

## Energy Savings – HVAC

Written by: Ben Klawitter, Filtration Systems Inc.

“Heating, ventilating and air conditioning systems (HVAC) account for more than 40% of the total energy used in North America and 30% worldwide.”<sup>1</sup> Knowing that, there is a huge potential to save money and energy by altering your HVAC systems. Some things are more drastic, like installing variable frequency drives or VFD’s if none are present. Others are less costly and easier to do, like changing air filters. Most HVAC systems attribute 60% of their energy use to pulling air through its air filters.<sup>1</sup>

Because of this many air filter manufacturers have engineered different products to lower the energy necessary to pull air through their filter. In the late 90’s synthetic fibers were developed because of their ability to be manipulated into achieving higher MERV values while allowing less resistance to airflow.

ASHRAE became concerned by the use of synthetic fibers because they relied on “electrostatic charge” to achieve the higher MERV ratings. Europe’s council had developed a test in 2002 to determine an air filters efficiency in real-world applications and ASHRAE adopted that as the optional “Appendix J” test in their 52.2-2007 revision to testing an air filters MERV rating. What they discovered with this new test is that all filters utilizing charged synthetic fibers for their media will lose efficiency as their charge dissipates rapidly once in operation.<sup>2</sup> These same concerns have been raised about air filters that rely on tackifier.

Another inexpensive way to lower the energy use of an HVAC system is to monitor the change in static pressure, measured in inches of water column, across a bank of air filters. Most schools use some variant of a MERV-8 filter which have a manufacturer recommended final pressure of 1” water column. Letting a MERV-8 filter to get that high will result in a major amount of energy use in the last part of a filters life, and the industry recommended change is at twice the initial pressure, i.e. a filter starting at .4” should be changed at .8” This will maximize the balance of a lengthy filter life and the amount of energy used by the HVAC system to move air through the filter.

Magnehelic gauges are easily installed and require no connection to electricity, they run solely on the air moving through the filters to measure static pressure. They can be purchased from most air filter suppliers and HVAC or control-system vendors for between \$70 and \$120 depending on gauge brand and vendor.

<sup>1</sup>[www.filterair.info/literature/files/Energy & Filter Fact Handbook.pdf](http://www.filterair.info/literature/files/Energy%20&%20Filter%20Fact%20Handbook.pdf)

<sup>2</sup>[www.purolatorair.com/tech/downeed.pdf](http://www.purolatorair.com/tech/downeed.pdf)

