

# COMMERCIAL

## INDOOR AIR QUALITY



# TABLE OF CONTENTS

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|  |    |
|--|----|
| INTRODUCTION   | 3  |
| CHAPTER 1: INDOOR AIR QUALITY AND MOLD   | 5  |
| CHAPTER 2: COMMON FACTORS AFFECTING INDOOR AIR QUALITY   | 8  |
| CHAPTER 3: CONTROL OF INDOOR AIR QUALITY IN HVAC SYSTEMS   | 11 |
| CHAPTER 4: CHANGES IN THE CLIMATE AND INDOOR AIR QUALITY   | 14 |
| CHAPTER 5: THE PURIFIER'S ROLE IN IMPROVING INDOOR AIR QUALITY   | 16 |
| CHAPTER 6: INDOOR AIR QUALITY'S OVERLOOKED IMPORTANCE  | 19 |
| CHAPTER 7: HOW BIPOLAR IONIZATION CAN HELP YOU IMPROVE THE QUALITY OF YOUR INDOOR AIR                                | 21 |
| CHAPTER 8; CONTROLLING INDOOR AIR QUALITY (IAQ) IN COMMERCIAL SPACES   | 23 |
| CHAPTER 9: INDOOR AIR POLLUTION PREVENTION AND CONTROL   | 27 |
| CHAPTER 10: COMMERCIAL HVAC SYSTEMS PROMOTE INDOOR AIR QUALITY   | 31 |
| CHAPTER 11; USING A COMMERCIAL HVAC SYSTEM TO PREVENT MOLD GROWTH  | 33 |
| CHAPTER 12: KEEPING THE INDOOR AIR QUALITY HIGH  | 35 |
| CHAPTER 13: PROVEN TECHNIQUES FOR EXTENDING THE LIFE OF YOUR COMMERCIAL HVAC SYSTEM                                  | 38 |
| CHAPTER 14: A MOLD INSPECTION EXPERT OFFERS TIPS FOR AVOIDING MOLD PROBLEMS AND<br>LAWSUITS IN COMMERCIAL PROPERTIES | 41 |
| CHAPTER 15: RECOMMENDATIONS FOR IMPROVING INDOOR AIR QUALITY IN COMMERCIAL SPACES                                    | 43 |
| CHAPTER 16: FREQUENTLY ASKED QUESTIONS ABOUT INDOOR AIR QUALITY  | 46 |
| CONCLUSION   | 49 |

# INTRODUCTION

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While the basic act of breathing in and out keeps us alive, the quality of our breath is equally vital. Due to the high concentration of allergens and bacteria in the air, each breath we take exposes us to the risk of contracting an illness. This is why you should seek the advice of commercial indoor air quality specialists.

Breathing germ-free air is important whether at home or work. If you run a business, you must ensure that your employees and clients have access to clean air, which is important for sustaining a healthy lifestyle.

When it comes to enclosed locations such as offices and retail businesses, the air quality is significantly lower than outdoors. As a result, you must take the required precautions to guarantee that everyone inside breathes fresh air and does not become unwell often.

A business's success is greatly contingent on its employees' performance. As the proprietor of a firm, it is fully your responsibility to look after the health and well-being of those who work for you.

By providing suitable working circumstances for employees, the performance of the business as a whole can be significantly boosted. On the other hand, if you own a retail establishment, the cramped atmosphere will never attract consumers. Indoor air quality is therefore important for all types of commercial establishments.

Apart from air filtration, HVAC systems also assist in controlling the moisture content of the air. The air begins to retain significant moisture during the cold and humid seasons. Mold and mildew can thrive under these conditions.

If you inhale mold spores over an extended period, you may be at risk of developing major long-term problems. [Commercial indoor air quality](#) facilities eliminate such circumstances, providing you with healthier working conditions.

Florida has some of the greatest if you're seeking effective strategies for maintaining business indoor air quality. Florida Heat & Air can meet all of your air purifying needs. You will be able to enjoy a healthier and more fulfilling life with their aid.

Indoor air quality in commercial buildings <https://flheatair.com> Florida Heat & Air specializes in assisting customers in achieving superior indoor air quality in different venues, including casinos, big department stores, strip malls, hotels, schools, hospitals and health care institutions. For more information, kindly contact us on 866-287-0007.

# CHAPTER 1: INDOOR AIR QUALITY AND MOLD

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Indoor air quality (IAQ) is a word that refers to the air quality inside and around buildings and structures, with a particular emphasis on how it affects the health and comfort of building inhabitants.

Like energy management, indoor air quality is a relatively new sector. Indeed, many of today's IAQ concerns derive from the 1970s' energy-conscious building methods. Structures were designed practically airtight to preserve energy, resulting in ventilation issues and fostering the emergence of some of today's IAQ difficulties.

The ongoing media attention on the health effects of toxic mold, the outbreak of infectious diseases such as swine flu and the rise in chronic respiratory diseases such as asthma have increased interest and focus on indoor air quality in homes, commercial buildings, schools and hospitals.

IAQ can be impacted by microbiological pollutants such as mold and other microorganisms and any mass or energy stressor capable of causing unfavorable health effects. Indoor air pollution is becoming a greater health hazard than outside air pollution.

To determine IAQ, air samples are collected, human exposure to contaminants is monitored, samples on building surfaces are collected and airflow inside buildings is computer modeled. When IAQ problems are raised, two procedures are followed: inquiry and remedy.

Mold investigation determines the presence, degree, and location of a mold hazard within a structure; mold remediation is removing and/or cleaning up mold from an indoor environment.

## Mold As a Causative Agent

According to the National Institute for Occupational Safety and Health (NIOSH), public awareness over Indoor Environmental Quality has increased significantly. This is evident in the quantity and proportion of evaluations of Indoor Environment Quality undertaken by NIOSH over the last two decades.

Underwriters Laboratories, Inc. (UL) has performed a poll to ascertain concern regarding indoor air quality (IAQ). The data indicated that 95% of those surveyed believed air quality was important, up 41% the previous year.

Over 75% of respondents expressed concern about the air quality and possibility for harmful emissions in their homes, offices and other buildings and more than a third expressed extreme concern. Also, the study discovered that 80% of respondents were willing to pay for IAQ testing and modifications in their own houses.

