GRC
Glycocalyx Rejuvenation Centers

Pure Air 3000

Ionization - Ions = charged particles that travel out into the environment, charging particulate in the air, which then attracts oppositely-charged particles, allowing them to gain sufficient mass to be filtered or fall to the ground. This **Air technology incorporates 2 forms of Ionization:**

- Needlepoint – 2M ions/cu cm
- "RF Ionizer Effect" produced by an electromagnetic pulse to excite particles inducing a charge and reducing particles in the air.

Ozone, (O3), sometimes called "activated oxygen", contains three atoms of oxygen rather than the two atoms we normally breathe. **Ozone is the second most powerful sterilant in the world and can be used to destroy bacteria, viruses, (all air-borne) and odors.**

Ultraviolet (UV) light creates ozone when a wavelength at 185-254 nm (nanometers) hits an oxygen atom. The O2 molecule splits into two oxygen atoms, which combine with another O2 molecule to form ozone (O3).

Photocatalytic Oxidation (PCO) technology generates two key purifying technologies:

- A plasma of positive and negative charges (H+ and O2 -)
- Advanced Oxidation Products (AOP's), a combination of hydrogen and oxygen compounds such as vaporized hydrogen peroxide (H2O2), Hydroxides (OH-), superoxide's (O2 -).

This replicates nature's purifying process of using ultraviolet energy to activate a multi-metal catalyst and convert water vapor into peroxide and hydroxyls. **These powerful oxidizers penetrate the virus cell wall and inactivate the microbe through the process of cell lysing, thus changing the molecular structure and rendering the virus harmless.** The result is the destruction of odors, **Volatile Organic Compounds (VOCs), mold, bacteria, and viruses. (All are air-borne)**

Clinic Overview – Volatile Organic Compounds
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Volatile organic compounds (VOCs) are gas emissions that are often off-gassed by household products—such as furniture, paint and cleaning solutions—and can significantly impact the air quality inside your home. According to the EPA, indoor air can contain VOC concentrations that are consistently up to ten times higher than outdoor air. These emissions are made up of a wide variety of chemical compounds, many of which are known to cause harmful health effects.

Children are especially vulnerable to the harmful effects of VOC exposure because their developing organs and internal structures process pollutants differently than adult bodies. They also have higher respiratory rates than adults, meaning that they breathe in more air (including any VOCs therein) relative to their body weight than adults do. Additionally, children explore and experience the world in ways (such as crawling on the carpet or putting toys in their mouths) that are more likely to expose them to higher levels of VOCs.

Children in homes with higher VOC concentrations may also be more likely to develop asthma, allergic rhinitis, and eczema than children who have had less VOC exposure (Choi et. al, 2010; and there are other adverse health effects caused by VOCs, including:

- Headaches
- Nausea
- Eye, nose, and throat irritation
- Kidney, liver, and central nervous system damage
- Loss of coordination
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Where is your child exposed to VOCs?

VOCs can come from a surprising number of sources (including many items marketed explicitly to children). Below, we discuss some of the top household products that are known for their harmful chemical emissions.

Children’s furniture

Children’s furniture that is made with pressed wood, such as plywood or particle board, contains formaldehyde, a known carcinogen, according to the CDC. Pressed wood is often found in build-at-home furniture, even cribs, and can off-gas formaldehyde into your child’s room. Permanent-press fabrics used in furniture upholstery can contain formaldehyde as well.

To avoid high-VOC furniture, look for solid wood products free from paints, stains, and sealants. A no- or low-VOC certification on the label, such as the Greenguard certification for furniture and OEKO-TEX certification for textiles. curchase used furniture that has already gone through the most severe off-gassing phase.

Children's clothing

Many children's clothing items, especially pajamas, are made with chemical flame retardants that are often off gassed while the clothes are worn. Formaldehyde can also be found in certain types of children's clothing. Considering the extended lengths of time that your children are exposed to the chemicals present in the clothes that they wear, it makes sense to look for safer alternatives. Low-VOC clothing is often made with organic materials or labeled with a safety standard certification such as OEKO-TEX (Babylist.com has a few options you can consider for your child).

