



What is Ozone?

SUPER OXYGEN FOR HEALING

When you hear the word “ozone,” you may immediately think of the ozone layer in our atmosphere that protects us from the ultraviolet radiation from the sun. The sun’s ultraviolet rays are what create ozone (O₃).

Ozone (O₃), is an energized form of oxygen which contains three atoms of oxygen rather than the two we normally breathe. Ozone is the second most powerful sterilizer in the world and can be used to destroy bacteria, viruses, and odors. Interestingly, ozone occurs quite readily in nature, most often as a result of lightning strikes that occur during thunderstorms. In fact, the “fresh, clean, spring rain” smell that we notice after a storm most often results from the creation of ozone.

How does ozone work?

The third oxygen atom of ozone makes it extremely reactive, readily attaches itself to other molecules. When contaminants such as bacteria or viruses make contact with ozone, it creates a minuscule hole in the cell wall. After the ozone breaches the cell wall, the bacteria will be unable to survive. This process is called “oxidation.” Once used, ozone reverts to oxygen, making it a very environmentally friendly oxidant.

Isn’t ozone a pollutant?

Unlike stratospheric ozone, which forms naturally in the upper atmosphere and protects us from the sun’s harmful ultraviolet rays, ground-level (or tropospheric) ozone is created through the interactions of both human-made and natural emissions of volatile organic compounds (VOCs) and nitrogen oxide (NOx) in the presence of heat and sunlight. Cars and gasoline-burning engines are significant sources of VOCs, which also come from consumer products such as paints, insecticides, and cleaners, as well as industrial solvents and chemical manufacturing. NOx, the other chemical precursor of ozone, is produced whenever we burn fossil fuels, primarily by motor vehicles and power plants. The sun’s direct ultraviolet rays convert these emissions into ground-level ozone, which is unhealthy to breathe.

Is ozone safe?

Ozone is safe when used under the right circumstances. However, if the proper safety measures are not in place, then high concentrations of ozone in the air can cause health problems. The U.S. Occupational Safety and Health Administration (OSHA), has stipulated that the allowable safe level of residual ozone is 0.1 ppm. Note that this permissible exposure limit (PEL) is for continuous exposure throughout an entire eight-hour day.

If you start to cough when around ozone, there is too much ozone in the air, and you should remove yourself from the location or properly ventilate while remedying the cause of ozone in the air. Do keep in mind that it takes an extended period at very elevated levels to cause irritation to the lungs.

How is medical ozone produced?

There are two methods of producing ozone: ultraviolet (UV) and corona discharge. Corona discharge creates

ozone by applying high-voltage to a metallic grid sandwiched between two dielectrics. The voltage passes through the dielectric to a grounded screen/plate and in the process, creates ozone from oxygen present in the chamber. UV light creates ozone when a wavelength of 254 nanometers (nm) hits an oxygen atom. Both processes split oxygen molecules into single oxygen atoms (O). These atoms combine with another oxygen molecule (O_2) to form ozone (O_3), which physicians then use medically.

THE FORMATION OF OZONE