The UL study's findings demonstrate that demand for healthy indoor air quality exists across all construction sectors. Markets for IAQ solutions appear to be notably under-penetrated than their potential, implying huge business prospects.

Also, the UL study discovered that specific markets for IAQ, like Memphis, are five to seven years behind the adoption curve. This demonstrates that IAQ markets in various urban regions are mostly untapped and that the opportunity for IAQ investigations and remediation is substantial.

According to the World Health Organization and the Chelsea Group, a leading provider of consulting services to the engineering, architectural and industrial hygiene industries, approximately 30% of all commercial buildings in the United States and Canada have significant indoor air quality problems and there is no shortage of demand for IAQ

services in the residential and commercial markets. They are predicted to be capable of growing up to five or six times their current size.

According to Mold-Help.org, a non-profit organization dedicated to educating the public about the dangers of indoor mold, over 25 million Americans suffer from allergic reactions induced by indoor mold exposure. Also, in 2005, researchers at Manchester University in the United Kingdom revealed that an allergic reaction to mold often induces severe asthma attacks.

Researchers at Harvard Medical School recently proved the link between asthma and mold. As national asthma rates continue to rise (9.4 percent for children and 7.3 percent for adults, respectively), health-related mold concerns should continue to drive the testing industry.

Also, many have been compelled to abandon their homes, schools, and companies due to the proliferation of indoor molds in the United States and overseas. This, combined with the harmful health impacts of black mold, illustrates the market's urgent need for more accurate and cost-effective techniques for assessing mold levels and exposure in indoor environments.

# CHAPTER 2: COMMON FACTORS AFFECTING INDOOR AIR QUALITY

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You may have heard that indoor air is around five times more contaminated than outdoor air. Because so much emphasis is placed on preventing and controlling outdoor air pollution, indoor air quality issues receive significant attention. This chapter will examine many typical factors affecting indoor air quality that many of you may be unaware of.

## Humidity Levels

Temperature and indoor air quality are inextricably linked. Humidity levels have been discovered to be important in determining indoor air quality. Increased humidity can promote mold formation, which is dangerous to your health.

Also, it's worth noting that controlling indoor temperature is more difficult due to external elements such as heat absorption from sunshine, outdoor air circulation rate and uncontrollable exterior conditions.

## Contaminants

Many contaminants contaminating indoor air are released from sources within a structure, while others are brought in from the outside. Among the most prevalent pollutants are the following:

## Highly Volatile organic Compounds



VOCs are a major contributor to poor indoor air quality. These are primarily organic substances emitted as gases by different goods and processes. Disinfectants, dehumidifiers and cleaning chemicals are all common contributors of VOCs.

VOC pollution from the outdoors comes from chemicals found in contaminated groundwater drawn into indoor spaces during water intake.

### Particles of Matter

Also, both inside and outside, there are particulate particles. It is a mixture of liquid droplets and solid particles in the air such as pollen, smoke, dust, and soot formed due to smoking, fireplaces, and other similar activities.

These particles are inhalable and have a detrimental effect on the heart and lungs. On the other hand, outdoor particulate matter is formed during construction or the combustion of fossil fuels and can easily enter houses via ventilation.

### Monoxide de Carbone

You may not be aware but carbon monoxide is invisible to the senses of smell and sight. If the carbon monoxide content in your indoor environments is low or moderate, it can induce blurred vision, lethargy and chest pain.

Its high quantities might be exceedingly dangerous to your health. Carbon monoxide is produced by inefficiently maintained furnaces, boilers, generators, and vehicular exhaust.

### Inadequate Ventilation

There is no doubt that ventilation is an important component of indoor air quality. It refers to the collection of processes involved in supplying and removing air from enclosed environments.

These procedures bring fresh air into the structure, condition it and disperse it. Even if one or more of these processes are not operating properly, the interior air quality may be impacted.

While periodic maintenance can help keep your HVAC systems running smoothly, you should explore bipolar ionization air purification solutions to ensure a healthy interior environment. These treatments improve indoor air quality by targeting and removing pollutants and airborne viruses.

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# CHAPTER 3: CONTROL OF INDOOR AIR QUALITY IN HVAC SYSTEMS

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Indoor Air Quality, abbreviated as IAQ, is a metric that indicates the purity of the air in a certain area. Maintaining a normal IAQ is important because failing to do so can be detrimental to your health. Hazardous gases, the most prevalent of which is carbon monoxide, affect the rating.

The AQI is a numeric value between 0 and 500. The value is directly related to an individual's health issues. Reduced values are beneficial to the environment, while increased values are hazardous.

A rating of 50 indicates that the air quality is good and poses no health risks. The minimum required value is 100. Any value less than this is OK but any value more than this is detrimental.

Indoor air quality control is important when developing HVAC systems and it must be examined at each step of design and construction. Filtration, ventilation and source control are the basic ways to improve Indoor Air Quality ratings.

Demand-controlled ventilation is a popular way for maintaining acceptable indoor air quality management while consuming less energy. Carbon dioxide sensors measure the amount of gas in the air emitted by building occupants and adjust the air replacement rate accordingly.

Air filters are used to capture a portion of the contaminants in the air. At a minimum, the Minimum Efficiency Reporting Value (MERV) must be 13. The American Society of Heating, Refrigerating and Air Conditioning Engineers established this standard (ASHRAE). Also, the filters reduce the amount of debris that reaches the coils. In the

presence of dust particles, harmful compounds hinder growth. This also affects the system's efficiency.

High humidity creates a perfect environment for the growth of moisture and mold. This results in breathing complications. Although the system must be configured to give air at lower temperatures, this increases power usage.

The air is delivered at higher temperatures to conserve energy in hotter locations. Outdoor temperatures are moderate in tropical locations, obviating the requirement for cooling air indoors entirely. The air supply is an integral aspect of the design and cannot be changed after the process is complete.

Also, the dew point is important in maintaining an appropriate indoor air quality management index. It is when water vapor in the air condenses and becomes liquid water. This method is highly effective at reducing humidity.

