

## HONEYWELL F300 ELECTRONIC AIR CLEANER OUTSHINES COMPETITIVE UV

Trap bacteria at up to twice the kill rate of germicidal UV lamps.



### Most of today's products don't cut it

These conclusions are based on analyses performed by measuring the UV intensity of several products currently on the market. Given the UV intensity from these products, and calculating the exposure time and distance of particles in a moving air stream, analysis showed that no more than 40 percent of the bacteria passing by the lamps would be killed by these products, compared to almost 80 percent that are captured by the Honeywell F300 Electronic Air Cleaner.

Testing was conducted on the Honeywell F300E1035 (20" x 25") at 2,000 cfm against spore forming *Bacillus subtilis* bacteria. Analysis on UV performance was a calculated single pass kill rate against *Serratia marcescens* bacteria in a 3' long, 12" x 25" return air duct at 2,000 cfm at 70° F based on measured beginning of bulb life UV intensity.

This analysis also assumes the use of new bulbs. As the bulbs age, the intensity drops, reducing the effectiveness to under 30 percent after the specified one-year bulb life.

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### Trapped bacteria quickly die

Testing previously performed at the University of Minnesota has also confirmed that bacteria are killed soon after being captured on the electronic air cleaner cells, disproving the theory that air cleaners are a breeding ground for bacteria.

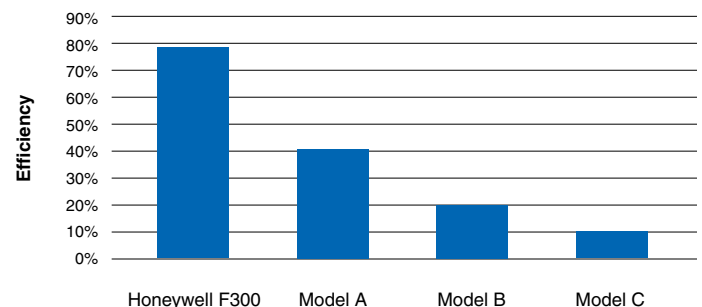
### Activated oxygen = ozone

Beware of the claims made by some UV manufacturers about removing odors. In most of those cases the systems are simply producing ozone. Words like "activated oxygen" or "oxidizing" are generally substitute words for ozone and are not a new technology. Furthermore, UV lamps alone are not a filter. Unless a high-efficiency particulate filter is part of the system, bacteria particles that are killed are not removed from the air, but allowed to circulate throughout the home.

### Honeywell UV also exceeds the competition

Testing of the Honeywell family of UV lights reveals effectiveness of up to 87 percent at 2,000 cfm. Coupled with a Honeywell F300 Electronic Air Cleaner, the Honeywell UV system outshines most germicidal devices.

Single Pass Kill Rate vs. Bacteria



## ELECTRONIC AIR CLEANERS AND VARIABLE SPEED AIR HANDLERS: A WINNING COMBINATION

Easy application, superior performance.



### Improving home filtration

The use of multi-stage furnaces and variable speed air handlers in the residential HVAC market has increased dramatically. This equipment offers numerous advantages for homeowners, including energy savings, quiet operation and easier application of zoning.

But that's not all. The use of variable speed air handlers can also improve the performance of the home's filtration system especially when an electronic air cleaner is installed.

Here's why: When a variable speed air handler operates at a slower speed, particles spend more time in the electronic air cleaner's collector section, increasing the likelihood of being captured. The difference is significant — the collection efficiency is increased to well over 90 percent, even down to 0.3 micron particles.

Application of the Honeywell F300 Electronic Air Cleaner is easy. The airflow switch automatically turns on the air cleaner in most applications. The switch is calibrated to make contact at a velocity of 200 ft/min. This converts to the following minimum airflow rates for automatic activation of the airflow switch.

