

How HEPA Got Its Start

High-Efficiency Particulate Air (HEPA) filters have been a growing trend in the cleaning industry since their invention in the 1940's. Initially, the filters were designed to remove radioactive dust particulate contaminants in atomic bomb shelters. Currently, HEPA filters are used to improve indoor air quality in homes, healthcare, education and office facilities around the country.

In order for one to truly reap the benefits of HEPA filters, however, the entire process must be understood. Multiple steps must be taken to ensure the system functions properly.

Why HEPA is So Popular

According to the American Academy of Allergy, Asthma and Immunology, 25 per cent of Americans suffer from allergies. What's more, 20 million people suffer from asthma, including 9 million children. Parents, teachers, professionals and people in the jan-san industry are realizing the importance of indoor air quality now more than ever. After all, it does little good to maintain one's home when public places are full of irritants and allergens dragged in on shoes and personal effects.

In all, asthma costs the U.S. \$10 billion annually in direct health care costs and lost productivity. That is why HEPA filters appear to be such an amazing solution. The user simply pops one in the vacuum and the problem is solved – right?

How True HEPA Works

In a perfect world, true HEPA vacuums remove 99.97% of particulate matter in the air, down to 0.3 microns in size. (By comparison, a human hair is 1.0 micron in size.) A high-powered motor forces air through the filter at a high rate, trapping up to 10,000 particles per minute. This super filtration system improves indoor air quality and reduces contaminants to levels acceptable in the most important environments, like clean room fabrication labs and healthcare facilities.

People with allergies and asthma, as well as offices with sick building syndrome, can expect to see dramatic improvements in air quality. In theory, HEPA is one of the best solutions to indoor air quality problems.

It's Not About the Filter

Unfortunately, it takes more than just a filter to create a true HEPA machine.

Studies have found that as many as 50% of all HEPA vacuums are not working properly – usually due to poor vacuum structure, operator error or lack of maintenance. Such machines filter as little as 80% of the processed air, blowing it back out with all its pollutants in tow.

Sound vacuum structure is required for the filter to perform at capacity. HEPA vacuums must be tested in two key areas before being certified as “true HEPA”. First, units are checked to ensure there is no dust leak around the filter. This means that 100 per cent of the air processed must pass through the filter – not around it or through leaks in the vacuum body. The test is performed by using the vacuum to suck up dyed smoke and observing where it seeps out. During the smoke-dye test, it is instantly visible if the vacuum leaks and whether the problem lies with the motor, casing, dust bag and/or filter. If a vacuum does leak, it is not qualified as true HEPA, even with a HEPA filter installed.

Secondly, the amount of air, measured in cubic feet per minute (CFM), must not exceed the filter's capacity. If it does, this is a clear sign that some pollutants are not being filtered and are escaping back into the air. Vacuums and filters both come with CFM ratings from the manufacturer, and it is imperative the right combinations are chosen. Purchasing the least expensive part does not guarantee an effective fit.

Filter installation and replacement require special training and dedication on the part of the maintenance worker. If not installed properly, processed air bypasses the filter and escapes without being cleaned. Furthermore, the filters and units can also be easily damaged during installation if not done by a careful, well-trained worker.

Filter replacement must also happen on a regular basis. HEPA filters, even when treated with antimicrobial solutions, can still quickly turn into breeding grounds for mold, fungus and bacteria. Because there is no set replacement schedule, the user must employ his or her expertise in the matter to determine when it is time for a new filter. Keeping the dust bag empty is one way to prolong the life of a HEPA filter.

How to Choose a HEPA Vacuum

Considering all the education required, choosing a HEPA vacuum may seem like a daunting task. But there are a few simple ways you can make sure you are getting true HEPA.

First, purchase vacuums and filters from a reputable company. Make sure their products are tested properly, are labeled “true HEPA”, and carry warranties. One year is standard; three is ideal. Also, look for companies that carry the Carpet and Rug Institute (CRI) seal of approval. This ensures the vacuums and filters have been tested and meet certain scientific standards for soil removal. One company, ProTeam, is not only CRI certified but has partnered with the American Lung Association to educate on indoor air quality.

Secondly, make sure the manufacturer you choose offers true HEPA replacement filters designed specifically for the vacuums they sell. As mentioned before, this proper combination is key in reaching the 99.97% level of particle removal.

Finally, ask the manufacturer about training materials and other literature that may be available to educate your work force. These tools are an important part of maintaining the HEPA system you choose to employ.

With the right information, education and maintenance, you can be sure your HEPA system is working as true HEPA. You and your clients will notice the difference.