Temperatures between 40 and 50 degrees Fahrenheit are suggested. Gas-fired heaters are used with desiccant wheels to dry the atmosphere and achieve the desired dew point temperature. After condensing the moisture, cooling coils are utilized to bring the ambient temperature to the desired value.

Limiting infiltration is often used in business structures and, on occasion, residential units. This method is successful at lowering the air's humidity level. The building's atmospheric air pressure is kept slightly higher than the outside air pressure to minimize infiltration.

When coupled with typical indoor contaminants, ozone produces different harmful compounds. If the rate of exterior ventilation increases, the ozone concentration within increases and more reactions occur.

Even with a low rate, the reactions cannot be avoided entirely. Since the compounds created are capable of causing sickness and death, ozone must be removed during ventilation. This can also be accomplished through the dilution of indoor air.

International environmental and health groups have established many guidelines that must be followed to control indoor air quality and reduce the IAQ value effectively. Outdoor air changes each hour must be a minimum of 2.5.

Carbon dioxide levels must be kept below 1500 parts per million. For small gatherings, the ventilation rate must be three changes each hour. However, this number fluctuates according to the number of individuals.

# CHAPTER 4: CHANGES IN THE CLIMATE AND INDOOR AIR QUALITY

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Recently, the media has focused heavily on air quality. Climate change and rising pollution substantially impact indoor air quality, making it necessary for health-conscious customers to conduct air quality tests. Poor indoor air quality can result in different health problems for persons living or working in a residential or business location.

## Changes in the Climate and Indoor Air

Increases in outdoor pollutants resulting from climate change will also affect inside concentrations. Today's emphasis on cost-cutting results in decreased ventilation, which might result in increased exposure to indoor contaminants. Increased air conditioning use in response to rising temperatures, combined with highly insulated buildings, can increase exposure to toxins generated within.

## Changes in the Climate and Allergies

Mold and ragweed, two of the most common allergies in the United States, have been related to shifting weather patterns. Over the last four years, mold sensitivity has increased by 13%. Mold, which is heavily impacted by precipitation, is extremely harmful to humans and often establishes a foothold in houses with moist, warm air.

## Changes in the Climate and Respiratory Disease

Due to climate change, significant increases in mold spores and other allergens harm public health. Mold, in particular, is associated with an increase in the prevalence of asthma, rhinitis and other chronic respiratory disorders. Due to the prevalence of mold in wet, enclosed locations, an indoor atmosphere provides an ideal breeding habitat.

## Improving Indoor Air Quality in a Changing Climate

With projected increases in temperature and precipitation, it is important to ensure that your home is well ventilated and that your HVAC system is in good operating order.

It is important to have professional inspecting ducts for dust, grime, and mold growth in humidifiers, ducting, and other systems. Eliminating standing water from clogged drains and identifying areas of high moisture content will go a long way toward improving your indoor air quality.

The most effective strategy to improve indoor air quality is to have your house or business analyzed and serviced by a qualified professional air quality testing firm. Apart from recognizing common ductwork and condensation problems, a specialist can ascertain the source and scope of the problem and recommend multi-faceted solutions that will reduce your overall exposure to airborne irritants.

These remedies may include correcting poor building materials or design, constructing drains or pumps, installing dehumidifiers or air purification systems and cleaning and refurbishing ductwork.

# CHAPTER 5: THE PURIFIER'S ROLE IN IMPROVING INDOOR AIR QUALITY

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We cannot ignore the important nature of a clean work environment. Employees may become ill in the workplace due to germs, bacteria and pollutants flying through the air.

If the air in your workplace is contaminated with these toxins, you can clean it by installing air purifiers and air scrubbers. Let's examine how you might increase the quality of your indoor air.

The dangers of contaminated air

You may not notice any visible dust or dirt particles in the air at your office. In actuality, indoor air is densely packed with different harmful microscopic particles. Breathing this dirty air can result in different health concerns, including difficulties breathing, coughing, colds, skin irritation and sore throat.

Proper air circulation is important in an office or workplace. Apart from that, the temperature and humidity levels should be optimal. If the humidity and temperature levels are not optimal, your employees may experience respiratory problems. Prolonged exposure to polluted air may potentially contribute to the development of lung cancer.

Make use of air purifiers and scrubbers.

Thus, the question is how to clean your interior air properly. To begin, you should ascertain the air quality in your workplace. Special sensors can be installed to determine the airborne contaminants present. Apart from that, air purifiers and air scrubbers can be utilized to purify the air.



## Air Scrubbers

An air scrubber is a portable device used to filter the air in a workplace. These devices are extremely successful at removing microscopic airborne particles and pollutants.

## Air Purifiers

The advantage of air purifiers is that some of them include HEPA filters. These specialized filters can filter 99.97 percent of airborne particles potentially detrimental to human health.

## Dehumidifiers

As the name implies, a dehumidifier assists in lowering the relative humidity level in the area in which it is situated. Also, dehumidifiers convert the captured moisture to water via the condensation process. In any workplace, the humidity level should be comfortable for personnel.

What makes a HEPA filter so unique?

Compared to standard air purifiers, those equipped with HEPA filters are more effective in capturing even the tiniest airborne particles. They are constructed with multiple layers of netting to effectively trap microscopic pollution particles in the air.

These airtight filters have thick fiber sheets. As a result, HEPA filters are capable of filtering out the coronavirus. As a result, it is preferable to get an air purifier equipped with HEPA filters.

## Air purifiers for home use vs. industrial air scrubbers

Certain characteristics distinguish industrial air scrubbers from consumer care purifiers. Commercial units are equipped with powerful motors, installed over a vast area. It is important to remember that while their scrubbers do filter out coronavirus, they cannot prevent the virus from being transmitted from one person to another.

In short, you can use an air scrubber or an air purifier to ensure that your workplace or office environment is pollution-free.

# CHAPTER 6: INDOOR AIR QUALITY'S OVERLOOKED IMPORTANCE

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Indoor air quality management is a significant topic in the commercial and residential construction industries (IAQ). Often ignored, IAQ refers to the air quality in and around a home or structure, emphasizing the occupants' health and comfort.

Poor air quality has been related to different negative health impacts, ranging from slight irritation of the eyes, nose and throat to far more serious conditions such as respiratory disorders and some types of cancer. Many builders have recognized the important nature of keeping clean, living air.

