Keep heating, ventilation, and air conditioning (HVAC) drip pans clean, flowing properly, and unobstructed.

Vent moisture-generating appliances, such as dryers, to the outside where possible.

Maintain low indoor humidity, below 60% relative humidity (RH), ideally 30-50%, if possible.

Perform regular building/HVAC inspections and maintenance as scheduled.

Clean and dry wet or damp spots immediately. Fix source(s) of moisture problems as soon as possible.

If you suspect you have a mold infestation consult a professional immediately. Serious financial and legal consequences may result from not properly addressing known problems.

A few resources you may wish to explore include the following:

American Conference of Governmental Industrial Hygienists - [www.acgih.org](http://www.acgih.org)  
 Bioaerosols: Assessment and Control, 1999 Edited by Janet Macher <http://www.acgih.org/store/ProductDetail.cfm?id=349>

American Industrial Hygiene Association (AIHA) ([www.aiha.org](http://www.aiha.org))  
 Mold Introduction <http://www.aiha.org/governmentaffairs-pr/html/mold-intro.htm>  
 The Facts About Mold: For Everyone <http://www.aiha.org/governmentaffairs-pr/html/mold-consumer.htm>  
 The Facts About Mold: For the Professional <http://www.aiha.org/governmentaffairs-pr/html/mold-professional.htm>  
 The Facts About Mold: A Glossary <http://www.aiha.org/governmentaffairs-pr/html/mold-glossary.htm>  
 Report of Microbial Growth Taskforce, 2001 <http://www.aiha.org/Committees/documents/webmicrobial.pdf>

Building Science Corporation ([www.buildingscience.com](http://www.buildingscience.com))  
 What You Need to Know About Mold [http://www.buildingscience.com/resources/mold/mold\\_need\\_to\\_know.pdf](http://www.buildingscience.com/resources/mold/mold_need_to_know.pdf)  
 Mold: Causes, Health Effects and Cleanup [http://www.buildingscience.com/resources/mold/mold\\_causes.pdf](http://www.buildingscience.com/resources/mold/mold_causes.pdf)  
 Mold Testing [http://www.buildingscience.com/resources/mold/mold\\_testing.pdf](http://www.buildingscience.com/resources/mold/mold_testing.pdf)

National Apartment Association <http://www.naahq.org/Government/usatodaymoldmemo.aspx> or <http://www.naahq.org/Education/moldflyer.pdf>

National Center for Environmental Health (NCEH) ([www.cdc.gov](http://www.cdc.gov))  
 Molds in the Environment <http://www.cdc.gov/nceh/airpollution/mold/moldfacts.htm>  
 Questions and Answers on Stachybotrys chartarum and Other Molds <http://www.cdc.gov/nceh/airpollution/mold/stachy.htm>  
 State of the Science on Molds and Human Health <http://www.cdc.gov/nceh/airpollution/images/moldsci.pdf>

U.S. Army Center for Health Promotion and Preventive Medicine Mold Resources <http://chppm-www.apgea.army.mil/mold/>

U.S. Department of Health and Human Services (DHHS) Centers for Disease Control and Prevention (CDC) ([www.cdc.gov](http://www.cdc.gov))

U.S. Environmental Protection Agency (EPA) ([www.epa.gov/iaq](http://www.epa.gov/iaq))  
 Mold Resources <http://www.epa.gov/iaq/molds/moldresources.html>  
 Mold Remediation in Schools and Commercial Buildings [http://www.epa.gov/iaq/molds/mold\\_remediation.html](http://www.epa.gov/iaq/molds/mold_remediation.html)

**FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**

Jeb Bush, *Governor*

**Division of Hotels and Restaurants**

Kim Binkley-Seyer, *Secretary*

## Mold Checks In

*Long considered a nuisance, mold is surfacing as a serious and costly menace to the lodging industry*

March 1, 2003  
Grace Wagner, Senior Editor  
Lodging Hospitality

The topic of mold and the hazards it poses to a hotel, its employees and guests is nothing new. Moisture penetration has long been a problem for hotels and other commercial buildings. Last summer, however, mold made headlines around the world when the Hilton Hawaiian Village came down with a multimillion-dollar case of the stuff. The hotel's brand new luxury tower, Kalia, was so full of mold, in fact, that Hilton closed down most of the wing in July and has yet to reopen its 453 guest-rooms. While original damage estimates fell somewhere in the \$10-million range, Hilton recently acknowledged the final remediation figure will exceed \$50 million, or more than half the cost of the Kalia tower's original construction.