Plastic food storage

When packing your child's lunch, it is important to know the type of plastic you are using. Avoid lunchboxes and sippy cups made with the following types of plastic:

- Polycarbonate (plastic #7), which contains Bisphenol A (BPA), a hormone-disrupting chemical
- Polyethylene terephthalate (plastic #1), which contains harmful phthalates
- Polyvinyl chloride (plastic #3), which contains dioxins, a known carcinogen

While it may not be feasible to switch completely to glass food storage containers—especially when packing children's lunches—you can still switch to products less likely to leach chemicals into the food they carry. Safer plastics include high-density polyethylene (plastic #2), low-density polyethylene (plastic #4) and polypropylene (plastic #5). Look for these numbers on the container labels to determine whether they are safe.

Children's toys

Whether a toy is made from wood, plastic, textiles, or a combination of the three, it could potentially off-gas a wide range of harmful VOCs. Toys manufactured with pressed wood contain formaldehyde, while plastic toys can harbor the chemicals discussed in the previous section. To avoid most toy-related VOC emissions, look for toys from manufacturers that are transparent about each product's components.

Carpets

The VOCs off-gassed by carpets mainly come from formaldehyde and 4-phenylcyclohexane in the adhesive used to glue the carpet to the floorboards. Fortunately, some states have implemented mandatory VOC emissions standards for all new carpet installations. Additionally, companies like Home Depot and Green Building Supply offer a variety of low-VOC flooring options.

Personal care products

Often, personal care products marketed to children, such as fragranced soaps, shampoos, and cosmetics, are made with cheaper, more colorful ingredients than products for adults. These products, though they may seem more appealing, can contain harmful VOCs, such as formaldehyde. In fact, the Campaign for Safe Cosmetics released a report in 2016 that found at least one VOC in 20% of the 39 children's

cosmetics items tested. To avoid harmful VOCs in your soaps, laundry detergents, dryer sheets and other personal care products, look for fragrance-free products and check the Environmental Working Group (EWP) database for safe alternatives.

Paint

A fresh coat of paint can certainly brighten up a space or object, but the smell can be harmful to your health. Many paints, including children's craft paints, can off-gas VOCs include toluene, trimethylbenzenes, ethyl acetate and tetrachloroethene (Chin et. al, 2014. Fortunately, major retailers, like Home Depot and Green Building Supply sell interior paints with no and low VOCs. For a safer craft paint, choose acrylic paint over enamel and latex paints. You can also find no- or low-VOC paints made with plant-based dyes.

Chemical cleaning sprays

Cleaning sprays can contain a broad variety of VOCs that can be off gassed even when the product is not in use. Some VOCs present in cleaning products include naphthalene, d-limonene, a-pinene and chloroform (Chin et. al, 2014). When shopping for cleaning supplies, you can look for the EPA's Safer Choice label to find products that meet strict emissions and performance standards. Additionally, you can try our ten ways to make your home smell fresh without sacrificing air quality.

Reducing your child's exposure to VOCs

Knowing which products contain high levels of VOCs is an essential part of learning how to improve your home's indoor air quality. In addition to following the guidelines when shopping for furniture, toys and other household products, there are additional steps you can take to protect your child from VOC exposure.

Increasing the ventilation in your home and using air purifiers are all ways to help decrease existing household VOC concentrations. The EPA also recommends:

- Storing unopened paint and cleaning supplies away from the home, such as in a shed or detached garage.
- Safely throwing away all partially used containers of unneeded or old chemicals.
- Keeping paints and cleaning chemicals out of reach of children and pets.

Dr. Cos "Trying to remove VOC sources from your home may seem overwhelming at first, however utilizing proven air purifier solutions, like the PureAir3000 is the first step. but the effort is worth it to protect your children and yourself from harmful emissions."