Until recently, most IAQ research and attention have concentrated on a long-standing "big-three" combustion from heating/cooking, formaldehyde and radon. However, as the detrimental impacts of poor air become more known, it is obvious that far more pollutants are prevalent.

Mold and mildew are significant contributors to poor indoor air quality, as are off-gassing, dust mites, animal feces and asbestos. These variables might compound to have a detrimental influence on health. The EPA just issued their research findings, boldly asserting that up to 50% of illnesses originate in the home.

Fortunately, many activities and actions may be taken to alleviate the impacts of poor indoor air quality. To begin, avoiding water penetration into one's home is important for preventing mold growth.

Builders did not understand how to keep moisture out of a home until the 1980s, leaving many older homes prone to water intrusion and mold problems. Fortunately, different mold-killing and mold-prevention products are now accessible.

AfterShock is the first mold-resistant coating registered with the Environmental Protection Agency. Aftershock is an interior wall and surface treatment that eliminates existing mold and produces a barrier that keeps mold away from applied surfaces.

However, mold management alone is insufficient. As important as keeping water and mold out of living rooms is sourcing your air from locations unlikely to suffer from bad IAQ. Many older structures obtain their air via untreated crawl spaces or basements, which may contain mold, germs and different other contaminants.

The EPA estimates that people spend around 90% of their time indoors; combined with inadequate IAQ, this factor may account for a significant portion of the 17 million Americans who have asthma. Chemical sensitivities, in addition to respiratory difficulties, are becoming more prevalent.

Certain forward-thinking builders are beginning to avoid goods made with formaldehyde-based resins in favor of non-toxic alternatives. Modern homes breathe and many people who have moved to non-toxic building materials report fewer ailments; this is especially true for those with chemical sensitivity.

Builders who specialize in healthy houses and place a premium on maintaining a high standard of indoor air quality are light years ahead of the competition. An emphasis on healthy building has evolved into a competitive advantage and will only continue to increase in importance.

# CHAPTER 7: HOW BIPOLAR IONIZATION CAN HELP YOU IMPROVE THE QUALITY OF YOUR INDOOR AIR

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Even while modern homes are designed for energy efficiency, they often lack an adequate and healthy ventilation system, majorly worrying those concerned with maintaining indoor air quality.

Despite public health campaigns and efforts to curb outdoor air pollution, indoor air quality concerns are often disregarded. Indoor air quality should be maintained in commercial places such as schools, offices, hospitals and other facilities, as this is where most of us spend most of our time.

Here, we'll examine how bipolar ionization technology works to improve and purify the interior environment and some of the incredible health benefits associated with it.

## The Mechanism of Bipolar Ionization

Similar to how sunshine operates in the atmosphere, bipolar ionization technology assists in the creation of a natural bioclimate in enclosed spaces rich in both positive and negative oxygen ions. Since negative ions possess an additional electron than positive ions, this might create an unstable environment.

By releasing these bipolar ions into the airways, they seek out molecules with which to exchange electrons. This contributes to the neutralization of bacteria, particulate matter, odorous odors and virus cells present in the atmosphere, resulting in cleaner, healthier air.

Bipolar ionization devices can be retrofitted or incorporated in new HVAC equipment. They are installed in air handlers or supply ducting and employ proactive air purification methods to neutralize airborne pollutants and viruses.

The following stages illustrate how these systems operate:

- Within the ionization tube, oxygen from the air is charged to produce ions.
- These ions are attracted particles in the air, such as smoke, dust, allergens, VOCs and other pollutants.
- Once released, these ions latch onto and neutralize contaminants. Also, these systems break down VOCs and smell so they can be neutralized.

#### The Health Advantages of Bipolar Ionization Air Purification

According to the United States Environmental Protection Agency, indoor air can be two to five times more contaminated than outside air. These ionization systems can help remove around 95% of toxins and pollutants from the air in your homes and businesses.

Since these air purifiers aid in the breakdown of harmful bacteria and mold and the removal of particulate matter such as pet dander and dust, they also aid in the alleviation of allergy and asthma symptoms.

The advantage of bipolar ionization solutions is their ease of installation. Also, some versions are portable and include boxed units and independent towers. In contrast, others may be placed into the ductwork of a central HVAC system with the assistance of professional experts.

# CHAPTER 8; CONTROLLING INDOOR AIR QUALITY (IAQ) IN COMMERCIAL SPACES

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Inaction is a liability when sick structures become increasingly evident. This situation prompts the following question: "Will you be prepared when dissatisfied tenants, reporters and attorneys arrive at your building?" As part of a comprehensive preventive due diligence program, an IAQ audit can demonstrate good faith and quality management.

## Making the news

Most well-publicized occurrences involving IAQ issues have involved moisture and microbiological contamination. For example, a New York Library branch staff complained of respiratory disease. Even though the library had recently undergone a major refurbishment, basement water issues persisted.

A consulting firm was hired to investigate and they discovered a mold called *Stachybotrys atra*, which has been linked to multiple sick buildings. However, the precise health implications of this mold remain unknown.

The structure was shuttered and alternative library locations were considered. Two additional branches were shuttered as a result of these additional investigations.

## Audit of indoor air quality

An IAQ audit is a periodic examination of an IAQ program to follow practices and procedures. In its simplest form, it entails a visual evaluation of the building and the components of the HVAC system. This inspection is included in a more complete audit, as is a study of a building's:

- Design documents
- Training program
- Documented IAQ strategy, including policies and procedures
- Ongoing documentation, such as complaint reports and maintenance records

Fortunately, many excellent resources are available to assist with the audit process. The EPA's Building Air Quality guidance paper offers blank audit forms that can be used to structure and execute an audit for commercial buildings.

The EPA's IAQ Tools For Schools advice kit offers audit-ready checklists for educational buildings. On page 9, an audit template is included, although any checklist used should be adjusted to the unique demands of the building.

A common legal circumstance

There are no legally defined standards for "excellent" indoor air quality in terms of HVAC system design, operation and maintenance or limiting indoor air contaminants. What should maintenance and engineering managers do in the absence of definite criteria to ensure a healthy indoor air environment?