While Hilton sifts through the rubble and attempts to determine liability for the bank-breaking Kalia fiasco, hotel operators around the world are voicing concern and wondering where to start in determining whether mold is lurking in their own properties.

"Mold is everywhere, but that's hard to explain to a panicked public," says indoor air quality expert George Benda, head of the Chicago-based Chelsea Group. While hotels located in humid climates have more reason for concern, the potential for mold growth exists in any geographic location, he says: "No matter where you are, once you bring in the various types of mechanical cooling used in today's large commercial buildings, you can create the right environment for mold to grow."

Over the last six months, Benda has worked with many hotel operators on the Hawaiian Islands, where "everyone is scrambling to test their air and prove that they are mold-free," he says. While he can understand the concern, Benda stresses that the diagnosis and remediation of mold require calm and careful handling, both from a health safety and from a liability perspective. The steps a hotel takes to determine if mold is a problem and what it does with the resulting information are where the expertise of a consultant proves invaluable. Prevention is also key, Benda says: ***"Knowing the facts about mold, how to prevent conditions that can lead to mold growth, and effectively managing the risk can help calm the fear, enhance the quality of a property and protect owners, managers, designers and builders from liability."***

Benda explains there are three basic ways that mold can grow into a big problem for a hotel. The first is in the building's original design concept, where errors lead to the creation of condensation planes in the walls. "There is no operational procedure that can prevent the growth of mold in this case," he says. The second scenario occurs when a new or existing hotel purchases ff&e that harbors mold, in which case, he says, ***"they're actually installing the mold. It can be any material—a rug, a packaged terminal air conditioner (PTAC)."*** The third and most common

**way for mold to flourish is when a hotel ignores such operational problems as a leaky roof or poorly installed PTAC drainage.** “The rug gets wet, there’s pressure to rent the room, it stays damp for 48 hours, and you’ve got a problem,” Benda says.

In new construction, Benda stresses the importance of design innovation, excellence and follow-through. “The entire design team has to be aware of the potential for mold in what they’re creating,” he says. “So often, architects and builders aren’t even aware of how the building is performing once they’re done with it. They’ve moved on to the next project, and they’re doing it the same way they did the last one.”

For an existing property operator, Benda recommends the following plan of action: Begin with an assessment. “Don’t do a mold sampling test yourself and don’t call your original engineering firm. Hire a Certified Indoor Air Quality Professional (CIAQP) or a Certified Indoor Environmentalist (CIE) to do the assessment,” he suggests. Once the assessment is completed, act quickly if contamination is found. “Consult a lawyer before you start documenting anything,” he says. “There are culpability and discovery issues that come into play here which are best handled by an experienced attorney.”

**Most importantly, he cautions hoteliers faced with mold not to bury their heads in the sand. “If mold can grow in 48 hours, think of the damage it can do over 11 months,” he says.**

by Grace Wagner [editor@lhonline.com](mailto:editor@lhonline.com)

## ***Employers Face Mold Problems***

by Stephanie Armour, USA TODAY

After moving into a new office building in New Orleans, Sherry Watters and her co-workers began complaining of odd ailments. Rashes. Runny noses. Breathing problems so severe that some employees carted oxygen to meetings.

Watters never thought leaking water from roofs, pipes and other sources was to blame for her headaches and the other complaints.

But now the lawyer at the Louisiana Department of Social Services is convinced that water damage caused a toxic mold infestation that sickened hundreds of staffers.

