

Air Filter Labeling

Codes and Standards Enhancement (CASE) Initiative
For PY 2013: Title 20 Standards Development

Response to CEC Staff Report for
Air Filter Labeling

California Energy Commission

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Prepared for:



PACIFIC GAS & ELECTRIC
COMPANY



SOUTHERN CALIFORNIA
EDISON



SAN DIEGO GAS AND
ELECTRIC



SOUTHERN CALIFORNIA
GAS COMPANY

Prepared by:

Jeff Steuben, ENERGY SOLUTIONS

Marshall Hunt, P.E., PACIFIC GAS & ELECTRIC COMPANY

Jay Madden, SOUTHERN CALIFORNIA EDISON

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1 Background

On July 29th, 2013, the California Investor Owned Utilities (Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), San Diego Gas & Electric (SDG&E)), herein referred to as the CA IOUs, submitted a Codes and Standards Enhancement (CASE) report for air filter labeling. On May 6th, 2014 the California Energy Commission (CEC) hosted a workshop to discuss its e staff report and solicit feedback from stakeholders. Below are the comments submitted on behalf of the CA IOUs in response to the CEC staff report and the proceedings of the workshop.

2 Response to CEC Staff Report

1. Proposed Label Design

The CEC's staff report proposes a filter label which discloses the filter efficiency in the MERV scale and the initial resistance in 400 cubic feet per minute (CFM) increments, as shown in Table Z, below. This proposed label closely matches the data reporting format of the AHRI 680 Test Method.

Table Z: CEC Proposed Label

MERV	Airflow Rate (CFM)	400	800	1200	1600	2000*	*Max Rated Airflow
[value]	Initial Resistance (IWC)	[value]	[value]	[value]	[value]	[value]	

The CA IOUs support the proposed label concept, as it represents a clear strategy to support Title 24 compliance requirements. An additional recommended component, filter size, is discussed below. Proposed marked up Title 20 language is included below as Appendix A.

2. Filter Size

At the May 6th workshop, CEC staff raised a question of whether or not the label should include the filter size. The CA IOUs support the inclusion of filter size in the label, specifically length and width in inches. Filter packaging typically includes this information, but the filter itself may not already be labeled with its dimensions. Adding the filter size to the required label will ensure that all the important information is in one consistent location. The area of the filter is necessary to allow system designers to convert the *airflow rate* to *face velocity*, which is used in meeting the design criteria in ACCA Manual T Air Distribution Basics¹.

¹ <http://www.acca.org/technical-manual/manual-t/>

3. Filter Efficiency Rating

Existing Title 24 language allows disclosing filter efficiency in either *MERV* or *particle size efficiency*, in percentages across three testing bins of different sized particles. The CA IOUs recommend that all filter efficiency should be reported in MERV. Allowing for different reporting options may complicate the labeling system and confuse consumers. In a 2012 product survey conducted by the IOUs, MERV ratings are the largest non-brand-specific efficiency metric used by air filter manufacturers, with one third of surveyed products using the metric. No surveyed products included particle size efficiency. Both ASHRAE Standard 52.2 and AHRI 680 generate the information necessary to develop a MERV rating. Thus the use of this single metric is the most applicable and does not create any additional testing burden. Appendix B is the ASHRAE Table for converting particle size efficiency measurements into a MERV rating.

4. Online Reporting and/or Labeling

At the May 6th workshop, a representative of AHRI submitted a comment positing that the physical label would pose additional cost burden to air filter manufacturers, and that filters would have to be specifically developed for the California market to meet the Title 20 labeling requirement. The commenter recommended eliminating the physical label and relying instead on online reporting to document the filter performance characteristics.

The CA IOUs strongly support the CEC's recommendation for physical labeling in addition to online reporting for the following reasons:

- The CEC staff report provided calculations outlining the cost-effectiveness of the labeling requirement.
- The CA IOUs do not feel that online reporting would be adequate to meet Title 24 requirements or the intent of this Title 20 measure. For consumers to take advantage of the information contained in the label, it must be readily available, and not require additional research before making purchase decisions.

APPENDIX A: Title 20 Proposed changes for Air Filter Labeling

Regulatory Language

Section 1601. Scope. (x) Air filters for use in forced-air heating or cooling equipment

Section 1602. Definitions. (x)

“Air filter equipment” means an air-cleaning device installed in forced-air heating or cooling equipment and used for removing particulate matter from the air.