Managers should conduct themselves following industry standards developed by organizations such as the [Environmental Protection Agency](#) (EPA), the Occupational Safety and Health Administration (OSHA) and the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE), as the courts rely on these sources.

Managers' legal exposure to IAQ litigation will be reduced if they demonstrate that they are making a good faith effort to manage their facilities following prevailing standards.



How do managers demonstrate to a judge or occupier that such an attempt is being made?  
Documentation is important.

Building audits are an important practice that managers should follow continuously throughout the building management process. Apart from assuring adequate IAQ, audits can generate the paperwork essential to establish good faith IAQ efforts. A thorough building audit demonstrates to management that the structure and its components have been inspected for existing concerns.

Regular building audits, like routine medical examinations, are preventative. They imply a conscientious, rather than indifferent, management style, which can help avoid legal liability.

#### Improvement of air quality

Maintenance and engineering managers must continually exceed occupant expectations and demonstrate that a determined effort is being made to maintain appropriate indoor air quality. This is essentially the concept of continuous quality improvement applied to buildings: the process of air quality improvement.

An IAQ audit can be an effective tool for identifying the areas in which management should concentrate its efforts. IAQ audits can identify prospective areas of concern, places where preventive measures are effective, areas that need the adoption of policies and procedures and areas that need additional staff training.

#### Tips for implementation

The most effective initiating an audit program will depend on the facility's in-house maintenance and engineering capabilities. Suppose a building's staff is properly trained in IAQ and is familiar with buildings and HVAC systems. In that case, managers can create a checklist specific to the facility and conduct audits regularly - at least once a year.

If no in-house knowledge exists, a [consultant can conduct the audit](#). Appropriate staff should accompany the consultant throughout this third-party audit to learn how to conduct the audit themselves. Photographs may be beneficial for documenting observations of the building and HVAC system.

The auditing procedure and the following observations can be an invaluable teaching tool for anyone assigned with IAQ responsibilities.

Following an audit, the auditor should advise members of the IAQ team on the findings and recommendations. Managers should maintain the completed audit checklist for future reference and handle any issues that need remedial action, documenting the procedure in the process. With the increased visibility of sick buildings, inaction is a liability. After all, you never know when your indoor air quality (IAQ) will make news.

# CHAPTER 9: INDOOR AIR POLLUTION PREVENTION AND CONTROL

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Many issues with indoor air quality have surfaced as a result of energy-efficient measures such as tightly constructed spaces, increased insulation and insufficient ventilation. When a building's fresh air supply is reduced, the indoor environment becomes conducive to accumulating toxic substances.

Other known sources of indoor air pollution include the design of your HVAC system, the materials used to manufacture items and the furniture brought into the building by people.

We'll look at some effective tips for reducing indoor air pollution in this chapter, which will help prevent serious health complications.

## Prevention and Control Techniques

Here are six steps to take to prevent and control indoor air pollution caused by the factors listed above:

### 1. Have the Indoor Air Quality of Your Home Tested

The only way to determine whether contaminants are present in your indoor spaces is to have your air quality tested. Professional indoor air monitoring can assist you in determining whether your home or commercial space contains pollutants such as radon (a naturally occurring gas).

## 2. Improved Ventilation

Since inadequate ventilation can harm indoor air quality, you should consider installing a kitchen or bathroom ventilation system to expel stale air and excess moisture outside. Consult your HVAC supplier about installing a ventilation system that will remove stale air from your home and replace it with fresh air.

## 3. Make the Most of High-Quality Air Filters

If you consider using fiberglass air filters, you should understand that they will not protect your indoor spaces from dangerous contaminants. You should invest in high-quality pleated filters with a Minimum Efficiency Reporting Value of 5-8. These filters will protect the furnace from dirt and trap smaller particles that may enter your home.

Also, remember to have your air filters changed every three months if your home has a high level of pet dander and other pollutants.

## 4. Minimize Chemical and Toxic Substance Use

Also, you must take steps to minimize your reliance on chemicals. Always read the labels before purchasing chemicals and store them away from occupied areas. Also, you should air out your dry-cleaned garments before bringing them indoors.

## 5. Add an air purifier or ionizer

Also, you can invest in a whole-building air cleaner and ionizer to keep your indoor air clean and healthy for the occupants.

## 6. Keep House Plants

Also, it is recommended that you keep particular types of potted plants in strategic locations throughout the house to absorb dangerous toxins. The Gerbera Daisy, English Ivy, Spider Plant and Peace Lily are just a few of the greatest.

It is not incorrect to state that indoor air quality is a shared duty that is mostly dependent on the design of your building's environmental control system.

# CHAPTER 10: COMMERCIAL HVAC SYSTEMS PROMOTE INDOOR AIR QUALITY

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Maintaining a healthy indoor air environment is an important function of any commercial HVAC system. There is little you can do to avoid inhaling smog, allergies, airborne bacteria, or contaminants outside.

However, once inside your building, you have the freedom to choose the type of air you wish to breathe. It is well believed that breathing clean, filtered air is healthy. Inhaling indoor pollutants and chemicals in common household cleaners can have repercussions on long-term health.

This is why it is important to regularly maintain and change the air filters on your commercial HVAC system. Proper ventilation can also assist in reducing the concentration of lung irritants.

Even in densely populated cities, indoor air is often more polluted and hazardous to human health than outdoor air. The vast majority of people spend most of their time indoors. Whether renters or employees occupy your facility, you should assist in mitigating these health hazards by keeping the air they breathe clean.

If your employees are regularly exposed to harmful materials and supply suitable breathing filters, you should maintain your commercial air conditioning unit to filter the indoor air.

If a building is utilized as a factory or warehouse and generates dust or particles that can gather in the air, air filters should be changed more often than in any other context. Young children, the elderly and individuals with certain ailments such as heart disease or

respiratory difficulties are particularly vulnerable to the effects of breathing filthy indoor air.

Each day, your business HVAC system must be capable of filtering a wide variety of pollutants from the air. Allowing smoking in a building can significantly increase indoor pollution.

