Dust Holding Comments

C. Rose
2 March 08

ASHRAE 52.2 standardized test method is used primarily to measure three air filter performance characteristics - Airflow resistance, dust collecting efficiency, and dust holding capacity. Purpose is to aid the consumer in determining how one filter might compare with another and how they might apply in the actual operating conditions in an individual HVAC system.

Resistance is a function of airflow and can be directly compared with service conditions in HVAC system.

Efficiency is primarily a function of particle size and airflow. If one can describe those two factors in service, the results of the standardized test can be applied directly.

Dust holding capacity (measured in mass - grams) is a surrogate for filter life (measured in time - hours, days, months). It is a function of more things than one can count in a couple of paragraphs. Concentration, size, composition, airflow, percentage of time that system is operating, environmental conditions (eg RH) etc. are a few.

Pick one: “Natural” dust concentration. It varies by more than seven orders of magnitude in the earth’s atmosphere from about 500 µg/m3 in urban industrial environment to 10^{-5} µg/m^3 in Antarctica. It is obviously not possible for a controlled lab test with one set of conditions to give results directly applicable to service conditions over such a wide range as this one variable (and it is only one of many).

Without going into nuances and details, suffice it to say that at best it is a guide to use with other information available to the HVAC system operator.

However, that being said, it is critically important to have a *consensus* standardized test to measure the characteristic. It removes the inevitable self-serving bias that would occur in individually developed, non-consensus methods that would arise to fill the void left if the standard didn't include it. The chaos of infomercials is not preferable to the void. Is the method perfect? No. Is it good? You tell me. What I can tell you is that it’s the best we can provide, without bias. While it doesn’t give the whole answer, we hope it provides enough information to help reach a conclusion and answer a legitimate question.

Finally, it is a standard under continuous review and can be changed with sufficient consensus input. Anyone may initiate the process. Anyone may participate in the process. Including you.