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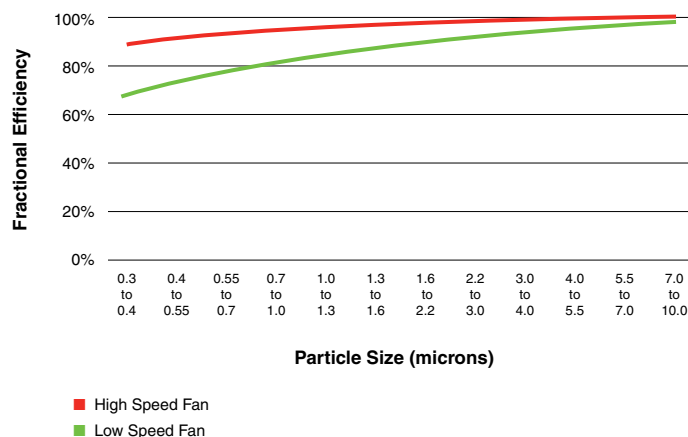
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**Electronic Air Cleaner With Variable Speed Systems High vs. Low Speed**



### Adapting for lower airflow rates

If operation is desired at lower airflow rates, the Honeywell F300 Electronic Air Cleaner can easily be adapted to turn on in response to signals from the Honeywell F300 Electronic Air Cleaner terminals on the fan control board in the furnace. To adapt an air cleaner to operate in this mode, simply cut the plug from the power cord and wire directly to the terminals on the fan board, then clip the airflow switch disable jumper.

In this mode of operation, the airflow switch is bypassed, allowing the air cleaner to operate whenever it is supplied with power from the fan board. This will cause the air cleaner to cycle on and off with a call for fan, regardless of the speed. Some variable speed systems with low air flow may require hard wiring to the fan timer board and by passing the air flow switch.

For systems with variable speed air handlers, especially those with cost-effective ECM-driven blowers, we recommend running the blower continuously on a low speed to maximize the benefits of your electronic air cleaner. A Honeywell F300 Electronic Air Cleaner and a variable speed air handler are truly a winning combination!

## AIRFLOW VITAL TO HVAC SYSTEM PERFORMANCE, COMFORT

High pressure drops across media filters can choke off airflow and reduce comfort, system efficiency and equipment life. But the Honeywell F300 Electronic Air Cleaner offers a very low initial resistance that stays low a long time.



### Long-term low pressure drop

Different types of air cleaners exhibit very different characteristics regarding restriction of airflow in a system, both initially and after loaded with dust from use. While all media air cleaners increase their resistance to airflow over time, the initial resistance to airflow varies greatly by model. Electronic air cleaners, on the other hand, combine the best of both worlds — offering a very low initial resistance to airflow that stays low over very long periods of time; in some cases even years, according to test data.

### Maintaining rated airflow

While HVAC systems are designed to allow for some pressure drop across the air filter, most experts agree that an appropriate pressure drop limit in residential systems is 0.5" H<sub>2</sub>O. The data from this testing showed that at rated airflow, only the Honeywell F300 Electronic Air Cleaner is able to operate with a pressure drop of less than 0.5" H<sub>2</sub>O through any significant amount of loading. In fact, one-inch Filtrete® and Dynamic products both had an initial pressure drop of nearly 0.5" H<sub>2</sub>O, which then increased to double the recommended limit when loaded with 30 grams of dust (about 3 months' worth).

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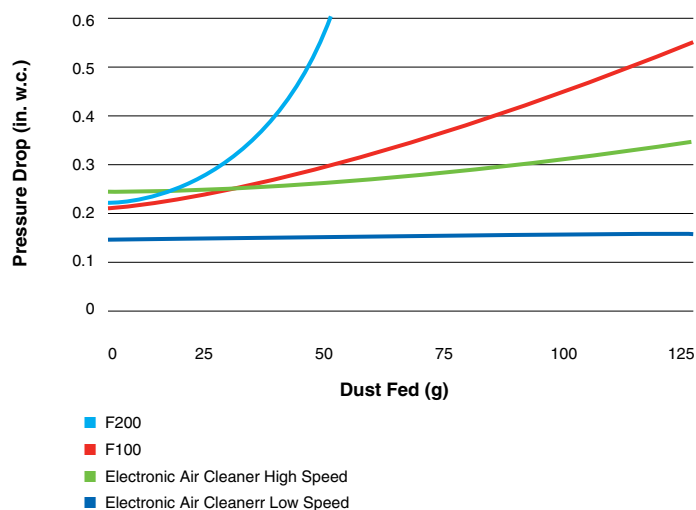
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Lifetime Comparison



