

# AIR SCRUBBER ADVANCED

BY AERUS

WITH CERTIFIED SPACE TECHNOLOGY™

## ACTIVEPURE® TECHNOLOGY

Safe, Effective, Proven, Certified

ActivePure® is an exclusive environmental technology that can solve many everyday indoor air and surface contamination problems. Traditional passive technologies, such as HEPA, use filtration or electrostatic systems, which remove contaminants only if and when they travel through the purification unit. These traditional filtration systems can help reduce air pollution to a degree, but they do not reduce surface contamination at all and do not adequately reduce airborne contaminants. Our proprietary ActivePure® Technology actively targets contaminants in the air and on surfaces, eliminating them on contact.

ActivePure® Technology is derived from NASA Technology as used on the International Space Station. It is the only Certified Space Technology in the world in its class. ActivePure® Technology utilizes a proprietary hydrophilic photo catalytic coating, consisting of non-nano titanium dioxide with a proprietary combination of additional transition elements to enhance efficiency. Activated by a specific wavelength of ultraviolet light, oxygen and humidity are extracted from the air to create a host of powerful oxidizers that target air and surface pollution. These oxidizers are extremely effective at destroying bacteria, volatile organic compounds (VOCs) and other environmental contaminants. ActivePure Technology does not create harmful chemicals but instead uses oxidizers found naturally occurring in the environment. These oxidizers are not harmful to humans, pets or plants and are complete safe for indoor use.

The key oxidizers created by ActivePure® Technology are the following:

- Hydrogen Peroxide ( $H_2O_2$ )
- Hydroxyls ( $OH^-$ )
- Hydroxyl Radicals ( $^{\circ}OH$ )
- Super Oxides ( $O_2^-$ )

### Hydrogen Peroxide

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A major oxidizer created by ActivePure® Technology is hydrogen peroxide ( $H_2O_2$ ), which has proven to be effective against indoor pollutants and contaminants on surfaces and in the air. ActivePure® Technology produces hydrogen peroxide molecules from the oxygen and humidity already present in the air. The hydrogen peroxide molecules are then carried throughout the indoor environment, neutralizing pollutants and contaminants in places that other technologies and filtration systems can't reach. Because hydrogen peroxide molecules have both positive and negative charges, they are drawn to pollutants and contaminants by the process of electrostatic attraction. Contaminants are then safely broken down into oxygen ( $O_2$ ) and water ( $H_2O$ ) vapor. Hydrogen peroxide is odorless, colorless and safe to use in occupied spaces. According to the Occupational Health and Safety Administration (OSHA), exposure to one part per million (1.0~ ppm) of hydrogen peroxide is considered safe throughout the day. ActivePure® Technology produces only 0.02 ~ 0.04 ppm, well below the OSHA limit.

### Hydroxyls

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Another important oxidizer created by ActivePure® Technology is hydroxyls. Hydroxyls ( $OH^-$ ) are safe, naturally occurring, powerful oxidizers that quickly and safely neutralize many airborne and surface contaminants, odor-causing bacteria and chemical VOCs. As part of the ActivePure® process, hydroxyls are formed when an ultraviolet light of specific wavelengths is absorbed by the unit's proprietary coating. The coating strips the hydrogen (H) atoms from water molecules ( $H_2O$ ) in the ambient air, forming negative hydroxyls ( $OH^-$ ). These hydroxyls break down carbon and hydrogen-based VOCs and other organic contaminants, converting them into harmless carbon dioxide ( $CO_2$ ) and water ( $H_2O$ ) vapor.

While extremely effective at destroying odors, bacteria, VOCs and other contaminants, hydroxyls are completely safe for human, animal and plant exposure indoors. The hydroxyls produced by ActivePure® Technology are the same as those produced naturally in the earth's atmosphere by the reaction of UV rays and water vapor, and function to safely and naturally "scrub" and decontaminate indoor environments.

