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Ozone Generators - Warning - Not For Occupied Spaces

Not all indoor air cleaning devices are alike, and certain types could cause health problems. Machines that purposefully produce ozone as an indoor air cleansing agent are currently on the market for residential use - these products should be avoided.

Ozone is a potent lung irritant that can cause respiratory distress, and levels of ozone that clean air effectively are unsafe to human health. The Alaska Division of Public Health is warning Alaskans not to use ozone generating devices in occupied spaces such as vehicles or residential homes. While some of these machines have valuable commercial applications such as the removal of odors from unoccupied buildings, ozone generators should not be used when people, animals or plants are present.

Ozone (also referred to as trivalent oxygen or saturated oxygen) is a powerful oxidizing agent. Long term exposure to high levels of ozone may result in permanent lung damage. Exposure to ozone can also result in cough and chest pain on deep inhalation, eye, throat and nose irritation, and increased sensitivity to airborne allergens and irritants. While ozone is a necessary part of the upper atmosphere, ozone is a principle component of smog in the lower atmosphere that we breathe. Ozone can also react with volatile organic compounds in the air to produce harmful byproducts such as formaldehyde. Ozone is produced indirectly by ion generators and some other electronic air cleaners, and directly by ozone generators.

The elderly, families with children, and people with respiratory diseases such as asthma are the most susceptible to the toxic effects of ozone, and are among those most likely to be interested in using an indoor air cleaner. The American Lung Association recommends that people seeking cleaner indoor air avoid ozone generating devices⁽¹⁾. Consumers should determine whether any electronic air cleaner they are considering for purchase has been tested for ozone production. Filters or electrostatic precipitators may be safer methods with which to clean indoor air, and are more effective alternatives than ozone generating devices.

The U.S. Food and Drug Administration prohibits devices that result in more than 50 parts per billion (ppb) of ozone in the air of occupied enclosed spaces such as homes, offices or vehicles, or that result in any releases of ozone in places occupied by the ill or infirm. Independent testing by Consumers Reports in 1992 revealed that two brands of air cleaners using ionizer/ozone generator technology under a variety of conditions frequently produced ozone levels above the FDA's limit of 50 ppb⁽²⁾. The levels of ozone generated by a device are influenced by many factors such as the power setting, room size and ventilation rate, and are not easily controlled by the individual consumer.

Although personal or residential ozone generating machines are promoted as air cleaners, independent studies have shown that the machines do not effectively destroy microbes, remove odor sources or reduce indoor pollutants sufficiently to provide any health benefits^(2,4). Levels of ozone below the FDA's limit of 50 ppb are not sufficient to function as effective air cleaning devices. Commercial ozone generating devices are useful for some applications such as the clearing of smoke and other odors from contaminated buildings. However, high levels of ozone are used during these commercial applications, and spaces must be unoccupied at the time of treatment.

The Federal Trade Commission (FTC) has recently taken action against some manufacturers of ozone generating machines to prohibit them from making unsupported claims about the ability of the machines to clean air or to provide health-related benefits. In its complaint, the FTC named Living Air Corporation, Alpine Industries, Inc., Quantum Electronics Corp., and the officers of those companies. Also, the State of Minnesota recently prevailed in a lawsuit against Alpine Air Products, Inc. The Minnesota District Court found that the company had violated Minnesota consumer fraud and antitrust laws by making false and misleading claims about the efficacy and safety of ozone-generating Alpine purifiers. Recommendations to avoid the use of ozone generating devices in inhabited spaces due to health-related concerns have been issued by several states, including North Carolina, Minnesota, Florida and California.

The most effective way to avoid indoor air pollution problems is to remove the sources of pollution or prevent emissions from occurring. For many people, the most effective way to reduce indoor air pollution is to stop smoking. People concerned with indoor air pollution in their homes should consult a heating, ventilation and air conditioning professional.

References:

1. American Lung Association, 1997. Residential air cleaning devices: types, effectiveness, and health impact. 52 p.
2. Consumer Reports, 1992 (October). Household air cleaners. p. 657-662.
3. Boeniger MF, 1995. Use of ozone generating devices to improve indoor air quality. *Am Ind Hyg Assoc J* 56:590-598.
4. U.S. Environmental Protection Agency, 1995. Ozone generators in indoor air settings. U.S. EPA Report, EPA-600/R-95-154 (NTIS PB96-100201).

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