### Impact to airflow

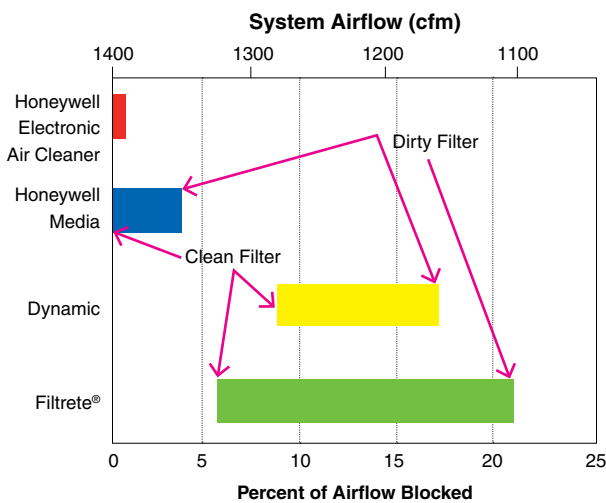
If a system was designed for 1,400 cfm, allowing for a pressure drop of 0.2" H<sub>2</sub>O across the air cleaner, when the filter is changed — its end-of-life point — it has collected 30 grams of dust, to match our test results. How is the system airflow impacted by the choice of filter?

For starters, only the Honeywell F300 Electronic Air Cleaner has an initial pressure drop that is low enough to allow the system to deliver 1,400 cfm. The Filtrete and the Dynamic filters have an initial resistance to airflow that is too high to allow the system to deliver its design airflow. And as these filters load, the resistance to airflow increases. By the time that 30 grams of dust has been collected, the system airflow has been substantially reduced and restricted.

In contrast, the Honeywell F300 Electronic Air Cleaner exhibits virtually no increase in resistance to airflow, allowing full design airflow to be delivered throughout the typical life of a media filter.

## AIRFLOW VITAL TO HVAC SYSTEM PERFORMANCE, COMFORT

High pressure drops across media filters can choke off airflow and reduce comfort, system efficiency and equipment life. But the Honeywell F300 Electronic Air Cleaner offers a very low initial resistance that stays low a long time.



### Reduced airflow reduces much more

A significant reduction of system airflow will impair the operation of a forced-air system. It may reduce comfort in the house because less air will reach the rooms at the end of the duct runs. The heating and cooling equipment will operate less efficiently and, over time, may reduce the operating life of the equipment. Fortunately, these problems can be avoided by understanding the effect of pressure drop on system performance and installing a Honeywell F300 Electronic Air Cleaner.

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### We're "collecting" data

Testing shows high-efficiency electronic air cleaners collect particles known to trigger allergic reactions. A recently completed trial by a nationally recognized independent laboratory tested the ability of the Honeywell F300 Electronic Air Cleaner to collect specific bio-aerosols from the air passing through the unit. The aerosols tested included fungi, bacteria, mite antigen from house dust, cat antigen from house dust and ragweed pollen antigen.

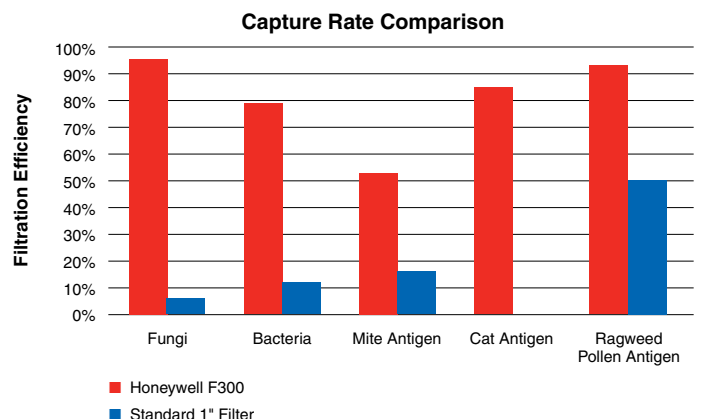
### High allergen-capturing performance

As you can see, the Honeywell F300 Electronic Air Cleaner demonstrated very high collection efficiencies against these allergens. More than 90 percent of fungi and ragweed pollen antigen were captured, as were more than 70 percent of bacteria and cat antigen and nearly 60 percent of mite antigen. Compared to a standard 1-inch filter, the Honeywell F300 Electronic Air Cleaner captured up to 10 times more of the bio-aerosols tested.

