

## *What's in a Filter*

By: Ben Klawitter, Filtration Systems, Inc.

Most all of us are aware of MERV ratings on air filters and know that the higher the MERV smaller particles are filtered. But there are different types of medias that filters use to achieve these ratings, and knowing how a filter does that can impact how the filter performs once it begins to load.

There are two general classifications of media, coarse-charged and fine-fiber. Within these classifications there are numerous sub-types, but they follow the similar performance patterns. The main difference between these two media classifications is how they are manipulated to achieve their awarded MERV ratings.

Fine-fiber relies solely on how the fibers are arranged within the media to catch particles of various sizes. The higher the MERV the closer woven the media. All true HEPA filters, like you would find in the surgical suite of a hospital, are made with fine-fiber media. These filters are available in nearly all filter types *except* for ring-panels, links, and cubes.

Coarse-charged medias are larger in diameter than their non-synthetic counterparts which restricts the particle size that they can capture by using just the fibers themselves at MERV-5 or MERV-6. Filters that use synthetic media and have a higher MERV rating than that are manipulating the media with one of two methods: Electrostatic Charge or the application of Tackifier Oil.

Electrostatic charged air filters are usually pleated, bag, rigid box, or v-bed style air filters. A study was done in 2001 by the University of Minnesota that compared filters using electrostatically charged media and fine-fiber media. After a few weeks the Electrostatic filter lost 33% its filtering efficiency while the fine-fiber filter maintained its efficiency throughout the 19 week test.<sup>1</sup>

Tackifier is a sticky oil that will catch most anything that it touches. The difficulty with this method is that because it captures so much it loads very quickly and is known to be blown off of the filter media and then attach itself to the coils downstream of the filter. In testing done of some tackified filters there has also been shown substantially higher pressure drops, which means it takes significantly more energy to move air through the filter costing organizations that use them undue energy expenses. Once the oil is loaded then the MERV will drop because the filter is now relying only on the media itself. This method is commonly used on Polyester roll, ring panel, link, and cube style filters.

1-[http://www.jm.com/engineered\\_products/filtration/MinnesotaSummary.pdf](http://www.jm.com/engineered_products/filtration/MinnesotaSummary.pdf)



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