

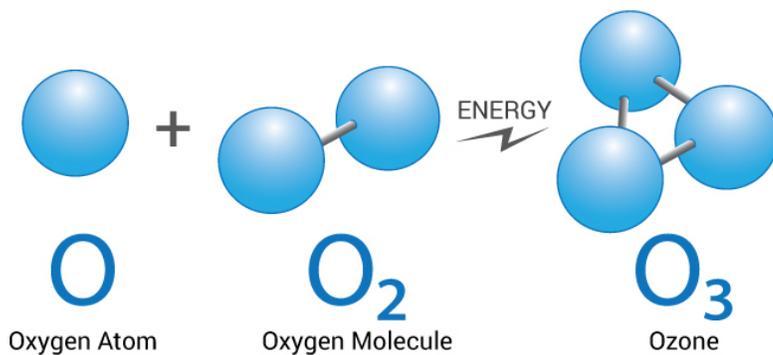
Why Ozone for Disinfection?

If the COVID-19 pandemic taught us anything, it was that germs on hard surfaces can be spread to others. EarthWalk is in final development stages of a new way to sterilize classroom devices quickly and efficiently, adapting products we already produce and using ozone as an effective way to decontaminate technology devices.

Some FAQs on Ozone

Ozone is a naturally occurring compound. It's produced in the upper atmosphere (the ozone layer), and thunder storms also produce ozone via lightning strikes (i.e. the electrical excitation of oxygen molecules heating the air and splitting the bonds between the atoms).

Essentially, oxygen is the bond of two oxygen atoms (O_2); electrical energy breaks the oxygen molecular bond, forming single atoms that collide together and result in the formulation of ozone (O_3).



O_3 is classified as an oxidizing and disinfecting agent and is an extremely effective germicide against viruses and bacteria. Oxidation occurs when ozone molecules encounter oxidizable substances, including microorganisms (viruses, molds, and bacteria). The unstable third single oxygen atom bonds to the material it contacts, destroying the virus particles. Virus particles, unlike many other microorganisms, are not able to repair oxidative damage, and are therefore more susceptible to oxidative antimicrobial action. Thus, O_3 is used globally to sanitize and disinfect drinking water, in food manufacturing and processing, in healthcare facilities and labs as well as in other industries.

SARS-CoV-2 (responsible for COVID-19) is an enveloped virus, which means the structure of these viruses include a lipid envelope and are easily susceptible to destruction by disinfectants—including O_3 . Ozone readily oxidizes the lipid envelope, changing its structure or destroying it. Other virus families are also destroyed by direct damage via ozone to capsid proteins and nucleic acids.

Ozone, unlike UV technology (typically UVC), is a heavy gas that can penetrate every corner of the EarthWalk carts & stations—disinfecting all of the devices effectively. UV sterilization is really only effective when the light is able to directly reach surfaces.

The unstable O₃ molecules (also known as tri-atomic oxygen) have a short lifespan. The gas decomposes and forms oxygen, leaving no harmful residue or odor after disinfection. Its use inside a contained space (such as EarthWalk carts and stations) is ideal and effective.

Ozone generators produce O₃ with extreme high voltages. When the ozone generator is deployed inside the Earthwalk cart/station, make sure the sealed door is kept closed until the entire disinfection cycle is completed. As with other sterilization methods, strict standards are to be followed for safety reasons.

Effective

Ozone kills viruses and bacteria more effectively—and 3,000 times faster—as compared to chlorine, and with no poisonous residue.

Powerful

Ozone is a powerful weapon to combat germs and viruses, other flu's and even the common cold, utilizing full coverage in an environment more efficiently and safely than with UV technology.

Efficient

Decontamination is quick: the ozone generator is activated and the total process lasts approximately 30 minutes, resulting in clean oxygen once the full cycle is complete.

RESOURCES:

Dennis R., Cashion A., Emanuel S., Hubbard D. 2020, "Ozone Gas: Scientific Justification and Practical Guidelines for Improvised Disinfection Using Consumer-Grade Ozone Generators and Plastic Storage Boxes." *Journal of Science and Medicine*, V2I1.35.

Sandle T., "Gaseous Sterilisation." ScienceDirect (abstract from *Sterility, Sterilisation and Sterility Assurance for Pharmaceuticals*, 2013, chapter 8.4.) www.sciencedirect.com/topics/medicine-and-dentistry/ozone. Accessed May 2020.

"Ozone—A Natural Powerful and Green Disinfecting Agent." Global Water Intelligence, www.globalwaterintel.com/sponsored-content/ozone-a-naturally-powerful-and-green-disinfecting-agent-evoqua. Accessed May 2020.