“We could see the mold, the big black spots on the ceiling,” says Watters, 45, who was relocated this year along with other employees from the Plaza Tower office building.

“It was in the vents, the air ducts. We just wanted a safe and healthy work environment. It was scary.”

Already a costly hazard for homeowners, mold is fast becoming a pressing legal and health problem for employers as well. (Related item: Chat with author Jeffrey May)

Mold has shuttered public school buildings and hospital wings, prompted employers to scramble for alternative work sites, and left contractors paying multimillion-dollar jury awards.

**Employees are filing lawsuits about health problems they say were caused by mold. They're refusing to work in buildings they suspect are infested.**

**And in some cases, companies are spending millions of dollars on environmental tests, new office buildings and remediation efforts after workers complain.**

In New Orleans, a class-action lawsuit against the Plaza Tower owner and the state is pending; employees say the owner was aware of the mold problem but covered it up. B.G. Real Estate, which manages the property, referred inquiries to a lawyer who did not return calls seeking comment.

Thousands of lawsuits have been filed in the past decade, and many of the largest settlements and jury awards involve commercial buildings.

**No employer is immune: In July, Hilton Hotels closed part of a facility in Hawaii after mold was found by a cleaning attendant. Guests were relocated, and a search is now on for the cause of the moisture.**

It's an increasingly familiar story. Other organizations, such as medical centers, elementary schools, hotels, day care centers, publishers and government agencies have grappled with mold problems in the past few years.

Employees say they've experienced memory problems, bloody urine, rashes, suppressed immunity, canker sores, spontaneous nose bleeds and respiratory ailments so severe that they've led to hospitalizations.

But skeptics say concerns about mold are mostly hype and pseudo-science.

"There's a lot of hysteria that comes from the media, and that prompts people to be afraid," says Patrick Perrone, a lawyer in Newark, N.J., at McCarter & English, who represents property owners in mold claims.

"There's a lot of overreaction and overkill. This is a litigation trend. Attorneys have realized they can bring a case and make money."

But the concern is taking a toll on employers, commercial contractors and managers of office buildings.

## ***The impact:***

Relocations. Employers have been forced to seal offices or relocate hundreds of workers because of mold.

The Martin County Courthouse in Stuart, Fla., was closed in 1995 and completely gutted after toxic mold was discovered. Because of fears of contamination, even paperwork had to be left behind - copied later by cleanup crews in airtight clothes resembling moon suits.

That's hardly unusual. In several cases, employees have been banned from bringing their belongings with them to a new work site unless they decontaminate the papers themselves.

The county later sued the construction manager and won a \$14 million jury award to cover cleanup and other costs.

First-of-a-kind government regulation. In a step that is garnering attention across the USA, California lawmakers in 2001 passed legislation that calls for a study by the California Department of Health Services that could ultimately lead to the first indoor air quality standards for mold spores.

**In addition, the state's Occupational Safety and Health Standards Board has just adopted a new regulation requiring the conditions that cause mold, such as uncontrolled intrusion or accumulation of water, to be corrected as a basic measure of sanitation.**

Litigation. About 9,000 lawsuits involving toxic mold have been filed in the USA and Canada in the last 10 years, according to National Underwriter Property & Casualty - Risk & Benefits Management. Personal injury claims are being filed against building owners and property managers; the rise in class-action cases represents an additional financial threat to employers.

Some workers also are bringing lawsuits about the way employers handle mold-related health concerns. They're asserting that health reactions to mold are covered under the federal Americans with Disabilities Act. More are asking employers for accommodations such as new offices, air-quality testing and duct cleaning.

An HIV-positive employee at Newport News Shipbuilding & Drydock in Virginia complained about his allergy to mold, and the Equal Employment Opportunity Commission (EEOC) filed a lawsuit in 1996, saying the company failed to make reasonable accommodations for the employee, but the case was dismissed.

“It can be covered in some cases,” says Chris Kuczynski, a lawyer at the EEOC in Washington. “Some people believe these are psychological, not physical, but psychological issues also are covered. It’s an area that people are saying we will hear more about.”

