



"Clean Air & A Productive Workforce: The Case for Improved Indoor Air Quality"

Illinois Department of Labor's On-Site experiences a surge in requests for indoor air testing during the winter months. These requests are driven by manufacturers and warehouses shutting overhead doors and limiting fresh-air intake to maintain a comfortable environment for workers and reduce heating costs. However, the lack of fresh air can lead to a buildup of contaminants that would normally be carried away through open doors or windows. Similarly, office buildings often limit the intake of outside air to save on heating costs. Achieving lower operating costs by restricting air intake is often a false economy. Insufficient ventilation can lead to increased occupant complaints, decreased productivity, and increased absenteeism. Moreover, depending on the contaminants and the work involved, applicable OSHA standards may have minimum ventilation requirements.

Sick Building Syndrome is a term used by the EPA to describe situations in which office workers experience ongoing health issues. These symptoms can easily be mistaken for allergies or seasonal illnesses. The key indicator of a "sick building" is that workers feel ill while indoors, and the symptoms usually disappear after work or over the weekend. The best engineering controls to eliminate these symptoms include fresh air intake, filter cleaning and improvement, and a return-air design that avoids creating pockets of stagnant air.

The most dangerous common indoor air hazard is Carbon Monoxide (CO), which results from the incomplete combustion of fuels used for heating or in internal combustion engines. During warmer weather, fossil-fuel-powered handling equipment operated indoors usually doesn't pose a CO hazard, but shutting overhead doors and limiting fresh air intake can expose employees to CO. CO displaces oxygen in the blood, risking permanent damage to the brain and heart, which are the body's most oxygen-dependent organs.

Symptoms of mild to moderate CO poisoning may resemble the winter flu. As CO levels or exposure time increase, symptoms include irritability, chest pain, fatigue, decreased judgment, dizziness, and blurred vision. Higher levels can cause fainting, severe confusion, and collapse. If exposure continues, it can lead to coma, convulsions, and death from respiratory arrest.

Most metal fabrication processes produce fumes containing toxic metals, depending on the process or filler rods used. Some particularly hazardous welding methods generate nitrogen dioxide, carbon monoxide, and ozone. For this reason, OSHA has a minimum mechanical ventilation standard for welding or cutting on most materials, along with the requirement to perform a baseline survey to identify contaminants in welding fumes. Welding suppliers must provide SDSs for the filler rods, but interactions among different metal alloys, shielding gases, and temperatures can cause chemical reactions that vary, making only a direct-reading instrument and personal sampling capable of reliably identifying and measuring the components in welding fumes.



Local exhaust ventilation systems are the preferred engineering control for removing fumes; however, makeup air must be supplied to prevent air starvation. Air starvation creates a vacuum in the shop, pulling in whatever air it can to raise the pressure inside the room, potentially drawing exhaust gases from furnaces, water heaters, and the sewer, which can introduce CO and methane. The lack of makeup air limits the effectiveness of local exhaust ventilation.

The economic benefits of having a workforce that shows up daily instead of repeatedly calling in sick with flu-like symptoms, becoming dizzy at work while driving a forklift, or chronically missing work due to a sore throat from toxic welding fumes, outweigh the increased cost of conditioning outside air. Add the potential penalties for OSHA violations and the higher workers' compensation insurance premiums that come with increased injuries and illnesses, and the economic case is clear: fresh air intake saves money, boosts productivity, and safeguards employees' health.

The Illinois On-Site Safety and Health Consultation Program has calibrated direct-reading devices, air sampling equipment and trained professionals ready to identify and quantify potential contaminants, fulfilling OSHA's HAZCOM and PPE assessment requirements. This program, offered at no cost by the State of Illinois, can provide the support and guidance needed to identify hazards, develop a hierarchy of controls, and establish a lasting safety and health program. Consulting services include on-site visits, air sampling, program assistance, and training, all of which can help create a safer, healthier workplace and possibly reduce workers' compensation insurance costs. Visit

<https://worksafe.illinois.gov/> or contact Harry (Hap) Hileman with the Illinois Department of Labor at 217-993-2111 for more information.



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