

Healthy Indoor Air Series

Vacuum Cleaners

Why is vacuum cleaner efficiency important?

The recent increase in the number of asthma cases has heightened our awareness of how indoor air quality affects our general health. Asthma is one of our nation's most common chronic health conditions. Many substances can aggravate allergies or increase the severity of asthma symptoms in individuals who are sensitive to these allergens or irritants. Vacuum cleaners can remove many of these irritating particles from the air.

How does a vacuum cleaner help clean the air?

The filtration efficiency of a vacuum cleaner can significantly affect airborne dust and allergens in indoor air. To prevent these minute particles containing allergens from being re-circulated into the air, a vacuum cleaner's filtration system must be very efficient at trapping small particles. To really get a carpet clean, pass the vacuum cleaner over the target area as many as eight times. Only use vacuum cleaner bags until they are half filled. As the bag fills up with dirt and dust, airflow becomes limited and the vacuum cleaner loses its suction capacity.

How are allergens reduced?

Using a vacuum that has a HEPA or ULPA filter can help reduce allergens. **HEPA** (High Efficiency Particulate Air) is a filter that meets standards for collecting 99.7 percent of all particles at 0.3 microns (a human hair is about 60 to 80 microns). Most HEPA filters are disposable and must be replaced every 6 to 12 months. A HEPA filter is placed at the last stage of filtration. Then, all the air flowing through the vacuum must pass through the HEPA filter.

ULPA (Ultra Low Penetration Air) is a filtering efficiency specification for filters that retain all particles to 0.12 microns at an efficiency rate of 99.999 percent.



Particles below 10 microns are invisible to the human eye.

The most common airborne particle size is 2.4 microns.

The most harmful particle size is less than about 1 micron.

If your family has anyone who suffers from chronic allergies or asthma, a central vacuum system is the best choice. Dirt is either collected in a container in the basement or garage or pumped directly outside the house, not back into the indoor air. Central vacuum cleaners are generally more expensive, and consideration should be given to the cost of installation as well as the design. There are no onboard tools, and the system utilizes longer hoses than typical vacuums.

What other options are available?

Micron and electrostatic filters have high filtration efficiencies, around 98 percent at 0.3 microns. These filters trap fine dust particles and create an electrostatic charge as air passes through them. Micro-lined vacuum bags are available for most major vacuum cleaners. They are 2-ply construction and contain Bactrastat™, an anti-bacterial agent. These filters offer 99.7 percent filtration.

What do you look for in a vacuum cleaner to reduce allergens?

- Be sure the cleaner has enough motor power to suck up all particles. Uprights typically have 7- to 12-amp motors; most experts prefer 12-amp units. Amperage alone does not indicate cleaning power; the vacuum design is important, too.
- Look for a completely sealed unit. HEPA filters are of no use if particles can escape through the sides of the cleaner. Vacuum cleaners with HEPA filters are not designed to be leak-proof.
- Look for a vacuum with an exhaust filter; some even have motor filters.
- Look for 'true' HEPA filters. Some filters may read "HEPA-like" or "HEPA-type." HEPA-like filters remove 99.97 percent of particles 5 microns in size.
- HEPA filters are effective, but costly. The cost of replacing HEPA filters (every 6 to 12 months) is about \$1 a week.

- An upright vacuum or a canister with a power nozzle is best for carpet.
- A canister vacuum with a power nozzle is good for cleaning blinds, upholstery, draperies, etc.

The Carpet and Rug Institute (CRI) says a good vacuum cleaner should do these three tasks well:

- Remove soil from surfaces
- Contain dust within the filtration bag and the machine itself
- Keep carpet clean without damaging it

For more information

Contact your local University of Illinois Extension office or visit these web sites:

University of Illinois Extension
<http://www.solutions.uiuc.edu>

Healthy Indoor Air for America's Homes
<http://www.healthyindoorair.org>

Carpet and Rug Institute
<http://www.carpet-rug.com>

