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California Energy Commission  
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California Energy Commission

**DOCKETED**

**12-AAER-2E**

TN # 70682

MAY 08 2013

RE: Re: Docket No 12-AAER-2E (Air Filter Labeling)

Below you will find information from 3M company in response to the Energy Commission's Air Filter Labeling Invitation to Participate, **Docket # 12-AAER-2E**. Thank you for the opportunity to comment on this important topic.

3M has long been an advocate for the use of low resistance air filters, both for the purposes of maintaining HVAC system efficiency and for maintaining HVAC equipment performance. 3M has also long been an advocate of using residential HVAC filters to reduce indoor concentrations of airborne contaminants, such as allergens and fine particulate matter (PM<sub>2.5</sub>). While initially these two goals may seem contradictory, they illustrate the critical need for an appropriate balance of properties in HVAC filtration: maintaining a low resistance through the life of a filter while also providing meaningful particulate reduction for both fine and coarse particle.

**1. Product Definition**

Filtrete® filters – 1" and 4" residential air filters for homes with forced air.

**2. How many products in the market are currently labeled with MERV?**

Currently 3M Filtrete Filters are not labeled with MERV.

**3. What is the estimated cost to manufacturers to produce and affix a label? Does it differ by label location and format?**

It is estimated that to label all of our Filtrete products, there would be an estimated initial cost of \$2,000,000, including purchase of labels and/or printing plates, changes to manufacturing processes, and costs associated with existing packaging scrap.

**4. What are estimated costs to alter an existing label?**

It is estimated that 3M would spend approximately \$500,000 annually making these types of changes to an efficiency label.

**5. Are there technical or logistical barriers to labeling air filters?**

If actual labels are used on the product, these labels could slow down manufacturing efficiency and cause our packaging processes to change. If the label is incorporated into



our artwork, it will require that new print plates be made and artwork be scrapped every time the label information changes. Additionally, it would be virtually impossible to segregate product that will go to the state of California. 3M would need to label all Filtrete filters with this information, even if not sold in California.

**6. What are the current annual sales 2008-2013 and estimated Compound Annual Growth Rate (in CA and nationwide)**

3M does not disclose product sales information.

**7. What is an appropriate location of the label so that energy efficiency information is easily accessible to consumer?**

Either the front of the package or back of the package of individual filter units could reasonably convey this information. Manufacturers often use both package locations, either in printed bag or printed insert form, to communicate various performance claims and other use information about the filters.

**8. Other than the MERV is there other efficiency related information that could be on an air filter?**

Fine particulate contamination within the home has both indoor and outdoor origins. PM<sub>2.5</sub> is the one of the most widely studied and recognized measures of fine particulate concentration, and its mitigation may provide significant benefits to the welfare of sensitive groups. Many of the MERV levels as defined by the ASHRAE 52.2 standard, particularly those found in residential HVAC filtration, are determined either solely or largely by the large particle efficiency of a filter (E3, or the 3-10  $\mu\text{m}$  average particle-removal efficiency). The large particle efficiency may have very little relation to the fine particle removal efficiency of the filter, depending on the mechanisms used to capture the large particles. While larger particles will settle out of the air relatively quickly, fine particles remain suspended in the air for much greater periods of time and are more likely to be inhaled by building occupants.

Indoor particulate matter size distributions are believed to have been well-studied and reported in the literature. Accordingly, one could perform a weighted analysis of the fractional size efficiency measurements from the existing industry-standard ASHRAE 52.2 test, which could be readily used to report a predicted "PM<sub>2.5</sub> efficiency" for a filter. This approach would not require new test methods to be developed. In practice, this "PM<sub>2.5</sub> efficiency" may prove to be a weighted combination of the existing "E1" (0.3-1  $\mu\text{m}$ ) and "E2" (1-3  $\mu\text{m}$ ) averages from the ASHRAE 52.2 test.

It is widely recognized that significant lab to lab variation exists for ASHRAE 52.2 testing. Sources of variation include differences in particle counters, particle generators, humidity levels, operating procedures, airflow rates, etc. Additionally, manufacturers may employ different statistical and quality techniques for presenting the data. This lack of consistency in test procedures and results leads to significant variability in both



measured and reported MERV values, which makes comparison of manufacturer-reported MERV values problematic at best.

Several procedural items are critical to establishing credible and repeatable energy efficiency and filtration efficiency ratings:

- Testing should be performed at a single, defined flow rate
- Testing should be performed at a single test laboratory
- Ongoing verification of performance should be maintained
- Well-defined statistical procedures for determining claimed values should be established

#### **9. What are the benefits of affixing labels to products?**

It is important that a labeling program addresses the appropriate balance of HVAC filter properties which include maintaining a low resistance through the life of a filter while also providing meaningful particulate reduction for both fine and coarse particle. A well-defined and maintained labeling program such as this would allow consumers to make more educated purchasing decisions as it relates to the particle removal efficiency and energy efficiency impacts of HVAC filters. Additionally, a clearly defined program will allow manufacturers to compare products on a level playing field, which will allow more innovative products and technologies to stand out.

#### **10. How does the MERV and other factors of an air filter impact the performance of HVAC equipment?**

The most immediate filter-related impact on the performance of HVAC equipment is related to the initial resistance, or pressure drop, of the filter. A higher resistance filter reduces airflow and may negatively impact the heating or cooling efficiency; this is true of the majority of residential HVAC systems in use, which use PSC-type motors.

While in some situations a relationship exists between MERV and filter resistance, in many other cases one does not. In fact, a number of variables exist that provide the astute filter developer the ability to greatly vary filter efficiency while maintaining a nearly constant initial resistance. Such variables include variations in media design and pleat count.

Equally important, however, is the resistance of the filter through the life of the filter. Two filters with equal initial resistance may exhibit significantly different rates of resistance increase, or loading rates, in actual use. Several filter variables which can significantly influence loading rate include media density, fiber diameter, and the media surface area in the filter.

Additionally, some reports have shown that the lowest resistance filters, which accordingly have very low efficiency, may allow excessive particulate to pass through the filter and foul the heat exchanger coils. While such a filter may initially have a high

"energy efficiency," its long term use may lead to deterioration of the overall system efficiency.

**11. How many small businesses are involved in the manufacture, sale, or installation of these products?**

3M does not currently utilize small businesses in the manufacture, sale, or installation of Filtrete products.

If there are any questions about the above response, please contact us.

Sincerely,



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