Mold cases can be costly, even when lawsuits aren’t filed. After some buildings at Nicholls State University in Thibodaux, La., were saturated with floodwater, maintenance crews carried out cleanup and repair. Returning six weeks later, biological sciences professor John Green walked into the hall in the building where he teaches and knew something was amiss.

“Excuse the expression, but I damned near died,” he says.

Green says he could smell the musty odor of mold, which caused him to leave at the end of the day with headaches and a raspy voice. Within three days, he says he could barely speak. Colleagues complained, and some students wouldn’t go to class.

The university wound up spending \$130,000 to clean the roughly 67,000-square-foot building in 2001. Workers in airtight suits worked the weekend as offices remained closed or sealed in plastic.

“We’d read horror stories (about mold) and didn’t want to be part of that,” spokesman Michael Delaune says. “It cost us a lot of money to address it head-on, but we had no choice.”

But in an example of just how litigious mold issues have become, Green was startled to receive calls from out-of-state lawyers eager to take a case - even though he had no plans to sue.

Lawsuits can come with staggering price tags. After Santa Clara County temporarily closed its courthouse in San Martin, Calif., because of mold, they sued the general contractor, architect and others for alleged building deficiencies. The case was settled last year for \$12 million.

Spokesmen for the general contractor and architectural firm both said representatives who could comment on the case were not available.

To keep business running, the county had to move employees to makeshift offices - purchasing trailers, running cable for computers, setting up plumbing, lighting and security.

“It’s like building a mini city,” says Robert McGregor, a San Diego lawyer who represented the county in the case. “I’ve collected maybe \$40 (million) or \$50 million for various types of building managers. These aren’t condos or homes. These are commercial buildings.”

To skeptics, such cases are an example of how mold is turning into a runaway litigation train. Lawyers stand to make such a killing, they say, that cases are being brought even though the science behind toxic molds’ health effects still isn’t proven.

But plaintiff lawyers maintain that too many employers and building managers aren't taking workers' health concerns seriously enough.

"The average owner of a building, rather than trying to do what's right, tries to cover it up," says Madro Bandaries, a lawyer at Gretna, La.-based Amato & Creely, which is handling several cases involving mold in the workplace. "The buildings become petri dishes for mold. This is an issue employers are going to have to deal with."

While some ignore complaints, employers are taking a variety of approaches when coping with mold. Some are taking epidemiological surveys of the building where they question workers about their health complaints and compare it with the results of surveys done in control buildings where no mold has been found.

Employers and office building owners also are bringing in doctors and industrial hygienists to talk to workers about what's being done.

But more are abandoning buildings altogether, moving employees to trailers and makeshift locations. Millions of dollars are spent on securing new space and decontaminating office equipment - money employers must then try to recover by suing the building contractor, owner, managers or designer.

In some states, workers have no recourse other than filing workers' compensation cases.

"The biggest cases involve commercial buildings. It's the ultimate nightmare for employers," says Alexander Robertson, a Woodland Hills, Calif., lawyer at Robertson Vick & Capella, who took his first mold case in 1995. He now has 1,000 lawsuits pending.

**"One bad case could put them out of business."**

It's a risk Kathy Masera understands. The publisher of California Job Journal, an employment newspaper based in Sacramento that serves Northern California, leased space in a building that was contaminated with mold from a broken pipe, according to a lawsuit and an article in the Occupational Safety and Health Administration's Occupational Safety & Health magazine.

The mold colonization was so rampant that Masera says some workers developed spontaneous nosebleeds; Masera says she wound up in the hospital with respiratory infections. Even the office plants, she says, withered and yellowed.

The publisher was forced to relocate in two days, and decontamination workers in airtight suits scoured belongings - down to the paper clips. According to the lawsuit and article, almost everything had to be left behind, including office chairs and phone books.

All her 30 employees had to dry clean their clothes before stepping into the new office, in case mold spores were lurking in blazers and slacks.

