



Experts estimate that 35 million Americans suffer from upper respiratory symptoms that are reactions to airborne pollen.

•WebMD Public Information

An average person takes approximately 17,000 breaths per day.

64,000 people in the USA may be dying prematurely each year from cardio-pulmonary causes linked to air pollution

•National Resources Defense Council

The consequences of air pollution on cardiovascular health may be similar to the hazards of secondhand smoke.

•Dr. Andre Nel, Chief of NanoMedicine at UCLA

## INSTALL TWO HEPAS AND CALL ME IN THE MORNING

Installing HEPA filters might just save your life, according to a recent study. The quality of the indoor air that we breathe has a direct effect on our cardiovascular system.

Fine airborne particles can damage the endothelium, which is the innermost layer of the arteries and heart. The damage leads to atherosclerosis. An intimidating term that refers to fats, cholesterol, platelets, cellular debris and calcium being deposited on the walls of blood vessels. Buildup of these deposits on arteries may lead to a heart attack or stroke.

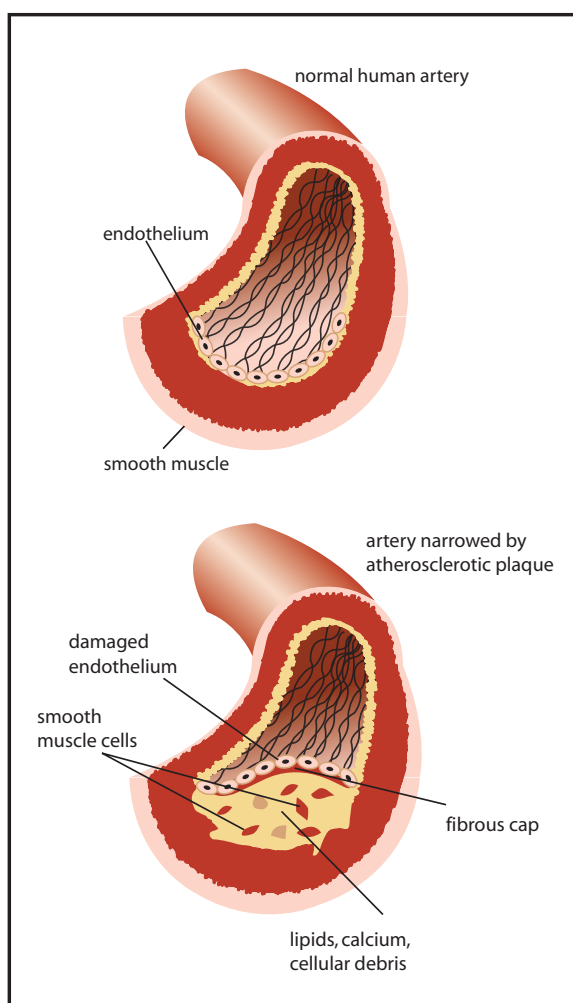
A study published in the "American Journal of Respiratory and Critical Care Medicine" found that indoor air quality has a significant effect on the cardiovascular system, especially if you are over 50. This study examined 21 healthy couples aged 60-75. They were nonsmokers who lived near roads with heavy traffic. The trial was a randomized, double-blind, cross-over study with two consecutive 48-hour exposures to either HEPA particle-filtered air or non-filtered air in their homes. Researchers measured the amount and chemical properties in the air. After every test, the Microvascular Function (MVF) of each individual was measured.

Why study "fine particles"? A significant portion of air pollution is made of tiny particles found in auto and diesel exhaust, cigarette or other types of smoke, and industrial

stack emissions. These particles are microscopic in size and are easily inhaled into the lungs where they enter the bloodstream. When the particles contact the lining of a blood vessel it causes damaging inflammation.

Researchers expected that HEPA cleaned air would improve MVF but were surprised by the extent of the improvement. HEPA filters removed about 60% of the particles and significantly improved Microvascular Function by 8.1%. This improvement is comparable to a well-working drug. The effects of this study were only measured after a 48-hour intervention so it is possible that if HEPA air filtration occurred earlier and over a longer period of time, there would be greater improvement.

The conclusion was that reduction of particle exposure by filtration of recirculated indoor air for only 48 hours improved MVF in healthy elderly citizens, suggesting high efficiency air filtration may be a feasible way of reducing the risk of cardiovascular disease.



## FILTRAIR INTERNATIONAL DISTRIBUTOR MEETING 2009 WELKOM...BIENVENU...WELCOME !

Filtrair's International Distributor meeting held in October 2008 was a global session with distributors representing 30 countries. Following the success of the distributor meeting in Chicago, IL USA in 2006, Filtrair decided to organize the 2008 meeting near its textile and high-efficiency filter manufacturing facility in the Netherlands. The event took place in a hotel in the scenic Oranjewoud area. The surrounding land was owned by the Royal Dutch family from the 17th to the 19th century.

The program included technical discussions ranging from individual product performance to industry test standards in Europe and the Americas. Select distributors presented specific case studies to their peers on filtration applications including automotive, turbine, and HVAC installa-

tions among others. The meeting provided an excellent format for the exchange of ideas and techniques relevant to current industry challenges. The discussion of filters that lower energy consumption was dominant as the topic is proved relevant from Colombia to New Zealand.

"A highlight of the meeting for me was the sense of partnership between Filtrair and the distributors. My thanks to Anneke for orchestrating the meeting", noted Edward Lyons, President of Filtrair and Vice Chairman of Filtration Group. "However, the eventual success was due to the

fine presentations and the interaction among all participants." Survey responses from the participating distributors and presenters noted overall satisfaction and we look forward to the next meeting!





