

# NEMI NEWS

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## IAQ – New Opportunities for Contractors & Technicians

**A** new, exciting and lucrative business opportunity is on the way for union sheet metal contractors and technicians—indoor air quality audits and retrofit work.

Across the nation, complaints about poor indoor air quality are on the rise, and building owners and managers increasingly are in need of indoor air quality services.

Occupant complaints coupled with abnormal absenteeism, high turnover rates, and flu and cold epidemics have employees, employers and building owners and managers concerned about “tight building syndrome”—buildings with poor indoor air quality (IAQ) that cause occupants to feel ill.

Government and private investigations have traced the majority of complaints about poor indoor air to inadequate or improper ventilation. Some studies estimate that as many as two-thirds of all indoor air quality complaints are the direct result of poor ventilation.

With their unique experience in both energy management and HVAC installation and maintenance, NEMI sheet metal contractors and technicians are well suited to enter this rapidly growing field.

With NEMI-provided training, sheet metal workers will learn the additional skills that will enable them to offer IAQ services. NEMI's IAQ specialists will be able to analyze building air quality and then perform the retrofit work necessary to achieve the critical balance between high air quality and energy efficiency. NEMI will also provide the same warranty and marketing

support that has made NEMI a leader in the field of energy management.

Union contractors and technicians who offer both IAQ and energy management services will be providing a unique combination of building services that will be in great demand as building owners and managers increasingly realize the magnitude of

tight building syndrome-related problems.

To help NEMI members gain a better understanding of tight building syndrome, this issue of "NEMI News" presents detailed information about indoor air pollution. Any questions concerning indoor air pollution or NEMI's IAQ program may be directed toll-free to Frank Powell, Program Director, at 1-800-458-6525.

### Signs of a Tight Building

*Telltale signs of a potentially tight building include:*

- Visible dirt and soot surrounding air intake vents or on return air grills
- Intermittent odors
- Excessive dust accumulation on desks and furniture
- Visible and lingering tobacco smoke or smoke from cook stoves and grills
- Uneven temperature zones within offices and other large spaces
- High absenteeism
- General feeling of “stiffness” among building occupants

### Indoor Air Pollution: Its Causes

**E**vidence accumulates daily that indoor air pollution, caused and exacerbated by inadequate ventilation, is the major cause of tight building syndrome. An indoor environment that lacks proper ventilation and air filtration allows for the growth and spread of germs and microbes that can infect building occupants. Dirt, dust, fibers and potentially hazardous gases also may accumulate in the indoor atmosphere, to be distributed throughout the building by an improperly maintained HVAC system.

#### Dirty Duct Work

Because many HVAC systems are poorly maintained, excessive dirt accumulation in duct work is common. Dirt is often

trapped in the system during building construction. More dirt is added to these accumulations as it enters into the ventilation system with the natural air flow. Good, clean filters can reduce, but not halt, the rate of entry.

High levels of microbe, fungus and germ contamination also have been discovered in ventilation systems. *Legionella Pneumophila*, the cause of the deadly Legionnaire's disease, frequently has been detected inside air-conditioning systems.

In some cases, more than 28 different species of fungus have been found to be contaminating air handling systems. Many of these can  
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**Indoor Air Pollution**

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cause severe allergic reactions among building occupants. In most instances, both reactions and complaints have stopped soon after the system was cleaned and the sources of the contaminants removed.

**Chemicals & Gases**

Organic chemicals compose another group of pollutants with radon gas being the most well known of the group. Radon exists in water and air pockets within soil and enters structures through running tap water, closed crawl spaces or cracks in the building's foundation. Radon is more often found in residential homes than in buildings, mainly due to the lower air exchange rates in homes.

Other gases that contaminate indoor air in commercial buildings include ozone generated by copying machines, carbon dioxide produced by respiration, carbon monoxide carried into buildings from vehicle exhaust fumes, methyl alcohol from duplicators and formaldehyde from carpet adhesive. Each of these gases can cause health problems ranging from minor irritations to severe discomfort and illness when encountered in high concentrations.

**Fibers**

Fibers may cause the most noticeable irritation of any group of indoor air pollutants.

Asbestos fibers, for example, have long been known to be a health hazard. Prior to 1973, asbestos was used for insulation in both commercial and residential buildings and in countless household appliances. The EPA has estimated that approximately 733,000 of all government, residential and private non-residential buildings in the United States have some type of asbestos-containing material.

Many asbestos-containing materials or products bear no health risk when kept intact; however, wear, abrasion or water damage can release the asbestos fibers into the air, creating a serious health hazard. Glass fibers, contained in fiberglass, also are often used as insulation. Although fiberglass is not shed in as large quantities as asbestos, fragmentation does occur and can cause severe

irritation as can fibers shed from clothing, furnishings and carpets.

