Air Care for Lung Health: A Buyer's Guide to Air Purifiers

Shopping for a quality air purifier can be an overwhelming experience. Questions that you will want to consider are: What type of filtration do I need? How large of an area do I need to purify? Do I have a 'sick' building that needs microbial purification? Hopefully this guide will help you choose the best air purification system for your specific needs.

1. Volatile Organic Compounds (VOCs)

There are a number of VOCs that can be detected in a normal household environment. Cleaning agents, varnish, adhesives, paint, disinfectants and items like new furniture, flooring or carpeting all emit odors that can be very irritating or even toxic. Smoke from fires, cooking or tobacco is also a common airborne contamination.

Optimal systems for this type of contaminant include activated carbon filters which have a very large surface area to adsorb VOCs, gases and smoke. Some activated carbon is treated to trap chemical fumes ("chemisorbing") very effectively. The larger the carbon filters, the more it will trap and the longer it will last. Carbon filters cannot be regenerated and so, when it is full of contaminants, must be replaced.

2. Microorganisms

Often in a 'sick' building or home, especially those affected by storms and flooding such as the recent devastation of the hurricane Sandy on the East Coast, various microorganisms invade the walls and interior of the building. These organisms include pathogens, bacteria, mold, fungus and viruses. Even in a normal home environment, especially those with children, sickness is a frequent visitor, leaving a home infected with all sorts of viruses.

Quality air purifiers will often have a component that helps to destroy microbes and very fine particles such as viruses. Germicidal filters and antimicrobial filters typically use UV irradiation to kill the organisms listed above. Sometimes HEPA filters are treated with certain antimicrobial agents. Titanium Oxide technology is the newest type of air purification and can purify microbes and particles from the air down to 0.01 microns. This means that Titanium Oxide can kill and filter viruses.

3. Particulate Matter

Allergies are usually caused by airborne particles such as pollen, dust mites, dust, pet dander, spores, mold, etc. Airborne particles are mostly measured in microns, which is approximately 1/25,400th of an inch. The human eye can spot to around 40 microns and the dot at the end of this sentence is about 615 microns in diameter. Typical sizes of particles (in microns) you will find in the household are listed below:

- Pollen: 10 – 1000
- Hair: 5 – 200
- Dust Mites: 100 – 300

- Cement dust: 3 – 100
- Saw Dust: 30 – 600
- Mold spores: 10 – 30
- Mold: 3 – 12
- Textile dust: 6 – 20
- Other spores: 3 – 40
- Wood-burning particles: up to 2.5
- Fly ash: 1 – 1000
- Asbestos: 0.7 – 90
- Paint pigments: 0.1 – 5
- Face Powder: 0.1 – 30
- Insecticide dusts: 0.5 – 10
- Yeast cells: 1 – 50
- Bacteria 0.3 – 60
- Tobacco smoke: 0.01 – 4
- Viruses: 0.005 – 0.3

The absolute best filtration units for these household particles are HEPA filters with pre-filtration units. HEPA filters are fine mesh fibrous units that catch particles with an efficiency of 99.97%. Some HEPA filters are medical grade and are rated 99.991% efficient. Medical grade HEPA filters will filter particles as small as 0.3 microns and are wonderful air purifiers for allergy sufferers and asthmatics in particular. Adding an additional UV unit as a germicide will take care of the 'living' particles that the HEPA filter cannot catch. Titanium Oxide technology will also catch the smallest of the small particles, including most viruses.