IMPROVING A HOME’S IAQ

Looking beyond high MERV filters

By Linda W Jungton and Rhett Major

High minimum efficiency reporting value (MERV) filters installed in air handlers with sufficient run-time can provide significant filtration benefits, removing fine particles from indoor air. However, this level of filtration may come with significant costs, both in fan and building energy costs and HVAC system performance.

The Pittsburgh-based Reducing Outdoor Contaminants in Indoor Spaces (ROCSS) initiative launched the Low Cost Monitoring Project in 2015 to determine whether these systems, used with a high MERV filter and other interventions, could reduce household particle levels and improve indoor air quality while cutting costs.

To date, more than 40 systems have been tested through the ROCSS Air Handler Inquiring (RAHI). The vast majority of the systems had existing problems, such as:

1. At installations, airflow had not been adjusted to field, and, as a result, the default airflow was too high for optimum heating and cooling. In addition, the system deflected to a high airflow in the run continuously.

2. Watt hour was widely variable and higher than expected for both permanent split capacitor (PSC) and electronically commutated motors (ECM).

3. More than 75% of the return ducts had Total External Static Pressure (TESP) much higher than the manufacturer’s recommendation, many had restrictions on the return air side. Clogged coils and high static across the filter were also common.

4. One-inch, high performance filters were very sensitive, particularly when dirty, and got dirty quickly (in less than one month).

At the points of HVAC system replacement, the return drop in MERV filters could be an appropriate addition to provide better energy and filter performance.

Four-inch filters seem to be much less likely to become clogged than one-inch pleated filters. In either case, providing feedback to alert occupants to change the filter could reduce HVAC system problems and improve performance.

Participants reported fewer respiratory symptoms, quieter HVAC system operation, and more.

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LINDA WJUNGTON is the team leader for the ROCSS initiative.

It aims to empower champions in housing, energy efficiency, environmental advocacy, education, sustainability, and health-related sectors. RHETT MAJOR has long been helping people in Pennsylvania save energy, provide a healthy living environment, and be more comfortable in their homes and businesses. Major works as a teacher, auditor, mentor, QCI, and training coordinator for Diagnostic Energy Auditors of Western PA. He also maintains a small diagnostic and inspection business.

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