**NEMI Training**

Dirt, fungus, chemicals, gases and fibers that have accumulated within a poorly ventilated building can pose serious health threats to building occupants. Ordinary cleaning processes usually will remove the larger particles, but the cleaning may increase the concentration of the smaller particles in the air. The best method for clearing the air and ensuring that it remains clean is to have retrofit work and proper maintenance performed on the HVAC system—skills that union sheet metal workers can learn through NEMI's IAQ training program. Skills that can provide increased business and profits for NEMI members.

**Common Indoor Air Pollutants**

- Fungi, spores and bacteria, such as the deadly Legionnaire's disease, which can grow in heating vents and air-conditioning systems.
- Ozone, emitted from photocopiers.
- Methyl alcohol from duplicators.
- Asbestos, which is often found in old buildings.
- Smoke from cigarettes or grills.
- Formaldehyde, which is found in newer buildings and in new furniture.
- Fiberglass particles.
- Carbon monoxide drawn in from underground garages or the street.
- Shampoo build-up in carpets.

## Ventilation and Indoor Air Pollution

Individually, most common indoor air contaminants do not pose a great health threat to building occupants. But in an inadequately ventilated building, they can be mixed together, creating a virtual soup of hazardous pollutants.

This mix, however, can be eliminated through relatively simple HVAC adjustments. Increased ventilation will "air out" the building by carrying the noxious gases out of the interior atmosphere and into the ventilation

and filtration system. Proper HVAC maintenance such as cleaning duct work, replacing worn filters and adjusting fan speeds will prevent the further buildup of these and other contaminants.

As NEMI-trained IAQ specialists, union contractors and technicians will be able to quickly identify indoor air pollution problems, perform the work necessary to clear the air of pollutants and prevent further accumulation. They will be able to adjust HVAC systems to

provide the ventilation that will relieve most chemical and gas related problems. They will also be able to offer periodic check-ups that will help prevent the buildup of dirt, germs, microbes and fibers.

By adding these IAQ services to a proven array of

energy management services, NEMI contractors and technicians will be able to offer a unique combination of building services; a combination that will result in increased and continuing business opportunities.

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## **INDUSTRY CURRENTS**

### **Symptoms of Indoor Air Pollution**

The symptoms of tight building syndrome mimic those of many other disorders, from flu and colds to more serious lung diseases. Tight building syndrome symptoms, however, tend to disappear after the sufferer leaves the building.

Some of the most common symptoms of tight building syndrome include:

- Headaches
- Sinus problems
- Upper respiratory distress
- Eye irritation
- Runny nose
- Cough
- Dizziness
- Shortness of breath
- Nausea
- Tightness in chest
- Fever
- Muscular aches and pains
- Difficulty wearing contact lenses

## Dangers of Inadequate Ventilation & Indoor Air Pollution

**T**hree well-known examples dramatically illustrate the problems inadequate ventilation systems can cause and the dangers of the resulting indoor air pollution:

### 1. Pontiac Fever

In July 1968, an explosive epidemic of illness characterized by fever, headaches and muscular pains, struck 95 of the 100 employees at a health department building in Pontiac, Michigan. A defective air-conditioning system was traced as the source of the illness, labeled "Pontiac Fever."

### 2. Legionnaire's Disease

In 1976, a disease resembling pneumonia hit 182 people attending an American Legion convention in a hotel in Philadelphia; 29 of those affected died.

"Legionnaire's Disease" was traced to bacterial contamination of the hotel's air-conditioning system. The Centers for Disease Control in Atlanta has estimated that the same bacterium, *Legionella Pneumophila*, strikes between 25,000 and 45,000 people each year in the United States alone.

### 3. Complaints At The EPA

In May of 1988, an employee at the Environmental Protection Agency entered her office and immediately felt her lips, ears, throat and eyes burn and began to have difficulty breathing. She left work and returned some five weeks later when the symptoms had disappeared, only to suffer four more attacks within three weeks.

Following similar complaints by approximately 65

other employees, officials at the EPA called in an industrial hygienist to explore the problem.

The hygienist found the building to be insufficiently ventilated to siphon off the dangerous mix of chemicals released by newly installed

furnishings. Further investigation found that EPA employees have steadily complained of smelling carbon monoxide and strange fumes while inside the building, noting that windows in the building do not open or are locked.

## Investigating Tight Building Syndrome

*To help determine whether an illness is building related, the following questions should be asked:*

- Do the symptoms go away when the sufferer leaves the building?
- Do the symptoms worsen as the week progresses, improve over the weekend and then worsen again Monday?
- Do any other occupants of the building suffer from similar complaints?
- Is the building new?
- Have there been any water problems in the building that might have left carpeting or ceiling tile damp?

### In This Issue

- A summary of NEMI's new IAQ program
- A description of the leading contributors to indoor air pollution
- An explanation of the link between ventilation and indoor air pollution
- "Industry Currents:" common symptoms of tight building syndrome

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