

## DOCKETED

<b>Docket Number:</b>	15-AAER-01
<b>Project Title:</b>	Appliance Efficiency Rulemaking for Toilets, Urinals, Faucets, HVAC Air Filters, Fluorescent Dimming Ballasts, and Heat Pump Water Chilling Packages
<b>TN #:</b>	208399
<b>Document Title:</b>	Supplemental Initial Statement of Reasons
<b>Description:</b>	Supplemental Initial Statement of Reasons for HVAC air filters, fluorescent dimming ballasts, and heat pump water chilling packages, and conforming changes related to federal updates to the Code of Federal Regulations.
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<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	1/21/2016 3:03:08 PM
<b>Docketed Date:</b>	1/21/2016

**SUPPLEMENTAL INITIAL  
STATEMENT OF REASONS  
(ISOR)  
PROPOSED AMENDMENTS  
TO APPLIANCE  
EFFICIENCY REGULATIONS**

**CALIFORNIA CODE OF REGULATIONS, TITLE 20:  
SECTIONS 1601-1609: APPLIANCE EFFICIENCY  
REGULATIONS**

**CALIFORNIA ENERGY COMMISSION**

**DOCKET NUMBER 15-AAER-01**

California Energy Commission  
Edmund G. Brown Jr., Governor



January 2016 | CEC-400-2015-004- ISOR



## SUPPLEMENTAL INITIAL STATEMENT OF REASONS

### PROPOSED AMENDMENTS TO APPLIANCE EFFICIENCY REGULATIONS

California Code of Regulations, Title 20,  
Sections 1601 through 1607

#### CALIFORNIA ENERGY COMMISSION

Docket Number 15-AAER-1

January 21, 2016

#### A. The Specific Purpose, Rationale, and Necessity of Each Section of the Proposed Amendments (Gov Code section 11346.2(b)(1) and section 11349(a))

This Supplemental Initial Statement of Reasons contains additional information in the “necessity” sections to support why specific regulatory language was added or deleted. The necessity sections also include more detail as to the sources of added language, such as citations to specific portions of the Staff Report. The format used is similar to that in the Initial Statement of Reasons. Regulatory language is shown followed by the Purpose, Rationale and Necessity for the change.

Text shown with single underline or ~~single strike-out~~ represents the original proposed language changes, (45-day text). Text shown with double underline or ~~double strike-out~~ represents proposed changes made after the original 45-day comment period that were part of the 15-day language. Finally, *italicized double underline* or ~~double strike-out~~ text represents non-substantive changes that have been made to the regulatory text since adoption by the Energy Commission. Because the changes are not substantive, an additional comment period on the regulatory language is not required. Non-substantive changes include adding more complete citations to the Code of Federal Regulations and correcting subsection numbering to fit within the existing numbering of title 20.

The Supplemental Initial Statement of Reasons removes information on toilets, faucets, and urinal standards that were presented in the original Initial Statement of Reasons, as these were adopted separately from the standards presented in this supplement and have already taken effect. This Supplemental initial statement of reasons also does not include most of the federal updates because a state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with Government Code section 11346.2(b). Therefore, no additional explanation for including federal updates is necessary.

The Supplemental Initial Statement of Reasons also contains additional documents relied upon which represent materials cited to and footnoted in the two Staff Reports.

## Section 1601. Scope.

(c) Central air conditioners, which are electrically-powered unitary air conditioners and electrically-powered unitary heat pumps, except those designed to operate without a fan; and gas-fired air conditioners and gas-fired heat pumps, air filters for residential buildings for use in forced-air heating or forced air cooling equipment, and heat pump water-chilling packages.

**Purpose and Rationale:** The scope of the regulations is being expanded to cover labeling of air filters and submission of data for Heat Pump Water-Chilling Packages. Air filters ensure the proper operation of heating, ventilation, and air-conditioning (HVAC) equipment by keeping internal components clean and free of particulates that build up and lower equipment efficiency by preventing the effective transfer of heat. The proposed air filter labeling measure is to empower consumers and HVAC designers with the information they need to make energy-efficient decisions. Heat pump water-chilling packages are being added for data collection to support possible inclusion of these packages into Title 24 building efficiency standards.

**Necessity:** Because the air filter labeling and heat pump water-chilling packages are new concepts in Title 20, including it in the scope is necessary to set parameters of the regulatory coverage.