Every day, household cleaners, furnishings, dust, grime, mold, bacteria in the air, fumes from paints, asbestos-containing insulation and even furniture can emit toxins. Indoor pollution is primarily caused by oils, kerosene, wood, coal and gases.

Indoor air pollution can be caused by dirty business air conditioning and ventilation ducts and systems, insufficient commercial HVAC maintenance and improperly positioned outdoor air intakes.

Regular maintenance of the business HVAC installation, management of indoor pollution sources, increased air ventilation throughout the facility and use of air filtering devices can all help prevent health problems. Opening windows can assist in mitigating unexpected rises in interior air pollution. Keeping air supply vents free might also improve indoor air quality.

Many of the long-term health consequences of poor indoor air quality become apparent years after exposure to the pollution. Keeping indoor pollution levels low is the only way to prevent your employees or tenants from developing long-term health concerns due to poor indoor air quality. Individuals living and working in high-quality, clean air facilities are happier, healthier, and more productive.

# CHAPTER 11; USING A COMMERCIAL HVAC SYSTEM TO PREVENT MOLD GROWTH

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Any type of air conditioning system can contribute to mold formation indoors. A business HVAC system can transport mold spores through piping and disperse them throughout the facility.

Damp drainage pans can become breeding grounds for mold and if the surrounding surfaces are not adequately cleaned and maintained, the mold can swiftly spread throughout the building.

Air conditioning repair technicians and HVAC engineers should always be aware of the hazard mold poses to a structure and its occupants and take the necessary precautions to ensure it cannot harbor mold.

Indoor mold is typically only noticed when it is visible, more concentrated or a different sort of mold than that found outside. Mold needs moisture, nutrients, and a precise temperature range to thrive. Unfortunately, the interiors of buildings provide an abundance of fuel for mold growth.

Mold can flourish on the carpet, paper, cardboard, fabric, wood and even drywall. The temperature range that most people keep their buildings within includes some ranges where mold can thrive. To avoid the growth and spread of mold spores, a commercial HVAC system must always effectively control interior humidity.

Indoor moisture content can be the difference between a mold-free and a mold-infested indoor environment. Indoor mold development can irritate occupants' lungs and is a significant source of respiratory difficulties and sickness.



Air conditioning service professionals should assist in maintaining a suitable indoor air temperature, but they should also assist in reducing moisture. Mold can be eliminated using specific mold cleaners, biocides and fungicides. However, eliminating the existing mold does not eliminate the root of the problem.

Mold spores within a business HVAC system can significantly impact a building's indoor air quality. It is important for air conditioning technicians to take a proactive approach to the situation before it worsens.

The mold issue is complicated because there are now no federal standards governing mold levels and remediation techniques. Certain states have enacted legislation addressing the issue but not all have. Those who are currently controlled by the state may license mold remediation experts.

When mold is detected, it often suggests that the building's ventilation system is inadequate and the dehumidification process is ineffective. However, redesigning the building to lower mold levels is not viable in most cases.

Poor HVAC design is among the most common causes of mold spread throughout a structure and should be assessed regularly. Drain pans and coils should be kept dry to avoid creating an environment conducive to mold growth.

Equipment for humidification and dehumidification should be cleaned and treated regularly and excessive moisture should not be allowed. Air filters in central air conditioning systems should be updated regularly and fit snugly. Mold levels can be decreased and even eradicated by following specific preventative steps, resulting in healthier indoor air.

# CHAPTER 12: KEEPING THE INDOOR AIR QUALITY HIGH

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Indoor air quality is important in all industries, not just those using many chemicals. Any huge job in today's polluted world must be checked for air quality. HVAC ventilation technology has advanced significantly over time.

New central heating and air conditioning solutions have arisen to address emerging conditions such as data centers and indoor pools. The Denver Museum of Fine Arts hired a Denver HVAC business to construct UV filters that eliminate alien germs in displays. These technologies are spreading throughout the heating, ventilation and air conditioning industry.

However, when times are tough, people do stupid things. There have been reports of consumers delaying the replacement of their Denver air conditioner filters. These individuals may not comprehend that filter replacement is more cost-effective in different ways.

Duct cleaning is a common service that cleaning businesses in Florida provide. The service is provided to commercial and residential clients. Industry specialists and seasoned corporate personnel often carry them out.

This service is important in indoor air purification and maintaining a contaminant-free work and residential environment. This directly affects the ducts being sanitized and disinfected during regular maintenance.

The temperature in ducts and furnaces is often conducive to the formation of bacterial spores and the collection of dust and filth. Heating, ventilation and air conditioning

systems often emit this contaminated air into residential spaces via their paths and outputs.

In offices and homes, unmanaged and unclean ducts spew impure and unhealthy air into the living space and work areas, resulting in respiratory and internal health problems. As a result, HVAC systems' ducts, air tubes, and outlets must be cleaned frequently and regularly.

The service includes comprehensive cleaning and maintenance of the heating, cooling and temperature modulation systems. They are important for the proper operation of indoor systems. As a result, duct repair services contribute to indoor air quality improvement.

The company's professional personnel provides a multi-tiered maintenance method for HVAC-based systems. To begin, the specialists thoroughly sanitize the ducts with eco-friendly sanitizers.

Only environmentally conscious professionals and service providers utilize eco-friendly solutions such as citrus-based cleaning products. Following that, the specialists cleanse and deodorize the HVAC systems.

Appropriate and timely maintenance services significantly improve indoor air quality. The air is purified of all contaminants, dust and filth. Even bacterial spore growth is significantly inhibited in warm passageways.

A clogged filter forces the machine to work harder to move the same quantity of air, resulting in higher energy expenses and shortened system life. A replacement filter is typically substantially less expensive.

Commercial clients typically do not experience the same issues as residential customers, who may be unaware that their system contains a filter. Businesses and large buildings typically have their building managers or contracts with a Denver HVAC provider.

Residential buildings have begun to install high-efficiency air filters. Companies incorporate the filters as part of a typical upgrading package for indoor air quality. Bundling the filters is an effective strategy for convincing customers to accept new technology that benefits both sides.

Along with energy savings, contractors have been promoting filters by educating consumers about the dangers of breathing filthy air and the resulting respiratory problems. A blower must circulate the air when the customer uses the vent without heating or cooling.

