

Smoking in the Workplace: Ventilation

An interview with
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Q: Where does one begin in efforts to maintain clean indoor air?

A: The best and most effective way to maintain indoor air quality is by controlling the source of the pollutant. In the case of environmental tobacco smoke, this means restricting smoking to separately ventilated spaces, or banning smoking indoors, a less costly alternative.

Q: How would you rate smoking as a pollutant source in indoor environments?

A: It is a major source of indoor air pollution. Smoking produces about 4,000 chemicals in the particle phase and about 500 chemicals in the gas phase. The tar particles contain most of the cancerous substances in tobacco smoke. The gases contain most of the irritating substances.

In particular, cigarettes, pipes, and cigars produce tremendous clouds of respirable tar particles when they are smoked. These tar particle clouds easily predominate over background levels of particulate air pollution in buildings. When these particles are inhaled and deposited in the nonsmoker's lungs, they may remain for months.

Q: Don't the ventilation standards proposed by ASHRAE (the American Society of Heating, Refrigerating, and Air Conditioning Engineers) control tobacco smoke in buildings?

A: No. The ASHRAE ventilation standards are not health-based standards designed to limit cancer risk or eye irritation to acceptable levels. They are designed only to limit dissatisfaction with tobacco smoke *odor* to a maximum of 20 percent for visitors (mixed smokers and nonsmokers) to a building where smoking occurs. Currently ASHRAE recommends 20 cubic feet of outdoor ventilation air per occupant (CFM/occ) for this purpose.

Q: Will an increase in building ventilation eliminate indoor air quality problems due to smoking?

A: No. Providing a level of ventilation that would produce only 20 percent dissatisfaction in a group of *nonsmokers* requires in excess of 100 CFM/occ—substantially beyond the maximum capacity (60 CFM/occ) of typical mechanical ventilation systems at typical design occupancy. Further, ventilating a building to reduce cancer risk to a level that would meet one proposed standard would create a virtual windstorm indoors, requiring 5,400 CFM/occ.

Q: If a special smoking area is established in a building, what ventilation issues are raised?

A: Establishing a physically distinct smoking area within a building is a workable, although often expensive, source control option *provided* it is ventilated independently from the rest of the building. This area should be under negative pressure relative to the nonsmoking areas of the building and should be ventilated at the maximum capacity of the ventilation system. Special smoking areas in existing buildings may require structural or mechanical system modification. In new buildings they may be designed and installed at less cost.

Q: When one is unable to eliminate the source or separately ventilate the workspace, how successful are other approaches to handling cigarette smoke? Will the use of an air cleaning device or desktop smokeless ashtrays effectively reduce the problem?

A: No. First, to be at all effective in reducing the concentration of smoke in a space, any air cleaner must process many room air volumes per hour. This requirement rules out desktop devices. Second, even large, expensive air cleaners with high efficiencies for



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No. 5 in
a series

2023668674