# FilterTalk

Winter 2009

## GOT A QUESTION FOR US?

Q. How effective is a HEPA filter on tiny airborne particles in high traffic areas?

A. HEPA filters are specifically designed, constructed and tested to assure that they provide extremely high levels of protection against very small particles. In fact, the performance of every HEPA filter is verified before it is shipped to the end user, by testing the capturing efficiency of sub-micron particles.

HEPA and ULPA filters are characterized by their particle removal efficiency in the range of 0.1 to 0.3 microns. This size range encompasses the "most penetrating particle size", meaning that the filter has a higher capture efficiency for particles larger than (and smaller than) the efficiency at the rated particle size.

## Product Spotlight:



AeroStar® HV HEPA

Filtration Group's HV HEPA is the top of the line. No other filter can outperform the HV HEPA's combination of ultra-high particulate efficiency and low resistance to air flow.

The HV HEPA utilizes 430 ft/2 of media to achieve a remarkably low initial resistance of 1.0" w.g. at 2,400 cfm and available in efficiencies up to 99.99% on 0.3 micron particles. The low resistance and high dust holding help make the HV HEPA the best option when designing new HEPA grade air filtration systems, or when upgrading an existing medium efficiency system to a HEPA grade system.

The minimum resistance to air-flow also generates considerable energy savings compared to conventional HEPA filters. The energy savings often exceed the cost of the HV HEPA filter. The HV HEPA is constructed with an anodized aluminum frame producing a light weight filter that is extremely durable and chemical resistant, suitable for the toughest of environments. Each filter is individually tested for actual performance certification.

## COMPARING A MERV 14 FILTER TO A HEPA FILTER

MERV 14 high-efficiency air filters are commonly used in hospitals, industrial applications, and modern commercial buildings. An ASHRAE 52.2

MERV 14 filter is very similar to a 90-95% efficient filter (as tested under the old ASHRAE 52.1 test method). Air filters performing in this range of particulate capture efficiency remove most airborne irritants such as molds, pollens, allergens, and even bacteria. The elevated filtration also helps keep the climate controlled air system clean, maximizing energy efficiency and provides the cornerstone for a healthy indoor air quality (IAQ)

However, when comparing a MERV 14 filter to a true HEPA filter the efficiency data is quite dramatic. Both filters maintain excellent efficiency performance on relatively large 1 micron size particles. As the target particulate gets smaller, down to 0.3 micron, the MERV 14 efficiency drops precipitously when compared to the HEPA. A MERV 14 is considered high-efficiency, yet it is relatively ineffective when removing microscopic sub-micron size airborne particles. (Figure no. 1)

Another way to compare the performance of these two types of filters is measuring the particulate penetration of each on various size

particles. (Figure no. 2) Penetration is essentially the opposite of efficiency. That is, a 90% removal efficiency has a 10% penetration. Typical indoor air contains a very large amount of these sub-micron particles. Even an ISO Class 6 Cleanroom is allowed up to 102,000 particles per cubic meter that are

between 0.3 and 0.5 microns. If the air entering a MERV 14 filter contains 100,000 0.3 micron particles per cubic meter, the air leaving that filter will contain approximately 31,600 particles in that same cubic meter of air. By contrast, that same air exiting a 99.97% HEPA filter will contain only 30 particles.

MERV 14 filters provide exceptional levels of filtration efficiency, and installing a HEPA filter in most applications would be excessive and the benefits not fully realized. Critical applications where microscopic particles are targeted for capture do require HEPA level filtration to protect people and their environment.

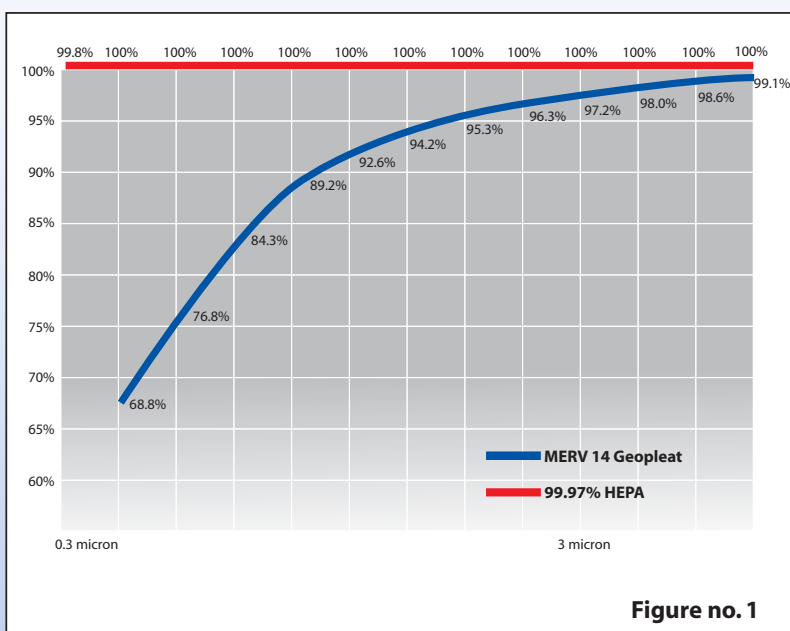


Figure no. 1

Particle Size	MERV 14 Geo	99.97% HEPA
0.35	31,200,000	20,000
0.47	23,200,000	10,000
0.62	15,700,000	1,000
0.84	10,800,000	100
1.14	7,400,000	-
1.44	5,800,000	-
1.88	4,700,000	-
2.57	3,700,000	-
3.46	2,800,000	-
4.69	2,000,000	-
6.20	1,400,000	-
8.37	900,000	-

Figure no. 2

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