

## **The History of PuraClean**

There is no other product on the market like Puraclean, and we did not start out to develop a product to improve indoor air quality. Rather, PuraClean was discovered somewhat by accident, during similar but related indirect research to support both the U.S. Army Medical Core and NASA.

Mainstream engineers and scientists were looking for a means to improve the air quality in future NASA spacecraft, and later we expanded this investigation to include potential methods to remove chemical warfare agents from the soldier's environment.

What we ended up with was a patent-pending liquid formulation which after application to an ordinary non-electrostatic filter (such as a metallic filter, disposable spun-glass filter, or foam filter) will produce a dielectric filter surface and hence, turn an ordinary filter into a passive electrostatic filter.

## **How Well Does it Work?**

It is well known that ordinary (and widely used), fiber-filters installed in heating or air conditioning systems only remove about 20% of the large dust particles, meaning 80% of these large contaminants pass directly through the filter. While a denser filter would improve filtration, the resulting increased pressure drop across the filter would restrict the airflow, which in turn causes a decrease in system efficiency and a decrease in air circulation.

It is also well known that these ordinary, coarse, fiber- filters are ineffective at removing smaller, respirable particles such as smoke particles and pollen, which are a major source of discomfort for people with respiratory conditions, such as asthma.

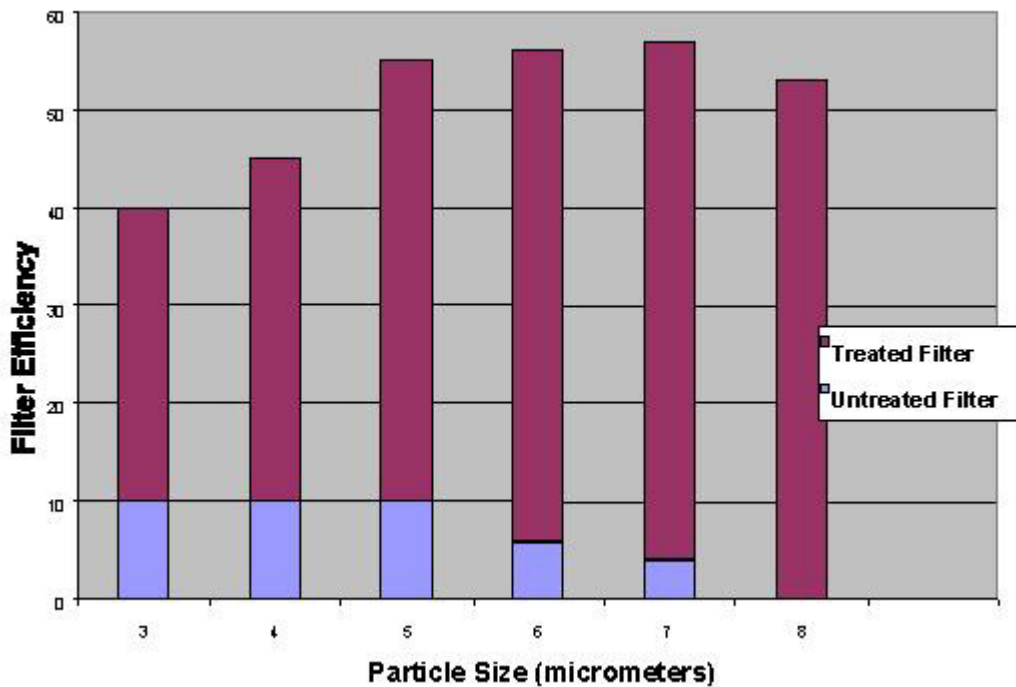
Most scientists would further agree that passive and active electrostatic filters improve the performance. However a more measurable means of determining the improvement in performance is needed. As a consumer you should be asking, how much better is one filter compared to the next, and how do these filters affect system air circulation and thus efficiency. The American Society of Heating Refrigerating and Air-conditioning Engineers, Inc., which is abbreviated as ASHRAE, is an engineering society that develops and continually updates tests standards for most aspects of heating and cooling equipment. When you read about the efficiency or measured performance of a certain air conditioner, furnace, or refrigerator, the test method to determine this performance was most likely developed by ASHRAE.

ASHRAE has a standard test method for determining the performance of air filters, referred to as ASHRAE 52.1 and titled "Gravimetric and Dust Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter". Among other things, this test method looks at the ability of the filter to capture contaminants, and the pressure drop, that is the resistance to airflow of the filter.

There are approved laboratories, throughout the United States that can perform this ASHRAE 52.1 test method on air filters. One such laboratory, Research Triangle Institute (RTI), located in Research Triangle Park, North Carolina, was contracted by Mainstream to perform the ASHARE 52.1 filter tests on ordinary course filters, treated with the PuraClean spray, and untreated. Their results were reported in RTI Report No. AX10080101, and summarized briefly below.

Figure 1 contains a bar graph of the measured filtration efficiency of the treated and untreated filter when exposed to 3 through 8-micrometer particles in the ASHRAE test performed by RTI. This bar graph has been created from data obtained from Figure 1 in RTI report No. AX10080101. It is significant to point out that the untreated filter has a zero filter efficiency at removing 8-micrometer particles and for all sizes. The PuraClean treated filter provided a substantial improvement in filtration efficiency, ranging from a 200% improvement in filtration efficiency when exposed to 3 micrometers particles, to more than a 1,200% improvement for 7 micrometer particle sized contaminates. Test results also indicated no significantly measurable difference in resistance to airflow.

**Figure 1. Filter Performance**



An admittedly less elegant scientific test, but one that can easily be performed by anyone, was also set up. We simply coated half of an ordinary inexpensive filter with the PuraClean spray, and left the other half untreated. We placed this filter in an air conditioning system and checked it after 30 days of use. Figure 2 displays the results of this test.

**Figure 2. In-Use Comparison of Untreated and Treated Sections**



***Untreated Section of Filter After 30 days of use***

**Treated Section of Filter After 30 days of use**

Clearly, whether a well-established performance test is executed by a certified outside testing laboratory, or a simple comparison test in an actual system is performed, the results support the same conclusion. Namely, PuraClean dramatically improves the performance of ordinary air filters.