# Indoor Air Purification

While most discussions about pollution focus on the outdoor environment, most people spend 90% of their time indoors. The EPA has reported that indoor air pollution levels can be 100% greater than the air outside. Due to these factors, it is important for homeowners and contractors to focus not only on indoor comfort, but also air quality.

### Types of Contaminants

In general, homes tend to have three varieties of contaminants.

- Particulates – These are objects floating in the air which, once settled on surfaces, you can sometimes see. They include dust, dander, and pollen. They can trigger allergic reactions for many and can be particularly frustrating for homeowners during certain times of the year (especially for pollen).
- Microbes – Microbes are living organisms that can make one sick. These include bacteria (i.e., MRSA, E. Coli, Staph, Strep, etc.), viruses (cold, flu, SARS-Cov-2, etc.), and mold spores.
- Gases – This includes volatile organic compounds (VOCs) and a variety of odors. VOCs come from chemicals brought into the home – candles, cleaning products, paints/adhesives, as well as off gassing from new products.

### Air Purification Technologies

Today, there are generally four technologies used to limit indoor contaminants.

- Filtration –Virtually all homes use standard pleated filters, but this can include HEPA filters, and electrostatic air cleaners. These work well for large particulate removal, but they don't remove fine particles, microbes, or gases.
- Ionizers – These systems produce negative and positive ions which are circulated through the living space. The ions statically charge fine airborne particles making them cling to other particles until they are large enough to be filtered or fall out of the air.
- Ultraviolet Germicidal Irradiation (UVGI) – UV lights operating at wavelengths from 200-300 NM kill living organisms. Effective use of UVGI requires either significant exposure time or very powerful UV lights. UVGI works best on surfaces like the HVAC coil, where organisms can be stationary and have adequate exposure time for them to be rendered harmless.
- Photocatalytic Oxidation (PCO) – These air purifiers use a UV-C light source to activate a catalytic process that breaks down microbial pollutants in the air like bacteria, viruses, and mold.

### PCO Technology and the Comfort-Aire® Whole Home Air Purifier

To go into greater detail than above, PCO technology uses a UV-C light source to react with a catalyst, in the presence of water (hydrogen), to create hydroxyl radicals and ion oxidizers that are effective in reducing harmful microorganisms. PCO technology has been found to be very effective because it is able to purify air very effectively without the longer exposure time or power required of UVGI.

The Comfort-Aire® 00700 is primarily a PCO air purifier. It is installed in the ductwork and uses two UV-C sources (one LED, the other a traditional lamp) and two catalyst surfaces to generate two PCO fields. The two UV-C sources produce light at different wavelengths, ensuring a more robust irradiating impact. Additionally, the UV-C lamp is positioned so roughly half of its UV-C emissions are directed at the airstream for an additional UVGI effect. The PCO and UVGI processes together have been shown to reduce up to 99.9% of airborne microbials passing through the system.

Ultimately, it is important for all homes and businesses to have some variety of air purification. At the least, this should take the form of a pleated filter. Fortunately, most homes use traditional split systems for which pleated air filters are already installed. Moving beyond this, a more robust system is recommended to limit odors, pathogens, and other contaminants. Utilizing the Comfort-Aire® 00700 ensures that homeowners are benefiting from the best of the options – the filter already installed in their system and the benefits of PCO and UVGI that come from the 00700.