Biozone Scientific
Air Purification Technology

For air purification, Biozone has developed a technology we call **PureWave** that combines the science of ultraviolet germicidal light waves, purifying hydroxyls, activated oxygen, and photo-ionization. What makes this technology important and unique is that it unites four of the most accepted and powerful methods for destroying contaminants, with the resulting synergy producing a stronger process than the sum of the individual methods.

The result of this perfect marriage of science and electronics is the "ultimate" air purifying process.

Ultraviolet Light (UVGI)

Biozone's technology revolves around the power and versatility of UV light waves. A basic characteristic of UV lamps is that the larger the lamp, the greater the output of germicidal ultraviolet germicidal irradiation (UVGI). But larger or longer UV lamps that create ozone can also produce too much ozone. Working with the world's premier manufacturer of UV lamps, Biozone has developed a high-purity, split lamp that produces significantly more UVGI but without increased ozone production. Also important is the ability our units have to maintain consistent UV wavelengths. Our lamps can produce UV light at the 185 nanometer (nm) and 254nm wavelengths. This combination of wavelengths is necessary for the photo-oxidation of organic compounds.

The specific wavelength of 254nm is most effective at inactivation of harmful contaminates. As an airborne microorganism enters the Biozone Air Purification Chamber, the UV light penetrates the organism’s membrane and alters its genetic material (DNA). With altered DNA, the microorganism will no longer be able to reproduce—rendering it microbiologically dead and, therefore, harmless. Due to the short lifespan of most microorganisms, once they lose the ability to reproduce, the population of them in the air diminishes rapidly and dramatically.

Photolic Ozone - Guaranteed Control

While most manufacturers of ozone air purifiers use the older, corona discharge (high voltage electricity) method to create ozone, our unique UV lamp technology also naturally controls ozone levels by producing wavelengths that produce photolic ozone and other wavelengths that control its level by naturally destroying excess ozone. Like ozone, UVGI destroys bacteria, viruses, and fungi, and has been used in medical facilities for years for those exact purposes for nearly three-quarters of a century.

Hydroxyl Radicals (OH)

The combination of photolic ozone, UVGI, and moisture (humidity) produces powerful oxidants known as hydroxyl radicals. These molecules have been described as "the single most important cleansing agent in the earth's atmosphere." They break down hazardous organic compounds and are a major catalyst in the chain reaction necessary for contaminant oxidation.

Why Are Hydroxyls An Important Part of Our Air?

Hydroxyls are the atmosphere's natural filter. Several recent studies have brought to light some alarming facts:

According to a New York Times article (May, 2001), hydroxyl radicals are thought by atmospheric chemistry scientists to purge more than half the sulfur dioxide added to the air by smokestacks, volcanoes, and other sources.

An international study being conducted over the Indian Ocean, which in part, measured hydroxyl radical levels, led a team of atmospheric experts to conclude that without hydroxyl radicals, air pollution can remain at toxic and harmful levels for much longer, increasing the likelihood of negative effect on humans. More than half a million people die in India every year of pollution-related respiratory ailments; similar numbers are recorded in other Asian countries. It is a known fact that hydroxyl radicals are necessary for natural air cleansing and toxin removal. Hydroxyls are why our planet hasn't choked itself to death and the reason we can live at all in our cities.

Negative Ions

In addition to these highly effective purification methods, Biozone units produce negative ions by means of a patent-pending method that dramatically accelerates the production of negative ions via ultraviolet wavelengths.

Researchers believe that through control of the electrical charges in the air we breathe, our moods, energy level, and health can be markedly improved!

Today, our modern homes and offices seal out negative ions. Computer terminals, fluorescent lighting, forced air ventilation systems, and modern building materials generate an over abundance of positive ions. Positive ions make us feel tired, depressed and irritable.

Balancing the ionization in your home may help to combat the ill feelings associated with our stressful lifestyles. The worlds most tranquil and refreshing regions are loaded with billions of negative ions. Air near waterfalls, mountains, beaches and forests are among those places where ionization levels are in complete and natural balance.

After a lightning storm, most of us feel invigorated and refreshed. This is because the electrical storm has generated trillions of gloriously tranquilizing negative ions that ease tension and leave us full of energy.

Scientific studies have shown that atmospheres charged with negative ions relieve hay-fever and asthma symptoms, seasonal depression, fatigue and headaches. It's also been shown that negatively ionized atmospheres improve performance of voluntary movement, increase work capacity, sharpen mental functioning, and reduce error rates.

Studies at Columbia University and the New York State Psychiatric Institute have demonstrated that High Density Negative Ionizers appear to act as a specific antidepressant for patients with seasonal affective disorder (SAD).

Remarkable as it may seem, a room charged with negative ions was shown to stem bacteria growth and precipitate many airborne contaminants including pollen, dust and dust mites, viruses, second-hand cigarette smoke, animal dander, odors and toxic chemical fumes.

Photolic Ozone

Ozone generators have been used for over a hundred years for purification and sanitation purposes in a wide variety of applications. Ozone's properties as a bactericide, viricide, fungicide, and deodorizer are well accepted by the scientific community. Industry as well as the general public has eagerly accepted ozonation as a method of water and air purification. However, it is also well established that exposure to high levels of ozone can be harmful to health, and in particular can be a respiratory irritant. This has lead to a controversy as to the safety of such ozone generators for general public use. There is no consensus as to when ozone levels become harmful to humans, but based on available research, regulatory agencies such as the FDA have set safe levels at .05 ppm (parts per million) for continual exposure. OSHA has set 0.1 ppm as a maximum for 8-hour exposures. Other agencies and organizations have similar recommendations. Previously, all ozone generators used for air purification had the potential to produce ozone levels well over these recommended levels. To combat this problem, some manufacturers of portable ozone air purifiers have introduced models with ozone sensors that automatically shut off the units when ozone levels rise above a prescribed limit. While this is a step in the right direction, these devices are not fool proof, nor do they seem to work well in all size environments. They also do little or nothing to control the "blasting" of high concentrations of ozone that occur (usually due to power fluctuations, but there are other causes) when operating.

Biozone's Research and Development has also produced a state-of-the-art electronics module to power the PureWave System. This advanced engineered electronics package is a solid-state unit with constant wattage circuitry for greater electrical efficiency and for the support of consistent output and long life. In addition, the electronics design is 12VDC resulting in one of the safest devices in the market and hence our trademark, SafeVolt. The SafeVolt 12VDC system is a vast electrical improvement over ozone units using the corona discharge method of creating ozone, which requires 5,000 - 10,000 volts of electricity. The added advantage of Biozone's 12VDC system is that it is easily used all over the world. No more worry about countries varying electrical systems using 110VAC or 220VAC or 240VAC. A simple AC/DC adapter is all that is needed.