While industrial clients should already have adequate ventilation, other clients may need education on the benefits of air movement and the control mechanisms used by HVAC systems - whether a thermostat, programmable fan or custom air conditioning company installed controls.

# CHAPTER 13: PROVEN TECHNIQUES FOR EXTENDING THE LIFE OF YOUR COMMERCIAL HVAC SYSTEM

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Heating, ventilation and air conditioning systems are important components of maintaining a comfortable indoor atmosphere in any commercial structure. Because they operate continually to maintain interior air quality, they can be extremely expensive in terms of energy bills, not to mention the cost of repairs and maintenance.

If you want to save money on general maintenance, you must establish a strategy for extending the life of your HVAC system and ensuring that it operates smoothly and efficiently. This chapter will look at five measures you should implement into your business HVAC system's maintenance regimen to ensure it lasts long.

## Replace Filters Often

While the technician is responsible for checking your filters at the twice-yearly maintenance, you are responsible for ensuring they are replaced regularly. Filters that are clogged make your HVAC system work harder to circulate air throughout the space, resulting in major difficulties.

If you discover that your air filters have become significantly blocked and dusty, even if it is ahead of time, you should replace them immediately.

## Conduct a Visual Inspection of the Heating Components

Many heating components in your HVAC unit must be inspected since they may constitute a major fire hazard if not installed properly. When attempting to extend the life

of your HVAC system, the last thing you want is for it to catch fire. This can also pose a significant health danger to your staff, so you must use extreme caution.

Ensure that you inspect all gas/oil connections, heat exchanger, burner combustion, and gas pressure. If you discover any signs of damage or leaking, contact the technician immediately so they can address them before they become a problem.

### Invest in Better Insulation

It's a well-known fact that the fewer often your HVAC system runs, the longer it will last. When it comes to managing the indoor air quality of any place, insulation is your best friend. You should schedule a professional energy audit to determine your insulation system's overall effectiveness and identify any weak points.

If your commercial space is insufficiently insulated, you should consider adding more insulation to the wall cavities and insulating the basement.

### Examine Your Ductwork

You should have your ductwork evaluated at least once a year since approximately 30% of cooled or heated air leaks out of the average duct, resulting in the air ending up in the crawlspace rather than where it should be.

This increases the workload on your HVAC equipment and reduces its lifespan. If bug droppings, debris or dust are found in the ducting, it must be cleaned immediately. Gaps, holes and other evidence of deterioration should be repaired immediately to save money in the long term.

### Utilize the "Auto" Fan Mode

Most thermostats have two fan settings, one of which is labeled 'Auto.' The fan only functions when your HVAC unit actively works to maintain your room's desired

temperature or humidity level. Using the 'Auto' Fan setting may help extend the life of your system's blower, whereas the 'on' setting will run your blower continually.

There is no doubt that if you look after your HVAC system, it will look after you. To get the most out of your business HVAC system and ensure it lasts longer than the industry standard, add these five actions into your normal maintenance and observe the difference.

# CHAPTER 14: A MOLD INSPECTION EXPERT OFFERS TIPS FOR AVOIDING MOLD PROBLEMS AND LAWSUITS IN COMMERCIAL PROPERTIES

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As commercial property owners and managers around the eastern shore transition from hurricane preparation to clean-up, many realize their structures have been flooded. If left unchecked and untreated, water incursion will result in microbial contamination or mold growth.

Residents in buildings with elevated mold levels may experience major health problems. Building owners and managers are legally and ethically responsible for maintaining safe indoor air quality for residents and employees.

Three practical pieces of advice for commercial property owners and landlords dealing with flood damage are as follows:

1 - Inspect the building immediately for plumbing pipes, roof, and siding leaks. Examine the building for signs of water intrusion. Mold problems that go undetected might deteriorate where intensive treatment is the only option. However, with a quick diagnosis, the only response that may be required is a thorough cleaning, drying and possibly some minor building repairs.

2 - Hire a mold expert to thoroughly inspect the structure. Porous construction materials are particularly prone to deterioration due to absorbing water and contaminants. Mold spores germinate within a few days and can swiftly escalate into a serious problem.



A mold expert is equipped with the technology and training necessary to analyze apparent and hidden symptoms of water penetration and mold growth throughout the structure, including each room on each floor, crawl spaces and basements and HVAC ducts, both inside and out.

You will receive a written mold evaluation but you will also receive recommendations for resolving any detected concerns.

3 - If the mold inspection identifies any mold problems, take immediate remediation action. While attempting to conceal or camouflage water damage with paint may be tempting, the odor will quickly become unbearable and the problem will not resolve itself.

Worse yet, the indoor air quality will deteriorate and become increasingly dangerous for the building's occupants. Failure to remediate exposes building owners and managers to lawsuits and the risk is never worth the reward.

While flooding is among the most obvious causes of mold growth, many others include broken or leaky pipes, faulty or clogged gutters, malfunctioning appliances, leaks in roofs or siding, and structural or sealing flaws in a building and vapor barrier defects. Building management best practices include conducting a routine indoor air quality inspection, which should include a mold inspection.

# CHAPTER 15: RECOMMENDATIONS FOR IMPROVING INDOOR AIR QUALITY IN COMMERCIAL SPACES

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It's no secret that indoor air quality has developed into a major environmental concern globally. With the increased use of synthetic materials, the development of compact spaces and energy conservation efforts in recent years, there is an urgent need to conduct preventative and control measures for indoor air pollution.

Because individual comfort criteria vary, it takes a lot of research and monitoring to maintain air quality guidelines. It is impossible to satisfy all of a building's residents. Individuals may be more susceptible to health difficulties due to environmental variables than others in any structure.

Consider some principles for improving air quality in offices and residences that building owners must follow to provide healthy living and working environments.

## Recommendations for Improving the Indoor Air Quality of Commercial Spaces

### 1. Creating an HVAC System That Maintains Clean Indoor Air

You must ensure that your HVAC system is designed to circulate a constant supply of clean, fresh outdoor air throughout the building and to maintain thermal comfort for the occupants. Also, you should ensure that high-performance exhaust fans have been installed to remove toxins and odors from indoor air or dilute them to appropriate levels.