## Hydroxyl Radicals

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The hydroxyl radical, •OH, is the neutral form of the hydroxyl ion (OH<sup>-</sup>). Hydroxyl radicals are diatomic molecules that are highly reactive, so reactive that they are instantly neutralized when they contact organic compounds such as fungi, bacteria viruses and many chemical VOC's by cracking the molecular bonds. Like the Hydroxyl ion, Hydroxyl radicals are formed by the reaction of UV light disassembling water vapor (H<sub>2</sub>O) to get a hydrogen atom (H) and oxygen (O<sub>2</sub>) which are combined together to form the hydroxyl radical (\*OH). Hydroxyl molecules are so small that 10 billion of them would fit into one raindrop and because they are so quickly reactive, they are completely safe for human, animal and plant exposure indoors.

## Super Oxides

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Super oxides are oxygen molecules that arise when free hydrogen atoms (H) combine with ozone (O<sub>3</sub>) are created in small amounts by nature in the air. When combined, they form the powerful oxidizers oxygen (O<sub>2</sub>) and hydroxyls (OH<sup>-</sup>). ActivePure<sup>®</sup> Technology utilizes a UVC light source, naturally occurring ozone (O<sub>3</sub>), humidity and a photo catalyst to create powerful super oxides that eliminate bacteria, viruses, mold and other contaminants. This technology is not only safe for human exposure, but is significantly more effective at destroying contaminants than simple UV technology alone. In the process of creating super oxides, ActivePure<sup>®</sup> actually reduces the amount of ozone (O<sub>3</sub>) that naturally exists in the air.

Super oxides have been utilized for decades in food processing plants, hospitals, and dental and doctor's offices to control environmental contamination and disinfect safely without chemicals.

## Product Efficacy and Testing

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ActivePure<sup>®</sup> Technology has consistently proven its ability to safely control and neutralize contaminants such as viruses, bacteria, mold, fungi and VOCs in numerous tests and studies, without harm to humans, animals and plant life. Extensive laboratory testing conducted at Kansas State University showed ActivePure<sup>®</sup> Technology to be effective against H1N1, H5N8, MRSA, Staph, Streptococcus, E-Coli, Listeria, Bacillus spp, Stachybotrys Chartarum and more. These university studies have shown that ActivePure<sup>®</sup> can reduce at least 96.4% and as much as 99.99% of surface and airborne contaminants within the first 24 hours.

Further testing was commissioned at the University of Cincinnati Center for Health-Related Aerosol Studies to investigate ActivePure<sup>®</sup> Technology's kill rate for airborne bio-contaminants. These tests established the extraordinary effectiveness of ActivePure<sup>®</sup> Technology in safely destroying contaminants. In the tests, 90% of the airborne pathogens measured were reduced in only 30 minutes, a rate 50 times more effective than normal filtration.

## Ozone

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Ozone (O<sub>3</sub>) is created naturally by nature and is present in our air, and can also be created by man-made technologies. The EPA has determined that ozone at levels in excess of 0.07 ppm may be damaging to health. The state of California has implemented even tighter ozone levels at 0.05 ppm. ActivePure<sup>®</sup> Technology has been proven to create only minuscule amounts of ozone, at levels over one thousand times lower than the EPA safeguard levels. Moreover, ActivePure<sup>®</sup> Technology actually converts and lowers naturally occurring ozone as described above, as it creates safe super oxides (O<sub>2</sub><sup>-</sup>) which in turn eliminate harmful pathogens.

## Space Foundation - Technology Certified

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The Space Foundation has recognized ActivePure<sup>®</sup> and our company for utilizing technologies originally invented for use in space programs to eliminate VOCs and other contaminants and adapting these technologies for everyday use. ActivePure<sup>®</sup> Technology is based on a variation of technology originally developed for use by NASA on the International Space Station and is recognized globally as the only Certified Space Technology in its class. You can only get this technology from us.

## Applications

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Our ActivePure<sup>®</sup> Technology has been successfully and safely used in hospitals, homes, doctor's offices, professional sports facilities and other applications across the world.

Should you have any further questions on our technology please feel free to contact us.



Dr. Troy Sanford, CN, ND