“Air filter media” means the part of the air filter equipment that conducts the actual removal of particulates.

“Airflow rate” means the actual volume of test air passing through the device per unit of time, expressed in cubic-feet-per-minute, to three significant figures.

“Dust holding capacity” means the total amount of dust captured on the air filter equipment. Dust holding capacity shall be established at the maximum rated airflow rate, as published by the manufacturer.

“Final resistance” means the resistance of the air filter equipment operating at its maximum rated airflow rate at which the test is terminated and results determined.

“Forced air” means a HVAC system that uses air as its heat transfer medium.

“HVAC system” means a space-conditioning system or a ventilation system.

“Initial resistance” means the resistance of the air filter equipment operating at its rated airflow rate, as published by the manufacturer, with no dust load.

“Maximum rated airflow rate” means the highest airflow rate at which the air filter equipment is operated, as published by the manufacturer.

“Minimum efficiency reporting value (MERV)” means the composite particle efficiency metric defined in ASHRAE 52.2-2012.

“Particle size” means the polystyrene latex (PSL) light-scattering equivalent size of particulate matter as expressed as a diameter in micrometers (μm).

“Particle size efficiency” means the fraction (percentage) of particles that are captured on air filter equipment. Particle size efficiency is measured in three particle size ranges: 0.3-1.0, 1.0-3.0, 3.0-10 micrometers (μm) as determined according to ASHRAE Standard 52.2-2012 or AHRI 680-2009.

“Pressure drop” means the drop in HVAC system static pressure versus air flow rate across air filter media.

Section 1604. Test Methods for Specific Appliances.

(x) Air Filters.

The test methods for air filters are shown in Table X.

Table X: Air Filter Test Methods

Appliance	Appliance Performance Criteria	Test Method
Air Filters	Air Filter Pressure Drop	AHRI 680-2009
	Air Filter Particle Size Efficiency and MERV	AHRI 680-2009 or ASHRAE 52.2-2012
	Dust Holding Capacity	AHRI 680-2009 or ASHRAE 52.2-2012

Section 1607. Marking of Appliances.

(d) *Energy Performance Information.*

(14) **Air Filters.**

Each unit shall be marked, permanently and legibly, on an accessible and conspicuous place on the edge of the filter itself, in characters of font size 12, with the following information, as applicable to the air filter model: the MERV rating of the unit and initial resistance at 400 cfm, 800 cfm, 1200 cfm, 1600 cfm, and 2000 cfm or cfm ratings in 400 cfm increments up to the maximum rated airflow rate, as published by the manufacturer.

The information shall be disclosed in the format in Table Z.

Table Z:

MERV	Airflow Rate (CFM)	400	800	1200	1600	*2000	*Max Rated Airflow
[value]	Initial Resistance (IWC)	[value]	[value]	[value]	[value]	[value]	

APPENDIX B: Particle Size Efficiency and MERV Ratings²

Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency, % in Size Range, μm		
	Range 1 0.30–1.0	Range 2 1.0–3.0	Range 3 3.0–10.0
1	n/a	n/a	$E_3 < 20$
2	n/a	n/a	$E_3 < 20$
3	n/a	n/a	$E_3 < 20$
4	n/a	n/a	$E_3 < 20$
5	n/a	n/a	$20 \leq E_3 < 35$
6	n/a	n/a	$35 \leq E_3 < 50$
7	n/a	n/a	$50 \leq E_3 < 70$
8	n/a	n/a	$70 \leq E_3$
9	n/a	$E_2 < 50$	$85 \leq E_3$
10	n/a	$50 \leq E_2 < 65$	$85 \leq E_3$
11	n/a	$65 \leq E_2 < 80$	$85 \leq E_3$
12	n/a	$80 \leq E_2$	$90 \leq E_3$
13	$E_1 < 75$	$90 \leq E_2$	$90 \leq E_3$
14	$75 \leq E_1 < 85$	$90 \leq E_2$	$90 \leq E_3$
15	$85 \leq E_1 < 95$	$90 \leq E_2$	$90 \leq E_3$
16	$95 \leq E_1$	$95 \leq E_2$	$95 \leq E_3$

²ANSI/ASHRAE Standard 52.2-2012 Table 12-1, page 28