### 2. Ascertaining there is the adequacy of outside air

Every environment needs an adequate supply of outdoor air, which is normally circulated via the HVAC system. It assists in diluting toxins emitted by furnishings, cleaning products, construction materials, and even HVAC equipment.

Ascertain that your HVAC system distributes ventilation air to all inhabited spaces to provide a comfortable living and working environment for the building's occupants.

### 3. Space Planning with Indoor Air Supply in Mind

The furniture and necessary equipment arrangement can also affect the air circulation within an occupied room. For instance, installing a heat source (a computer) beneath your thermostat may cause your HVAC system to give excessive cool air since the thermostat will detect an excessively warm indoor environment.

You must pay close attention to indoor airflow and ensure that any partitions or furniture obstructing air supply are properly located.

### 4. Filtration of Outdoor Air Pollutants

Pollen, dust, and carbon monoxide significantly affect the indoor environment and often enter the building via ventilation systems. You must ensure that air filters are placed appropriately and maintained throughout your facility to prevent harmful particles from entering your indoor spaces.

Contact a professional service to control chemical or gaseous pollutants, as they may need more complicated filtration equipment.

### 5. Eliminating Pollutant Transport Routes

Contaminants can quickly spread throughout indoor environments via paths such as stairwells, wall cavities and elevator shafts. To control these pollution pathways and protect indoor air, you must implement specialized ventilation methods.

## 6. Keeping HVAC Equipment in Good Condition

There is no doubt that maintaining your HVAC equipment properly is important to ensure an adequate supply and quality of indoor air. Preventive maintenance programs are necessary to ensure that your HVAC systems operate correctly.

While many reasons contribute to indoor air pollution, most of these concerns may be resolved or prevented by implementing efficient measures and engaging professional assistance.

# CHAPTER 16: FREQUENTLY ASKED QUESTIONS ABOUT INDOOR AIR QUALITY

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Both outdoor and indoor air pollution are major problems that must be addressed immediately to avoid future health difficulties. On the other hand, indoor air quality can influence us since we spend most of our time indoors.

There is no doubt that poor indoor air quality and the associated concerns can result in different health problems. Short-term exposure may cause cold-like symptoms such as eye, throat and nose irritation, headaches, and dizziness. Prolonged exposure to air contaminants can cause respiratory problems, cardiovascular illness and even lung cancer.

This chapter will look at three of the most common concerns you'll need to solve to maintain the acceptable indoor air quality in your homes and commercial spaces.

## Insufficient Ventilation

Indoor environments, by definition, do not benefit from the same level of natural ventilation as outside ones, which is why mold and pollutants can easily accumulate within. This can result in stale indoor air and reduce the efficiency of your HVAC system.

Also, inadequate ventilation might increase pollutant concentrations, resulting in cold-like symptoms. It's worth noting that radon exposure is also a severe risk in some places. Radon is produced through the decomposition of soil and underground rocks. It can quickly seep into homes through foundation gaps.

Radon concentrations can build up over time in poorly ventilated indoor environments. If you were unaware, radon is a known carcinogen that has been linked to lung cancer.

### Airborne Contaminants

The activities we engage in and the pets we welcome into our homes can increase the number of toxins affecting indoor air quality. If we do not manage these activities properly, they can result in many health problems for the residents.

Contaminants can be introduced into your indoor air supply through the following activities:

- Smoking indoors
- Painting the walls
- Cooking
- Keeping pets
- Using the fireplace
- Using candles
- Using cleaning goods for domestic duties

It's important to remember that elevated levels of pollutants in the air are particularly damaging to residents who suffer from asthma or allergies, aggravating their symptoms.

### The Humidity Levels Are Excessively High

High humidity levels are a common source of poor indoor air quality. If the air in your home or business feels stuffy, you may have a humidity control problem. High humidity environments are ideal for allergens and mold to grow and thrive. Excessive moisture exposure can result in the following:

- Skin irritations
- Eye irritation
- Nasal congestion
- An increase in allergy symptoms
- Asthma episodes
- Lung infections

Suppose you are experiencing any of the concerns listed above. In that case, you should look for air purification solutions that can assist in resolving these issues and fostering a safe and healthy indoor atmosphere.

# CONCLUSION

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Air quality in buildings is important for different reasons, including health, productivity and safety. The first two factors – health and productivity – are well-documented and well-known. However, safety is the least well-known and thus the subject of this essay.

Clean air is not accomplished by chance but rather due to building owners and management collaborating and agreeing to incorporate clean air into the safety program. Building owners and managers must prioritize clean air and develop elaborate policies, action plans, and training requirements to support clean air operations.

When building owners and managers examine indoor air quality, their thoughts immediately turn to the HVAC system and accompanying air-handling devices.

While these systems are important, they are not the main emphasis for healthy indoor air in buildings. Other aspects affecting safety should be considered, including pesticide use, water/mold bacteria and viruses. These are the key safety concerns affecting air quality.

Given the breadth of safety concerns, it's all too easy for building owners and managers to overlook indoor air quality issues. However, disregarding air quality carries its own set of concerns. The danger is twofold. To begin, someone could become ill or wounded due to poor indoor air quality, which leads immediately to the second issue - litigation.

Nothing is more concerning to property owners and managers than lawsuits. While air quality and safety litigation cannot be completely avoided, management data can be used to bolster or refute the plaintiff's allegation - the building owner makes the call.

To avoid being classified in the former group, the owner must demonstrate basic indoor air management principles. These essentials include developing a "written" air quality



policy, scheduling an independent policy evaluation, and communicating the review's findings to owners and management.

Finally, owners and managers should take a moment to reflect on a few key points.

How often is the air management strategy implemented: quarterly, monthly or in segments daily?

Is building management in contact with building staff/occupants to establish expectations around chemical use, water/mold bacteria and viruses?

Do the building's safety procedures and plan contain a means for correcting them?

Are revisions communicated during the policy review session?

Suppose you are a building owner or manager and cannot answer the above questions. In that case, I recommend that you contact a [local indoor air quality professional](#) to evaluate your current air quality management practices or contact Florida Heat & Air at 866-287-0007.or <https://flheatair.com/> for a personal consultation.