The detailed technical and economic analysis supporting the need for regulations and for the necessity of the proposed language can be found at pages 9-23 and 44-45 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

(j) Fluorescent Lamp Ballasts and deep-dimming fluorescent lamp ballasts that are designed to:

**Purpose and Rationale:** The scope of the regulations is being expanded to cover deep-dimming fluorescent lamp ballasts. As set forth in C.F.R. §430.32 Energy and water conservation standards and their compliance dates and APPENDIX Q TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF FLUORESCENT LAMP BALLASTS, the federal standards only covers dimming ballasts designed to vary its output and that can achieve an output less than or equal to 50 percent of its maximum electrical output.

**Necessity:** Because deep-dimming fluorescent lamp ballasts are a new appliance in Title 20, including it in the scope is necessary to set parameters of the regulatory coverage.

Beginning in January 2014, new Title 24, Part 6 building regulations will drive increased adoption of dimming ballasts in new commercial installations in California. With the absence of state or federal appliance standards to regulate the efficiency of fluorescent ballasts to allow lamps to be dimmed below 50 percent full output, it is imperative that a standard be developed to ensure that dimming ballasts perform efficiently and that energy savings from Title 24 do not fall short of expectations. The term deep-dimming fluorescent lamp ballast is used to differentiate between ballasts that dim up to 50 percent and ballasts that can dim greater than 50 percent. This deep dimming is the focus of the regulations and are specifically defined in the definitions section. Therefore there is clear delineation

between the federally regulated dimming lamp ballasts and the state regulated deep-dimming lamp ballasts.

The detailed technical and economic analysis supporting the need for regulations and for the necessity of the proposed language can be found at pages 25-43 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

## Section 1602. Definitions.

### (b) Refrigerators, Refrigerators-Freezers, and Freezers

“Adjusted total volume” means the sum of (i) the fresh food compartment volume as defined in 10 C.F.R. part 430, Appendix A to Subpart B ~~or 10 C.F.R. part 430, Appendix A1 to Subpart B~~ in cubic feet, and (ii) the product of an adjustment factor and the net freezer compartment volume as defined in 10 C.F.R., part 430, Appendix A to Subpart B ~~or 10 C.F.R. part 430, Appendix A1 to Subpart B~~ in cubic feet.

**NOTE:** In the 15-day language this section incorrectly showed the second phrase, “or 10 C.F.R. part 430, Appendix A1 to Subpart B” in partial single strike out. The entire phrase should have been shown in double strike out. The correction is non-substantive as Appendix A1 has not been a permitted test procedure to determine compliance with energy conservation standards for refrigerators and refrigerator-freezers since September 15, 2014. (See Appendix A to Subpart B of Part 430)

### (c) Air Conditioners, Air Filters and Heat Pump Water-Chilling Packages.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The air filter definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-11 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The air filter media definition ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-11 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Air filter depth” means air filter thickness dimension measured perpendicular to the Face Area plane, expressed in inches.

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The air filter definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-11 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The airflow rate definition ensures clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-11, 18 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Dust holding capacity” means the total weight of the synthetic loading dust captured by the filter device over all of the incremental dust loading steps of the test. ~~amount of dust captured on the air filter. Dust holding capacity shall be established at the maximum rated airflow rate, as published by the manufacturer.~~

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-11, 23 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The term is used in the



ASHRAE 52.2 (2012) and AHRI 680 (2009) to measure the resistance to the flow. The information supporting the definition can be found in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Heat-pump water-chilling package” means a factory-made package of one or more compressors, condensers, and evaporators designed for the purpose of heating water. Where such equipment is provided in one or more than one assembly, the separate assemblies are designed to be used together. The package is specifically designed to make use of the refrigerant cycle to remove heat from an air or water source and to reject the heat to water for heating use. This unit may include valves to allow for reverse-cycle (cooling) operation.

**Purpose and Rationale:** The definition establishes what combination of products are considered heat-pump water chilling packages for purposes of these regulations.

**Necessity:** Because heat-pump water chilling packages are a new concept in Title 20 the definition is necessary to set the parameters of the product. The definition chosen is based on discussions with stakeholders and is standard industry accepted language describing the product class. The information supporting the definition can be found at pages 44-45 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The term is used in the ASHRAE 52.2 (2012) and AHRI 680 (2009) to measure the resistance to the flow. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The term is used in the

AHRI 680 (2009) to measure the resistance to the flow. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definition ensures clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. ASHRAE 52.2 is the industry standard for MERV, as distinguished from other manufacturer standards and matrix for particle efficiency. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Particle size” means the polystyrene latex (PSL) light-scattering equivalent size of particulate matter as expressed as a diameter in micrometers ( $\mu\text{m}$ ).

