

Clean Air is *Odor-free*

Removing fragrances to improve indoor air quality in schools and offices



Scented products, including air fresheners, scented flame or flameless wax products, oils, hand sanitizers, and scented cleaning products, often found in schools and office buildings, do not remove odors. Instead, they cover up or mask unpleasant smells. When they are used, several concerns arise:

- Chemical Exposure
- Unwanted Chemical Reactions
- Respiratory health concerns

Chemical Exposure

Air fresheners and deodorizing products contain a number of chemicals which are added to create a desired scent, including formaldehyde, p-dichlorobenzene (also called 1,4-dichlorobenzene), petroleum distillates, phthalates, and terpenes. Short-term use of deodorizing products can result in irritation, particularly for those who are sensitive to chemicals and odors. Frequent use can result in other long-term health effects, depending on the amount and time of exposure and current health status.

Formaldehyde and 1,4-dichlorobenzene are volatile organic compounds that can reduce lung function. While formaldehyde is associated with a strong, pungent odor, 1,4-dichlorobenzene is associated with a moth ball odor. Formaldehyde is classified as a carcinogen (cancer-causing agent).

Petroleum distillates are common fragrance components that are highly flammable and cause eye and respiratory irritation. These products have a kerosene-like odor.

Phthalates are a type of chemical added to make a product flexible or moldable. They can be found in fragrant items, such as candles and cleaning products. Phthalates can disrupt the endocrine (hormone) system, impacting the growth and development of young children.

Terpenes are volatile organic compounds derived from plants such as citrus fruits, pine trees, and herbs (e.g., lavender, rosemary, and mint). These “natural” products are often used in fragrances, reed diffusers, and essential oils. When aerosolized, these oils can cause respiratory irritation.

Other Chemical Concerns

Although ammonia and ammonia-based compounds are often found in household cleaning products, they are also used in air deodorizers. Ammonia is a colorless gas with a pungent odor that is known to be a respiratory irritant.

Hand sanitizers may also contain “antibacterial” components, such as alcohol, that can cause respiratory irritation. In some settings, disinfecting products like these may be important, but in many cases, hand washing with soap and water is sufficient.

Unwanted Chemical Reactions

Some of the compounds used in cleaners and air fresheners can interact with other products to form dangerous byproducts. For example, using a product with chlorine or bleach with or after using a product containing ammonia can result in chlorine gas formation. Chlorine gas is a strong irritant that can damage the lungs.

Ground level ozone is an air pollutant created when certain chemicals released from motor vehicles or power plants interact with one another in the presence of sun. Photocopiers can generate low levels of ozone that is typically diluted or removed through ventilation. Whether from an indoor or outdoor source, ozone can cause secondary

formation of other chemicals, which can be irritants. For example, terpenes exposed to ozone in the indoor environment can result in the formation of formaldehyde.

Respiratory Health

Chemicals in deodorizing and air freshening products can irritate the skin, eyes, nose, and respiratory tract. Individuals with pre-existing conditions such as COPD, asthma or autoimmune conditions may also experience allergic reactions, sensitivities, or inflammation.

Irritating substances are generally more concentrated indoors and can play a significant role in worsening asthma symptoms. To alleviate symptoms, increase ventilation and try to eliminate the sources of irritation, such as air fresheners and deodorizers.

Identifying Chemical Components

To identify products containing respiratory irritants, read the label and ingredient list. Manufacturers typically post safety data sheets (SDS) on their websites, which list the ingredients. Many manufacturers are exempt from listing proprietary ingredients (including fragrances), some of which are strong irritants. If individual chemical information is not available, refer to the product label. A label that states a product should be used "only in a well-ventilated area," typically indicates that the product contains respiratory irritants.

Steps to Improving Indoor Air Quality

Cleaning in schools, office spaces, and other public buildings should be performed by janitorial staff trained to use standardized products. For spot-cleaning, building or office managers can provide staff with cleaners compatible with those used by the janitorial staff. A soap and water mix is usually sufficient.

In spaces such as kitchens or daycares where sanitizing or disinfecting is required, cleaning products should be selected based on effectiveness, the amount of irritating constituents,

and should only be used by trained staff with proper ventilation.

The Commonwealth's Environmentally Preferable Products Procurement Program provides resources for selecting and purchasing general-purpose and specific-use cleaning supplies and equipment. State and local buying agents should select products from the FAC85 contract:

<http://www.mass.gov/anf/docs/osd/uguide/fac85.pdf>.

Scented products do not remove the source of unwanted odors, which may be an indication of a larger issue. To help identify and reduce odors:

- Ensure supply and exhaust ventilation is operating continuously when the building is occupied. Use local exhaust ventilation to remove odors and moisture in "smelly" areas such as bathrooms and kitchens. Ventilation equipment should be maintained and cleaned, and filters changed on a regular basis.
- Check if odors from outside (e.g., a dumpster, idling vehicles) are entering the building through open windows or fresh air ventilation.
- Sewer gas odors indicate dry drain traps, leaks in the plumbing vent system or other conditions that need to be repaired.
- Water leaks can cause mold growth, which may produce an odor. Leaks should be repaired, and water-damaged materials cleaned or removed.
- Seal pathways between occupant areas and odorous areas, such as a crawlspace. Make sure doors and pipe chases are air-tight.
- Monitor the use and storage of food to reduce the potential for spoilage, spills, and crumbs, which may cause odors or lead to pests. Clean refrigerators and cooking equipment regularly.
- Control pests by using Integrated Pest Management (IPM) practices.
- Regularly clean all areas in the building. Remove trash and garbage regularly. Wipe up spills. Ensure absorbent fabrics, such as upholstered furniture and carpets, are cleaned often to remove build-up of dirt and debris.

For more information, contact:

Indoor Air Quality Program
Bureau of Environmental Health
Massachusetts Department of Public Health
250 Washington Street, 7th Floor
Boston, MA 02108
Phone: 617-624-5757 | Fax: 617-624-5183 | TTY: 617-624-5286
www.mass.gov/dph/iaq



November 2016