

# INDOOR AIR CONTAMINANTS

## SOURCES & ADVERSE EFFECTS

Indoor air contaminants consist of an array of internally generated toxins, chemicals, vapors, gases, particles and odors that buildup and cause deficient IAQ, especially as structures become increasingly air-sealed. The contaminants come from many sources and have a myriad of adverse effects on indoor occupants. Below is a chart describing common indoor air contaminants, their sources and their adverse effects:

Indoor Air Contaminants	Sources	Adverse Effects
Humidity	Exhaled breath, water sources (faucets, showers, leaks)	Aggravated allergies and asthma
Carbon Dioxide	Exhaled breath	Headaches, fatigue, drowsiness, eye and throat irritations; impairs cognitive function and decision-making at levels normally found indoors
Formaldehyde	Off-gassed from adhesives, fabric treatments, stains, varnishes	Irritations to respiratory system, eyes, nose and throat; known carcinogen
Other Volatile Organic Compounds (VOCs), toxic gases, vapors	Off-gassed from furniture, carpets, paints, cleaners, solvents, glues, other building materials	Headaches, fatigue; irritations to eyes, nose, throat and skin
PM2.5: Ultra-fine, airborne, inhalable particulate matter 2.5 microns in diameter or less	Skin, clothing fibers, condensation of VOCs	Impairment to heart and lungs, especially among children
Odors	Bathrooms, kitchens, pets, occupants (perfume, soap/shampoo residue, detergent used to wash clothing, general odors)	Headaches, dizziness, nausea
Bioeffluents	Human metabolic process	Headaches, fatigue, drowsiness, eye/throat irritations
Molds, microbial contaminants, fungi, bacteria	Stagnant water, drains, condensate pans, damp areas	Aggravated allergies and asthma
Radon	Uranium decaying in the soil	Cell damage, potentially lung cancer
Dust mites	Carpets, fabric, foam cushions	Aggravated allergies and asthma
Phthalates	Off-gassed from adhesives, vinyl flooring, wood finishes, plastic plumbing pipes, other building materials	Obesity, reproductive problems, potentially cancer
Carbon Monoxide	Exhausted from gas heating systems, gas stoves, gas hot-water heaters, cigarette smoke, cars	Headaches, fatigue, dizziness
Tobacco smoke	People smoking inside or near a home or building (first-hand, second-hand, third-hand)	Headaches, dizziness; known carcinogen
Wood-fire smoke	Fireplaces, unvented appliances	Respiratory irritations
Ozone	Off-gassed from office equipment, electric motors, electrostatic air cleaners	Chest pain, asthma, respiratory irritations

The most energy-efficient, cost-effective and sustainable way to remove indoor air contaminants and enhance IAQ is through increased and balanced ventilation provided by RenewAire ERVs. For more information, visit: [renewaire.com](http://renewaire.com).

Sources: U.S. Environmental Protection Agency (EPA) and Canadian Centre for Occupational Health and Safety (CCOHS)