

Ozone Part II: Indoor Sources of Ozone

The importance of ozone in the upper atmosphere and the generation of ozone pollution in the lower atmosphere through photochemical reactions was established in the last ozone post. This post will focus on indoor sources of ozone.

Research has shown that in the absence of indoor sources of ozone, indoor levels of ozone will be 20-70% lower than outdoor levels and will mirror the outdoor daily and seasonal ozone fluctuations (i.e., caused by sunshine, temperature, and other factors) [1]. The wide percentage listed is due mainly to differences in the amount of fresh air return in ventilation systems.

The indoor ozone concentrations will increase in any facility where electric motors, power generators, or transformers exist. For instance, in scientific laboratories, general rotary pumps, vacuum pumps, fume hoods, and other power generating equipment are prevalent, resulting in an increase in ozone concentrations. Ozone attacks chemical compounds with double bonds, which includes rubber, plastics, textiles, vinyl, and many other materials and can cause rapid deterioration of these materials.

Ozone levels in office areas can increase due to the use of equipment like copiers, laser printers, and projection lamps. Other VOCs also may be produced by these office machines so sufficient ventilation should be available to protect workers' health. Ozone is also produced from industrial activities where UV radiation is emitted, such as with arc welding.

Ozonation, which is a process whereby ozone is purposely introduced into an area to help remediate odors and other indoor air quality issues, will be the subject of the next ozone topic in this series.

[1] Weschler, CJ, (2000). "Ozone in Indoor Environments: Concentration and Chemistry". Indoor Air, Volume 10, Number 4: 269-288.