

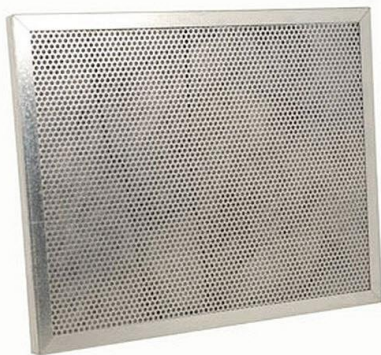
Bird Safety Corner

Mechanical Air Filters

This column will discuss mechanical air filters, including HEPA filters. Please see the separate column for electronic air cleaners (indoor air pollution).

Mechanical air filters capture air particles on some kind of filter media. Particles either become trapped in the filter itself or stick to the surface because of an electrostatic charge. Filters can be either flat or pleated. Filters can be found on portable air cleaners or installed in a central HVAC (heating, vacuum, air conditioning) system. Good air draw is important with all mechanical air cleaners. If the particles don't make it to the filter, they won't be trapped. Air cleaners are rated on **efficiency** and **effectiveness**. Efficiency is a measure of how well the filter removes particles from air that passes through it. Effectiveness is a measure of how well the filter removes substances from a particular space, such as a room. For example, a filter could remove 99% of all particles presented to it, but if the air flow is low, it still won't clear the room of particles because most of the air won't make it to the filter! Make sure you buy a device appropriate to the size of the space you want to clean.

Flat or Panel Filters



Flat filters can be made of many substances, including coarse glass fibers, coated animal hair, vegetable fibers, synthetics such as polyester or nylon, synthetic foams, metallic wools, metals, or foils. Filters are sometimes coated with substances, such as oil, that particles stick to. Flat filters can also be electrostatically charged so that particles stick to them by static electricity. Flat filters will remove pollen, dust mites, cockroach body parts and droppings, Spanish moss, sanding dust, spray paint dust, textile fibers, and carpet fibers. They are usually inexpensive.

Pleated or Extended Surface Filters

Pleated filters are usually more efficient than flat filters because of the increased surface area. They often use smaller fibers than flat filters and are usually made of fiber mats, bonded glass fibers, synthetic fibers, cellulose fibers, wool felt, and other cotton-polyester material blends. Pleated and extended surface filters will remove everything flat filters will remove plus mold, spores, dust mite body parts and droppings, cat and dog dander, hair spray, fabric protector, dusting aids, pudding mix, Legionella, humidifier dust, lead dust, milled flour, auto emission particles, and nebulizer drops. High efficiency pleated filters may also remove bacteria, sneeze droplets, cooking oil, most smoke, insecticide dust, most



face powder, and most paint pigments. They are more expensive than flat filters.

High efficiency particulate air (HEPA) filters are a type of extended surface filter made of submicron glass fibers. These filters have a texture similar to blotter paper. They have a larger surface area than pleated filters and are better at removing particles which can be inhaled. They will remove everything the other filters will remove plus viruses, carbon dust, sea salt, and all combustion smoke. These are the most expensive filters.



So, which filter should you get? We're going to get a little technical now (yes I know, this and the indoor air pollution column have been pretty technical already!). Buying a good filter is often a big expense, and many people with companion animals buy filters, so it's worth spending some time on this so you can make an informed decision. Filters carry a voluntary rating called **MERV (Minimum Efficiency Reporting Value)**, with higher values reflecting better filtration. Flat or panel air filters usually have a MERV of 1 to 4 and will filter larger particles. Pleated or extended surface filters usually

have a MERV of 5 to 13 and a thickness of 1 to 6 inches. They will remove small to large particles. In general, the thicker the pleated/extended surface filter, the higher the MERV and the better it filters. High efficiency pleated/extended surface filters have a MERV of 14 to 16 and a thickness of 6 to 12 inches. HEPA filters have MERV values of 17 to 20. The higher the MERV value, the more efficient the cleaning, but the stronger the air flow needed to go through the filter. If you are installing a high efficiency or HEPA filter on your HVAC system, make sure it has the fan or motor capacity to be able to handle it! Also make sure the seal around the filter is tight.

So here's the dirty little secret. Manufacturers aggressively promote HEPA filters to allergy and asthma patients. Most bird companions think they need a HEPA filter to clean their bird room. BUT all you need is a MERV of 11 to remove animal dander and dust mites. The only real gain with a HEPA filter is to remove smoke particles (but not gas toxins), and you don't smoke around your birds, right?? Filters with a MERV between 7 and 13 are nearly as effective as true HEPA filters and much less expensive. Your best bet is to **look for a pleated filter 1 to 2 inches thick with a MERV of 11 or 12**. As mentioned above, make sure you buy a filter appropriate for the size room you want to clean. Read the label before you buy a filter!!

One more thing. The more particles stuck to a mechanical filter, the less efficient it becomes, so remember to clean your filters regularly!

If you're a real glutton for punishment, check out this excellent document from the EPA called Residential Air Cleaners: A Summary of Available Information. You can see a whole MERV chart there! www.epa.gov/indoor-air-quality-iaq/residential-air-cleaners-second-edition-summary-available-information

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