She filed a lawsuit against the building's property manager, Pacific Gulf Properties of Newport Beach, Calif., and the case was settled this year.

The company did not return calls seeking comment.

"It cost us a fortune, and it was heart-wrenching to see people you care about who are so sick you have to send them home," Masera says.

"I was frightened to death. And you can't recover lost productivity. You can't recover that cost."

## ***Mold Lawsuits Fueling Business***

by Jason Felch Bee and Debbie Noda - Staff Writers, The Sacramento Bee

MANTECA -- Mary Finn is your typical busy doctor, except her patients have doors, windows and ventilation shafts instead of mouths, ears and lungs.

Finn, the 48-year-old owner of Chart Services, probes deep into walls with moisture meters, sucks air across petri dishes, and uses laser particle counters to measure airborne pollution.

While testing indoor air quality of commercial and residential buildings across the state, Finn is looking for those oddly named fungi that make buildings, and sometimes the people in them, sick: cladosporium, aspergillus, and the dreaded stachybotrys, the bad boy of the “toxic molds.”

“Mold and moisture is the biggest issue in residential housing,” said Finn, who opened Chart Services last year after 19 years of consulting in Iowa. “Moisture is the biggest factor in the life expectancy of a house.”

Chart Services is part of a growing number of businesses benefiting from the controversial explosion in toxic mold lawsuits across the country. Up from a handful of cases in the mid-1990s, there are now an estimated 10,000 lawsuits in the United States, with a majority of them in California, lawyers say.

“The rate of filings is increasing exponentially,” said Frank Perrott, an attorney with Downey, Brand, Seymour, and Rohwer in Sacramento. Perrott, who has been handling construction defect lawsuits for nine years, says almost every lawsuit has a mold complaint attached.

Media attention and high-profile lawsuits by celebrities like Erin Brockovich and Ed McMahon helped fuel the rise. Despite some fuzzy science on the dangers of mold and the difficulties in determining legal responsibility in court, many have found it a lucrative complaint.

“Mold is Gold” seminars are mushrooming.

The buzz has made consultants like Chart Services a hot commodity.

“In the field of mold we’re facing tremendous problems: misinformation, public fright, greed and avarice,” said Dale Thayer, a Modesto attorney who has worked on mold cases. “Mary brings a balance to this with her tremendous credentials.”

Finn, who has degrees in microbiology and industrial hygiene, says mold is the new growth industry. Developers want to limit liability, and law firms like Perrott’s and Thayer’s hope to use experts like Finn as witnesses in mold-related lawsuits.

Finn relocated to the valley two years ago to take advantage of the booming “mold market,” fueled locally by rapid new housing development. She still owns her consulting company in Iowa.

Contrary to what many think, new homes are particularly susceptible to mold, Finn said. Modern construction techniques make them airtight, which is energy-efficient. But when things get wet, they don’t dry out.

Chart launched in February 2001, and its annual revenue is already approaching \$1 million. Finn expects to increase her staff of technicians and support people from five to 25 by next year, and is projecting \$3 million in revenues by that time.

The news may be more grim for many of Finn's clients, who include JKB Homes, McCroy Wilbur Communities and the Builder's Industry Association of Central California.

According to Perrott, mold lawsuits could be "financially catastrophic" for builders and developers if insurance companies exclude coverage for mold-related claims, as some are doing.

Others argue mold is a fad and draw parallels to the rise in asbestos lawsuits that spiked in the 1980s and declined as buildings were cleaned up. But the mold issue is unlikely to go away.

"Unlike asbestos," said Finn, "mold grows back."

## What Exactly Is Ozone?

A molecule composed of three atoms of “oxygen”. Two atoms of oxygen form the basic molecule, which is the oxygen we breathe; the third one can detach and join with other substances...some safe...some toxic

## Can Ozone Be Harmful?

Ozone reacts with some common substances and produces water vapor.

Ozone reacts with some chemicals such as formaldehyde and forms an acid.

