



Shaping Tomorrow's
Built Environment Today

ENVIRONMENTAL TOBACCO SMOKE AND ELECTRONIC NICOTINE DELIVERY SYSTEMS

THE ISSUE

While indoor smoking has become less common in recent years in many countries the use of Electronic Nicotine Delivery Systems (ENDS) has significantly increased. Both smoking and the use of ENDS negatively affects indoor air quality and each has inherent health risks.

Exposure to Environmental Tobacco Smoke (ETS) continues to have considerable health and cost impacts. Researchers have investigated the health and irritant effects among non-smokers exposed to tobacco smoke in indoor environments. Such exposure is also known as passive smoking and as involuntary exposure to secondhand smoke. A number of national and global health research groups and agencies have concluded, based on the preponderance of evidence, that exposure of non-smokers to tobacco smoke causes specific diseases and other adverse effects to human health, most significantly cardiovascular disease and lung cancer. No cognizant authorities have identified an acceptable level of ETS exposure to non-smokers, or expectation that further research will identify such a level.

Simultaneously with the decline of tobacco smoking, the use of Electronic Nicotine Delivery Systems (ENDS) including vape pens, electronic cigarettes, and other device that convert nicotine into an inhalable aerosol without combustion has rapidly increased. The vapor or aerosol emitted from these devices contains varying amounts of nicotine dissolved in propylene glycol, or glycerol along with volatile compounds (VOCs).^{1,2} Unique to the use of ENDS is the concentration and type of compounds that may deposit and remain on indoor surfaces. These deposits represent a unique source of contamination in buildings that varies depending on indoor climate, airflow and surface area that may require specialized cleaning, HVAC maintenance, and other operational practices.³ In addition, limited studies have been performed to evaluate the chemical reactions and health interactions that may occur between ENDS emissions and other airborne contaminants commonly found indoors.

Despite the well-documented benefits of smoking bans, many locations worldwide still lack laws and policies that provide sufficient protection. Still fewer bans include the use of ENDS. In many locations, laws and policies are only partially protective, permitting smoking and ENDS usage in certain areas of buildings or specific building types including casino, entertainment and multifamily housing.

¹ Offermann 2015. F.J. Offermann, "Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures," *Building and Environment*, Vol. 93, Part 1, 101-105, November, 2015.

² Cooke 2015. Cooke, Andrew, MDa, et. al., "The Electronic Cigarette: The Good, the Bad, and the Ugly," *J Allergy Clin Immunol Practice*, 2015, Vol. 3, 498-505.

³ Schripp 2013. Schripp, et. al., "Does e-cigarette consumption cause passive vaping?" *Indoor Air* 2013; 23: 25–31.

ASHRAE's ROLE

Providing healthy and comfortable indoor environments through the management of indoor air quality is a fundamental goal of building and HVAC design and operation. ASHRAE has long been active in providing engineering technology, standards and design guidance in support of this goal. For example, ANSI/ASHRAE Standards 62.1 and 62.2 are standards that specify minimum ventilation rates and other measures to manage indoor air quality. Therefore, the health effects of indoor exposure to emissions from tobacco products, and ENDS devices are relevant to ASHRAE.

ASHRAE's VIEW

Exposure to ETS can be reduced through a variety of strategies, but they do not completely eliminate exposure to ETS. Only indoor smoking bans, leading to near zero exposure, provides effective control, have been recognized as effective by health authorities. Effects of secondary involuntary exposure to ENDS have not been thoroughly studied by the scientific community, in part because these devices are new, evolving, diverse and customizable. However, because ENDS have become so prevalent, indoor building components and occupants are being exposed to passive vapors. Many cognizant public health authorities argue that caution should prevail in all situations of human exposure when limited data is available about health impacts. Applying this principle to ENDS argues that involuntary exposure should be banned in order to keep exposure to airborne emissions as low as possible.

ASHRAE's mission to act for the benefit of the public encourages lawmakers, policymakers and others who exercise control over buildings, to maximize mitigation of secondary involuntary exposure from smoking and ENDS use inside and near buildings. ASHRAE also recommends:

- That building design practitioners work with their clients to define their intent, where smoking and ENDS use is still permitted, for addressing exposure in their facilities and educate and inform their clients of the limits of engineering controls in regard to both ETS and ENDS.
- That multifamily buildings have complete bans on tobacco smoking and ENDS inside and nearby in order to protect nonsmoking adults and children.
- That further research be conducted by cognizant health authorities on the health effects of involuntary exposure in the indoor environment from smoking cannabis, and using hookahs and ENDS. Pending the outcome of that research, cannabis and hookah smoking should be managed the same as recommended herein for ETS and ENDS.