### Tell your customers about this trial

Explain which allergens are captured with a Honeywell F300 Electronic Air Cleaner and you'll have your customers' full attention. Then show them the data documenting the trial results — and you'll have them buying.

And we're not done yet — stay tuned for more Honeywell research in this area.



## WHITE DUST?

Airborne particles revealed.



### Capturing the unseen

Visible dust makes up only one percent of all the particles in air. The vast majority of particles are microscopic. These unseen particles “ride” gentle air currents inside your home and remain airborne for a long time. How long they float in the air depends on their size. Relatively “heavy” dust particles (more than 5 microns) tend to settle out of the air in 20 minutes or less. They form the dust that’s easily wiped away from tables and other surfaces. Middleweight particles (from 1 to 5 microns) may remain airborne for hours before falling out of the air. Lightweight particles (less than 1 micron) can remain suspended permanently in the air. And particles sized less than 1 micron can gain the easiest entry to your body and place the biggest burden on its defense system. Fortunately, a Honeywell F300 Electronic Air Cleaner is a superior whole-house filtration technology for capturing the smallest particles.

### Effective filtration is essential

The chart shows the particle sizes of common airborne contaminants. Ninety-nine percent of particles are less than 1 micron. For perspective, it’s useful to know that your upper respiratory tract — your nose and throat — generally filters out airborne dust and particles larger than 10 microns. Consumers who are interested in using an air cleaner to help reduce levels of airborne allergen particles often choose the most efficient air cleaner available to increase the likelihood of capturing the offending particles.

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### What size are they?

Contaminant (in microns)	Light	Medium	Heavy
Human hair (3-200)			•
Pollens (10-100)			•
Pet dander (0.2-100)			•
Plant spores (10-70)			•
Fungi (0.5-5)		•	
Bacteria (0.3-3)		•	
Tobacco smoke (0.01-1.0)		•	
Virus (0.003-0.04)	•		

Source: Stanford Research Institute. This chart is intended to provide information on particle size only. It is not intended to imply our air cleaner will be effective at removing all of these particles.

These very small particles are only removed from the air when they strike a surface and stick to it. You can see evidence of this when you take down a picture and see the lighter wall behind the picture. These particles are sometimes referred to as staining particles. Vacuuming and dusting will not remove staining particles from a surface — washing and laundering is required.

Large particles are fairly easy to remove from the air and a standard furnace filter can do the job. In fact, most large-size particles settle out of the air before ever entering into the heating or air conditioning system where the filter can remove the particles. This is what you see as dust and lint on your furniture and frames. These large size particles are naturally light in color, so why do they appear dark when you wipe them up with a white dusting cloth? That is because the smaller staining particles will adhere themselves to the larger particles. These grey (dirty) particles then blend into the surface color of the furniture and become less noticeable.

In order to remove small particles, you need a high-efficiency filter. These small particles remain suspended in the air long enough to enter the heating and cooling system and pass through the filter. One irony of removing staining particles from the air is that house dust on the furniture stays light in color and becomes more visible. There is no more dust than before, but you can see it better. This is a visible sign of the removal of microscopic particles that can stain your furnishing, draperies and carpeting.

## WE'RE "COLLECTING" DATA

Testing shows high-efficiency electronic air cleaners collect particles known to trigger allergic reactions.



### What's that?

**Antigen** — An antigen is a substance that, when introduced into the body, stimulates the production of an antibody.

**Allergen** — When an antigen induces an allergic reaction, it's called an allergen. The threshold at which an allergic reaction occurs is different for every person.