## What Can Produce Ozone?

- Ultraviolet light can produce ozone
- Produced by copy machines & laser printers
- Produced by electronic air cleaners
- Produced by negative-ion generators
- Produced by dedicated ozone generators

## What Are Potential Risks?

- Decrease in lung capacity
- Aggravation of asthma
- Throat irritation
- Chest pain and shortness of breath
- Inflammation of lung tissue
- Destruction of olfactory senses
- Higher susceptibility to respiratory infection

## Most Serious Documented Problem

In a study done by the *American Lung Association* to look at decreased lung capacity it was found that high levels of Ozone caused **chromosomal aberrations**.

## Other Issues With Ozone

- Ozone actually ***increases*** total VOC concentration levels in air
- If styrene is present in the air formaldehyde is produced
- Ozone will react with rubber compounds and cause deterioration

## What Are Ozone Limits

Most people develop symptoms within one hour of exposure at levels exceeding:  
0.3 PPM (parts per million)

*“People should avoid using indoor air cleaning devices that produce ozone because they can quickly produce enough ozone in a confined space to exceed California Stage 2 and 3 smog alert levels as well as worker health and safety standards.”*

*California Department Of Health Services*

## Do Ozone Generators Help Control Indoor Air Pollution?

NO, at concentrated levels high enough to destroy viable airborne contaminants, “Ozone” is toxic to humans. OSHA limit for safety is 0.04 parts per million in standard air. Ozone does not remove airborne dust particles, pollen or biological contaminants.

The addition of an “ionizer” is intended to help non-viable airborne particulates attach to stable surfaces. Ionizers have been found to be ***less effective*** than HEPA or other high efficiency filters

The addition of excess ions to the air can:

- Increase serotonin in the body
- Cause irritability
- Cause insomnia
- Cause tension
- Cause stomach distress

## **Ozone: What Air Cleaner Advertisers Don't Tell You**

Frank Hammes, President, IQAir North America  
Santa Fe Springs, Calif.

Every scientific discovery has its watershed moment. In indoor air quality, one of the great watershed moments in the awareness of indoor ozone came in 1983 when a student at the University of Colorado in Boulder wrote a paper for his science class about his summer job.

He titled it "Ozone Toxicity – How Copier Machines Made Me Sick." The student had worked in a small windowless room in the university library. His job was to run off copies for the school's professors. Soon, he developed headaches, a cough, irritated sinuses, and a myriad of other symptoms. Somehow, he got steered in the direction of what was making him sick. The copier machines were creating the lung irritant ozone, the main component of smog.

What no one could have expected was the domino effect that came next. The student took his paper to the local copy shop to have copies printed for his class. The copy shop workers saw the paper and made copies for themselves. Many of them had been experiencing the same problems, but they didn't know what had caused their symptoms.

Soon, copies of the paper started to circulate to other shops that were part of the same national chain of copier stores. As awareness of the issue grew, the copier machines were fitted with ozone filters, ventilation was added to the shops, and copier maintenance companies began to stress the need to maintain the filters properly. The problem was corrected quietly – very quietly.

Today, 21 full years later, it is air cleaners – of all things – that are producing ozone indoors. Last year, an estimated four million air cleaners sold in the United States. Ironically, nearly half of those machines produce ozone.

Ozone-producing air cleaners are being aggressively marketed in the United States. Rarely does a day go by when I do not receive a direct mail advertisement or hear a radio or television campaign for these products. They are being distributed by some of the most well-known and popular retailers of upscale products in the country. Due to the advertising dollars these retailers command, they have even enlisted the nation's leading radio personalities to hawk their wares, including popular stars who personally endorse the ozone-producing products.

The spin that these radio spots and infomercials put on ozone generating air cleaners would be laughable if it wasn't so frightening: "Smell that sweet fresh ozone in your home." "One unit is good for a whole house." "It's nature's way of freshening the air." "These machines are used by the Pentagon." Astonishingly, one ozone-producing air cleaner has even been able to convince a national allergy and asthma support organization into putting its seal of approval onto all of their advertising. A recent trend has been to drop the word "ozone" out of the ads for these machines completely.

