State of California

Memorandum

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California Natural Resources Agency

To: Interested Parties

Date : May 14, 2012

Telephone: CALNET (916) 651-6182

From : **California Energy Commission -** **Jeff Miller**
1516 Ninth Street
Sacramento CA 95814-5512
High Performance Buildings & Standards Development Office

Subject: STAFF NOTES - RATIONALE FOR PROPOSED REQUIREMENT FOR AIR FILTER MEDIA LABELING - 2013 BUILDING ENERGY EFFICIENCY STANDARDS RULEMAKING

Background:

The 2008 Building Energy Efficiency Standards adopted ASHRAE 62.2-2007 by reference with the exception that window operation is not a permissible method for providing the whole-building airflow required by Section 4 of ASHRAE 62.2. Section 6.7 of ASHRAE Standard 62.2-2007 requires:

Minimum Filtration.
Mechanical systems that supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length and through a thermal conditioning component, except evaporative coolers, shall be provided with a filter having a designated minimum efficiency of MERV 6 or better when tested in accordance with *ANSI/ASHRAE Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.* The system shall be designed such that all recirculated and mechanically supplied outdoor air is filtered before passing through the thermal conditioning components. The filter shall be located and installed in such a manner as to facilitate access and regular service by the owner. The filter shall be selected and sized to operate at a clean pressure drop no greater than 0.1 in. w.c. (25 Pa) unless the equipment is designed or selected to accommodate any additional pressure drop imposed by the filter selection (i.e., greater than 0.1 in. w.c. [25 Pa]).

INTERPRETATION IC 62.2-2007-7 OF ANSI/ASHRAE STANDARD 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings Approved April 19, 2010) determined that:

- Air filter performance ratings determined using AHRI Standard 680-2009 can be utilized to demonstrate compliance with the MERV 6 requirement in ASHRAE Standard 62.2 Section 6.7.
- An air filter with a rated performance for particle size efficiency greater than or equal to 50% in the 3.0-10.0 µm range determined utilizing AHRI Standard 680 meets or exceeds the MERV 6 requirement in ASHRAE Standard 62.2-2007 Section 6.7.
- Air filter performance ratings determined using AHRI Standard 680-2009 can be utilized to demonstrate compliance with the maximum clean pressure drop requirements in ASHRAE Standard 62.2 Section 6.7.

When the 2008 Building Energy Efficiency Standards became effective, California HVAC system designers and system owners were not able to access the needed air filter media efficiency and pressure drop information needed to determine compliance with the ASHRAE 62.2 requirements because air filter MERV ratings and pressure drop information was not generally made available by the air filter media manufacturers.

The Energy Commission endeavored to access Air Filter manufacturer performance data in behalf of HVAC system designers and system owners to enable them to correctly select air filter media products for use in

residential HVAC systems that would comply with the requirements in ASHRAE 62.2-2007. (see attached - letter dated April 20, 2010 to Filter Product Manufacturers). There was limited response to the Commission's request for air filter media performance data from air filter manufacturers. Four (4) manufacturers of the thirteen (13) manufacturers identified responded.

2013 Rulemaking:

The 2013 Building Energy Efficiency Standards propose to adopt ASHRAE 62.2-2010. Sections 6.7 and 6.7.1 of ASHRAE Standard 62.2-2010 require:

6.7 Minimum Filtration.
Mechanical systems that supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length and through a thermal conditioning component, except evaporative coolers, shall be provided with a filter having a designated minimum efficiency of MERV 6 or better when tested in accordance with *ANSI/ASHRAE Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size* or a minimum Particle Size Efficiency of 50% in the 3.0–10 μm range in accordance with AHRI Standard 680, *Performance Rating of Residential Air Filter Equipment*. The system shall be designed such that all recirculated and mechanically supplied outdoor air is filtered before passing through the thermal conditioning components. The filter shall be located and installed in such a manner as to facilitate access and regular service by the owner.

