Aprilaire 4000 Series Media Performance Data and Information

Media History

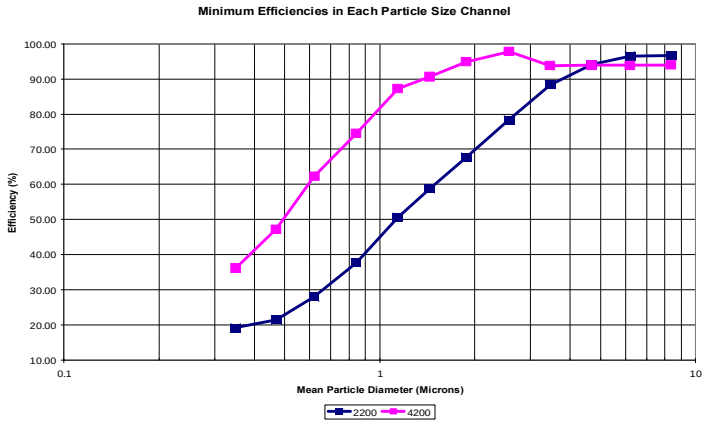
The micro glass fiber media used in the Aprilaire 2200/2400 media air cleaners was selected in the õ70s and at the time was the premium media available for media air cleaners. Air filtration media has evolved and improved over the last 30 years. When engineering started the development of the new air cleaner, we implemented an exhaustive search of many different media types. The search criteria focused on high filtering efficiency, low resistance, and long life. At the end of this search, the best choice was a charged synthetic media which has many improved characteristics over a glass fiber media.

Charged Synthetic Media

The Aprilaire 213 and 413 media is charged during the manufacturing process and is comprised of two different synthetic fibers. The charges transferred during the proprietary process are generally permanent because one of the fibers is a very good insulator. This also means that charged synthetic media can be stored and handled without loss of efficiency.

Efficiency Comparison – Charged Synthetic Media versus Micro Glass Fiber Media

Charged synthetic media performs differently than micro glass fiber media. The micro glass media removes particulate through mechanical means only and employs the filtration principles of straining, impingement, inertia impaction, and diffusion. The charged synthetic media employs all of these methods and additionally uses the charge in the media to attract the smallest particles down to 0.2 to 2.0 microns. This is similar to how our EAC works except we charge the media verses charging the particle with the EAC. It this charge that gives the product a dramatic improvement in efficiency at the smaller particle sizes. This is easy to see by looking at the efficiency comparison chart below.

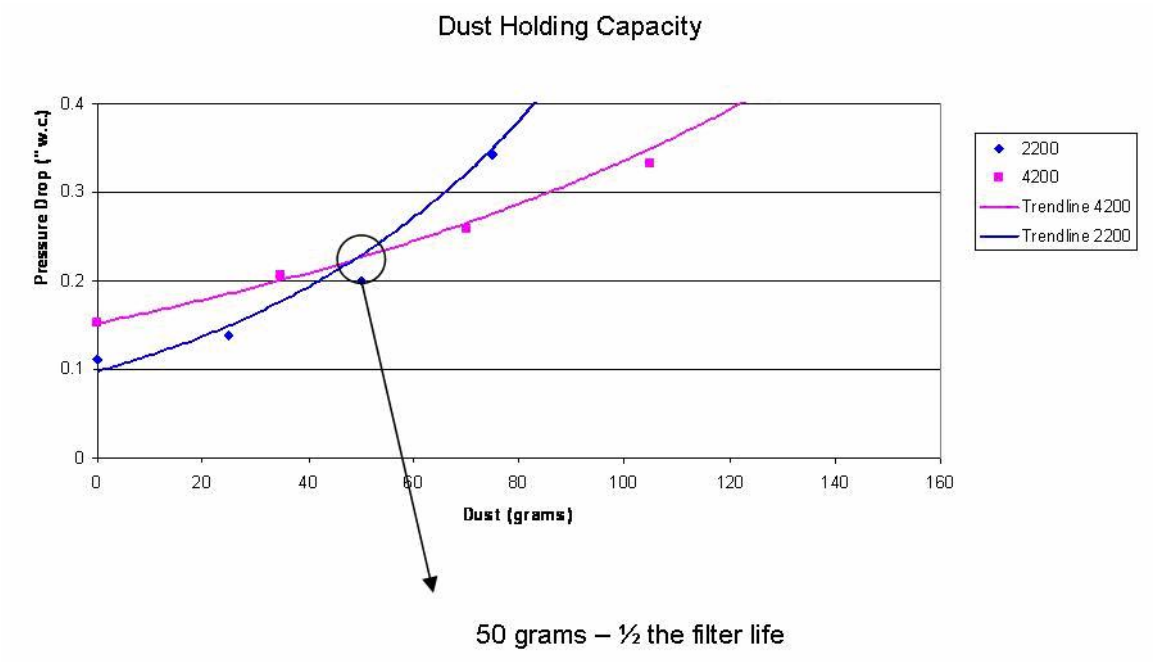


- The Aprilaire 4200 outperforms the Aprilaire 2200 by over 35% on one micron size particles.
- The Aprilaire 4200 performance in mid micron range (3-5 microns) is slightly below the 2200 because the charge has less effect on particles of this mass
- The Aprilaire 4200 performance in the larger micron range is similar to the 2200 because both rely on mechanical means of filtration

The Charged Synthetic Media is rated at MERV13 and performance does not measurably change over the life of the filter.

Resistance Comparison

Resistance is determined by how the media loads with particulate and has significant impact on the resistance of the filter over time. A filters ability to hold and retain particles is commonly known as depth loading. Technological advancements in filter construction have resulted in greater levels of smaller particles to travel deeper into the media before being trapped. This reduces the rate in which resistance increases, allows for less media to be used, and increases life expectancy of the filter. A charged synthetic media typically starts out with slightly higher resistance than micro glass fiber but the resistance increases more slowly because of its high capacity depth loading characteristics. This is depicted in the chart below.



When comparing the resistance to air flow of the Aprilaire 2200 and 4200, the initial pressure drop of the 2200 is lower however after six months (or 50 grams of dust) the pressure drop of the two products is equal. This is due to the depth loading characteristics of the 4200 media. Under normal conditions, 50 grams of dust is about half of the filter's life. The remaining life of the media of the 4200 has lower resistance than the 2200.

Application of the Aprilaire 4200 / 4400 – on 2000 CFM Systems

On 5 ton or 2000 cfm systems, we recommend that two air cleaners be installed on these systems. If the initial resistance is not of concern, we suggest that the media be replaced every 6 months instead of one year.