This may be because the American Lung Association, the U.S. Environmental Protection Agency and Food and Drug Administration, Health Canada, and just about every other respected health organization advises against using ozone-generating air cleaners. The company using the seal of

approval stresses that it is an electrostatic air cleaner – not an ozone generator – and that it produces only small amounts of ozone as a byproduct.

Truth be told, I'm not able to comprehend any difference between ozone that is created by an ozone generator and ozone produced by an electrostatic air cleaner. The legal limit for both machines in occupied spaces is the same. Ozone is ozone.

The whole situation makes me feel like Howard Beale, Peter Finch's character in the movie "Network." Beale, a longtime television journalist and prestigious anchor of the evening news, makes an on-the-air plea urging viewers to "go to the window, open it, stick your head out and yell, 'I'm mad as hell and I'm not going to take this anymore.'"

**Ozone is a lung irritant. Ozone is an asthma trigger. And yet these machines are being heavily advertised to parents of children who could die from an asthma attack. The manufacturers of these machines have worked hard to create a new concept: safe levels of ozone.**

Well, guess what? **Research has shown that there is no safe level of ozone that can be added to the air.** "Current evidence of the health effects of ozone suggests that there is no safe threshold concentration for the onset of health responses due to exposure above background ozone concentrations," H. Sterling Burnett wrote in 1994.

In the United States, 50 parts per billion is the designated acceptable limit for ozone production in the home. A recent University of Southern California study demonstrated that an increase of ozone by only 20 ppb increased school absences by 83 percent.

**I'm interested to find out if anyone can demonstrate how 50 ppb is the safe level for indoor ozone exposure. It reminds me of the health recommendation that you shouldn't "smoke more than two packs of cigarettes a day." That was the health advice that was being commonly quoted just before the surgeon general's report on tobacco was issued in 1964.**

Prior to that, there was considered to be a safe or even healthful level of smoking. Who thought it was safe and healthful to smoke? Well, primarily the advertisers who were trying to sell you cigarettes – that's who. It is the same situation today. The advertisers who are selling ozone producing air cleaners are spending millions and millions of dollars to convince you that ozone is safe and healthy in your home. They are dead wrong.

We know that asthma is increasing at an alarming rate. Asthma is at its worst in areas that have increased rates of asthma triggers. Ozone is a clearly established asthma trigger. There are daily ozone health watches on the news that warn parents of children with asthma that they should stay indoors on some days; these health watches look at the ozone levels outside. How can someone tell parents in good conscience that the asthma trigger they are putting in their children's bedroom is at a safe level? How has "safe" been established here? Is there a safe number of cigarettes you can have each day? Is there a safe level of secondhand smoke for you or your kids?

The Internet is the soapbox for the angry person with something to say. If you go to the allergy and asthma support Web sites, you are going to find a lot of angry men and women. Mothers and fathers

of children with asthma are posting their experiences with ozone generating air cleaners on the support sites.

On one site for parents of children with asthma, a mother is encouraged by another woman to try one of the ozone-generating air cleaners that are popularly sold on infomercials. The mother responds, "Actually, we tried a [sic] air cleaner that did emit ozone and [daughter] Anaya flared so badly she ended up in the hospital." Another mother tells of getting ionizing air cleaners to help her three daughters with their asthma. All of the girls ended up getting headaches and their asthma situation worsened. A student reporter at Massachusetts Institute of Technology ended up having to go to urgent care after he took the assignment of reviewing an ozone producing air cleaner for the school paper.

Hopefully, awareness of the dangers of ozone producing air cleaners will grow, and changes will come. At press time, I am aware of four class-action lawsuits that have been filed recently against the manufacturers, distributors and retailers of ozone-producing air cleaners.

It's happening. People have gone to the window. They've opened it. They are sticking their heads out and shouting that they are mad as hell, and they aren't going to take it any more.

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