

## What Filter Rating Best Suits Your Building?

Last month in *Focus on Facilities, Facility Management* we discussed how pollen season could have an impact on air handling filters whether in one’s home, at work, and other building you spend time in on a regular basis. This month we are going to continue the discussion on air filters, their application, cost to maintain them, and the device to monitor the filter performance.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) discusses the removal of contaminants from both ventilation and recirculated air used for conditioning building interiors.

Many factors influence filter design and selection including (1) degree of cleanliness required, (2) specific particle size range or aerosols that require filtration, (3) aerosol concentration, (4) resistance to airflow through the filter, (5) design air face velocity to achieve published performance, (6) change-out cycle requirements, (7) energy consumption requirements, (8) special disposal mandates, and (9) resistance to certain conditions (physical, chemical, or biological). From these 9-categories, the facilities manager will be able to determine what type of filter they should purchase, the rating level of this filter and the replacement time line for using this filter.

Starting with “what type of filter they should purchase” we are posting the [MERV](#) (Minimum Efficiency Reporting Value) Rating Chart from last month’s column and noting that the suggested filter selection is based on the MERV rating that indicates the size of particles an air filter is designed to grab.



From left-to-right, the 5<sup>th</sup> column over is titled, “Typical Applications and Limitations” and this can help the reader select the MERV rated filter for their application. Also referencing the chart column 3 “Arrestance” is a measure of the ability of an air filtration device to remove dust from the air.

A facility manager could purchase a 1-inch thick MERV 1 through 3 filter to meet their facility air-handling unit needs but for a few dollars more this could be upgraded to a MERV 7 filter. If you were to search an on-line filter replacement web site e.g., [factorydirectfilters.com](#), you will find that several of these filter replacement manufacturers’ offer a MERV 13 rated filter that would be a further improvement over the MERV 1 through 7 shown on this chart. There are also electronic filters that use an electrostatic charge to enhance filtration of

particles such as dust, smoke, and pollen.

The MERV chart shows a wide range of filter ratings for various applications and these filters come in an assortment of filter module depth from 2 inches deep up to 24 inch deep and are constructed of different types of filter media including but not limited to flat filters, V-cell filters, and ridged filters.

For the facility manager an in-house facility person may be assigned filter replacements or this service work may be contracted out to a local HVAC company. The replacement schedule for these applications may be as simple as replacing the filters quarterly, but a much more effective method of filter replacement is to have magnehelic pressure gauges installed. These measure filter resistance sensing air pressure upstream and downstream of the filter unit. Manufacturers of this type of equipment produce gauges of the correct range to visually show the initial air resistance/pressure drop across the filter media. Meanwhile, the filter manufacturer will post their initial pressure drop across a specific type of filter and also note the recommended maximum pressure drop e.g., 0.25 inches of water across this same filter so that the maintenance person will know the proper time to replace the filter(s).

As the filters “load up” another term for the filters “getting dirty”, the magnehelic gauge will respond with its gauge needle moving to a higher-pressure drop. The maintenance person is recommended to place a marker on the gauge face e.g., 0.75 inches of water at the point when the filter is to be replaced. This quick visual check will help the maintenance person to anticipate when filters need to be changed.

While changing out filters on a predetermined basis e.g., quarterly, is an easy way to schedule the work, a replacement plan based on manufacturer’s recommended filter pressure drop reading on a magnehelic will assure the building owner that each filter is being used up to the point of

recommended manufacturer’s replacement condition.

Whatever way the building owner chooses to have the HVAC air-handling equipment filters changed, the most important reasons for changing filters are:

- Filters improve the quality of air the occupant breaths
- Filters contribute to a cleaner, healthier space environment by filtering the recirculated air, as well as the outdoor air being introduced to the HVAC unit
- Filters help to protect the HVAC equipment components e.g., dust collecting on a heating coil, etc.
- Filters help contribute to the supply air duct distribution remaining clean to make for a healthier space environment
- Filters save annual operating cost by maintaining cleaner heating and cooling service that, in turns improves energy efficiency of the equipment

Filters save owner operating cost by helping to reduce service maintenance potentially extending the equipment’s useful service life

In the end, a proactive filter replacement program is money well spent when compared to the costs and space environment when filter programs are compromised.

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