6.7.1 Filter Pressure Drop.
New mechanical and distribution systems covered by Section 6.7, installed after January 1, 2014, shall be designed to accommodate the clean-filter pressure drop as rated using AHRI Standard 680, *Performance Rating of Residential Air Filter Equipment*, for the system design flow. The filter locations shall be labeled with the design airflow and maximum allowable clean-filter pressure drop. The label shall be visible to a person replacing the filter.

Proposed 2013 Building Energy Efficiency Standards Section 150.0(m)13 includes the requirement for air filter grille sizing and a maximum allowable clean filter pressure drop for the air filter media of 0.05 inches water column.

The Public Interest Energy Research (PIER) Program FINAL PROJECT REPORT - Efficiency Characteristics and Opportunities for New California Homes (ECO), MARCH 2011 CEC-500-2012-062, that supports several recommendations for the 2013 update to the 2013 Building Energy Efficiency Standards described the detrimental effects on HVAC system performance due to improper design of air filter devices and improper air filter media selection. The report recommends:

- Title 24–2013 should mandate labeling HVAC return locations with the size, maximum clean filter pressure drop at 400 CFM per ton clean filter airflow.
- Title 24–2013 should mandate that all HVAC filters sold in California be labeled with a standardized clean filter pressure drop and clean filter airflow table.

Rationale:

The requirement for air filter labeling as proposed for 2013 Standards Section 150.0(m)12D intends to ensure residential HVAC system designers and system owners are provided with the air filter media efficiency and pressure drop performance rating information needed to properly select air filter media products that will allow their HVAC systems to operate properly, and will make it possible for system designers and builders/owners to demonstrate compliance with the 2013 Standards.

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
v.energy.ca.gov

April 20, 2010

Attention: Filter product manufacturers

Subject: New filter requirements in California's Building Energy Standards

The 2008 Update to the California Building Energy Efficiency Standards (Title 24, Part 6) became effective on January 1, 2010. The update to the Residential Standards includes new mechanical ventilation requirements. The ASHRAE 62.2-2007 Residential Ventilation Standards for Indoor Air Quality are adopted by reference in the 2008 Title 24 Standards.

The California Energy Commission has been working with the home building design industry in California to facilitate compliance with these new mechanical ventilation requirements. The ASHRAE 62.2 Standard includes the requirement for thermal conditioning equipment to have air filters that meet a minimum MERV 6 efficiency, and the filters must be selected and sized to operate at a clean pressure drop no greater than 0.1 inches of water column (inch w.c.) unless the equipment is designed or selected to accommodate an additional pressure drop imposed by the filter selection greater than 0.1 inch w.c..

Air conditioning system designers need access to pressure drop and airflow rate data for these filters in order to size and specify HVAC systems that perform properly with these filters. Our understanding is that filter performance data describing resistance and airflow rate is not typically published with the MERV rating, thus this necessary information has not been made available to system designers.

The Energy Commission intends to establish a simple online database of air filter product information. We request your submission of this performance data for those filter products that you sell in California to enable the Energy Commission to post that information on the Energy Commission website for use by the public.

We intend to post performance data for MERV 6 through MERV 13 filter products rated at a face velocity of 295 feet per minute (fpm) as determined using the procedures in ASHRAE Standard 52.2-2007. The posted performance data will include the MERV rating number, the particle size efficiency (PSE) for the E_1 E_2 and E_3 ranges, and the clean filter pressure drop (inch w.c.) and airflow rate (cfm) at values of 50%, 75%, 100%, and 125% of the test airflow rate. Additionally, the airflow rate (cfm) at a pressure drop of 0.1 inch w.c., and the manufacturer's published specification for maximum airflow rate (cfm) with corresponding pressure drop (inch w.c.) will be reported.

Please provide all information shown in the attached spreadsheet for your California-market filter products to the Energy Commission.

Please submit your air filter performance information to the Energy Commission by June 01, 2010.

Please identify the name and contact information for the person in your organization who prepares your submittal so we can discuss the information as needed. Thank you in advance for your cooperation with the California Energy Commission.

If you have any questions, please contact me by e-mail at jmiller@energy.state.ca.us, or by telephone at (916) 651-6182.

Sincerely,

Jeff Miller, P.E.
Mechanical Engineer
High Performance Buildings and
Standards Development Office