**Dander** — Dander is minute scales from hair, feathers or skin. These scales may be allergenic.

Independent testing shows that Honeywell F300 Electronic Air Cleaners capture a very high percentage of mold spores, bacteria, dust mite antigen, cat dander and ragweed pollen from the air that passes through the filter. The Honeywell F300 Electronic Air Cleaner captured more than 90 percent of mold spores and ragweed pollen from the air passing through the air cleaner, more than 70 percent of bacteria and cat dander, and nearly 60 percent of dust mite antigen.

The testing found that the Honeywell F300 Electronic Air Cleaner is more efficient at capturing all five types of particles than a standard one-inch furnace filter (see chart).

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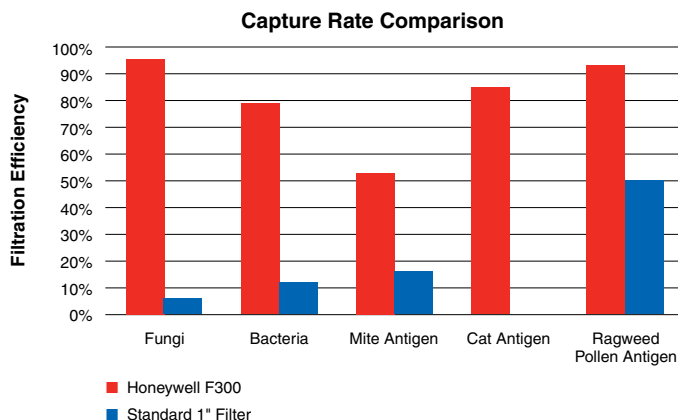
### Air cleaners and allergy relief

An air cleaner may provide some relief to individuals suffering from allergies or other respiratory problems and should be part of an overall allergy treatment program. However, there is no guarantee that a reduction in symptoms will occur through the use of any type of air cleaner.

### Tell your customers about this trial

Explain which allergens are captured with a Honeywell F300 Electronic Air Cleaner and you'll have your customers' full attention. Then show them the data documenting the trial results — and you'll have them buying.

And we're not done yet — stay tuned for more Honeywell research in this area.



## ELECTRONIC AIR CLEANER OUT-FILTERS THE COMPETITION

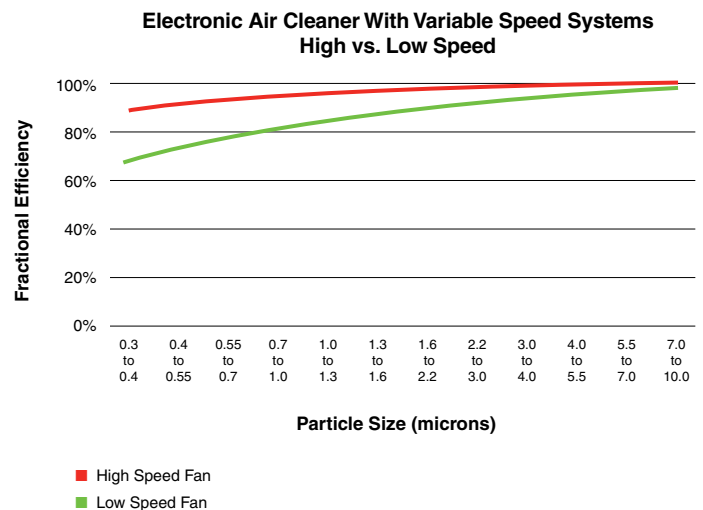
Honeywell F300 Electronic Air Cleaner consistently outperforms Trion and White-Rodgers in fractional efficiency testing.



### F300 Stands Alone

In side-by-side testing, the Honeywell F300 Electronic Air Cleaner outperformed both White-Rodgers and Trion models across all sizes of particles. The Honeywell F300 Electronic Air Cleaner captured up to 30 percent more particles at some particle sizes, clearly establishing the Honeywell product as the true industry leader in performance.

Remember, both Trion and White-Rodgers supply electronic air cleaners to equipment manufacturers, so this comparison is also valid against the OEM models as well.



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