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Particle size efficiency” also known as “particle size removal efficiency” means the fraction (percentage) of particles that are captured on the air filter. Particle size efficiency is measured in three particle size ranges: 0.3-1.0, 1.0-3.0, 3.0-10 micrometers ( $\mu\text{m}$ ). Particle size efficiency ratings are abbreviated as “PSE~~R~~” in the required labels for air filters.

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. The

added language, “also known as particle size removal efficiency” was erroneously included in definition of “pressure drop” which it has now been deleted from that definition. As this was an obvious error and one that is not necessary for the definition, the correction is non-substantive.

“Pressure drop” ~~also known as “particle size removal efficiency”~~ means the drop in static pressure versus air flow rate across air filter media in the forced-air heating or cooling equipment.

**Purpose and Rationale:** This definition is being added to the regulations to support the new air filter labeling requirements.

**Necessity:** The new definitions ensure clarity within the regulations. The definition chosen is based on discussions with stakeholders and is standard industry accepted language. The information supporting the definition can be found at pages 9-12 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. The phrase “also known as particle size removal efficiency” was erroneously included this definition when it should have been added to the definition of “particle size efficiency”. As this was an obvious error and one that is not necessary for the definition, the correction is non-substantive.

#### **(j) Fluorescent Lamp Ballasts and Deep-Dimming Fluorescent Lamp Ballasts.**

“Arc power” means the entire output power of the ballast and delivered to all attached lamps.

**Purpose and Rationale:** The scope of the regulations is being expanded to cover certain types of dimming ballasts. In order to implement this coverage, new definitions are being added to ensure clarity as to the types of products covered and how efficiency is to be determined.

**Necessity:** New definitions are needed to implement efficiency standards for a new class of products. The definition chosen is based on discussions with stakeholders and is standard accepted language. The information supporting the definition can be found at page 25 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Deep-dimming fluorescent lamp ballast” means a fluorescent ballast that is capable of operating lamps in dimmed operating modes at any number of levels at or below 50 percent of full output. The term shall only apply to lamp ballasts designed to operate one, two, three, or four T5 or T8 four-foot linear or U~~+~~-shape fluorescent lamps.

**Purpose and Rationale:** The scope of the regulations is being expanded to cover certain types of dimming ballasts. In order to implement this coverage, new definitions are being added to ensure clarity as to the types of products covered and how efficiency is to be determined.

**Necessity:** New definitions are needed to implement efficiency standards for a new class of products. The definition chosen is based on discussions with stakeholders and is standard accepted language.

The information supporting the definition can be found at pages 26 and 28 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Input power” means the power provided to the ballast, typically line alternating-current power as determined by 10 C.F.R. section 2.5.1.6 of ~~amended~~ Appendix Q of Subpart B of Part 430.

**Purpose and Rationale:** The scope of the regulations is being expanded to cover certain types of dimming ballasts. In order to implement this coverage, new definitions are being added to ensure clarity as to the types of products covered and how efficiency is to be determined.

**Necessity:** New definitions are needed to implement efficiency standards for a new class of products. The definition chosen is based language from the 10 C.F.R. section 2.5.1.6 of Appendix Q of Subpart B of part 430 and on discussions with stakeholders and is standard accepted language. The information supporting the definition can be found at pages 25 and 29 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. There is no current “amended” Appendix Q in the C.F.R. therefore the removal of the term has no regulatory effect and the removal would not require additional 15-day public comment period.

“Maximum arc power” means the maximum amount of power a dimming ballast will provide to lamps under normal operating conditions. It is the same power as the measured power at 100 percent arc power.

**Purpose and Rationale:** The scope of the regulations is being expanded to cover certain types of dimming ballasts. In order to implement this coverage, new definitions are being added to ensure clarity as to the types of products covered and how efficiency is to be determined.

**Necessity:** New definitions are needed to implement efficiency standards for a new class of products. The definition chosen is based on discussions with stakeholders and is standard accepted language. The information supporting the definition can be found at page 32 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

“Weighted Ballast Luminous Efficacy” means the weighted average ballast luminous efficacy as calculated in section 1604(j)(3)(D)

**Purpose and Rationale:** The scope of the regulations is being expanded to cover certain types of dimming ballasts. In order to implement this coverage, new definitions are being added to ensure clarity as to the types of products covered and how efficiency is to be determined.

**Necessity:** New definitions are needed to implement efficiency standards for a new class of products. The definition chosen is based on discussions with stakeholders and is standard accepted language.

The information supporting the definition can be found at pages 28-29 of the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

Documents Incorporated by Reference:

ASTM Standard E 1084-86 (Reapproved 2009) Standard Test Method for Solar Transmittance (Terrestrial) of Sheet Materials Using Sunlight

Canadian Standards Association (CSA) CSA C390-10. Test methods, marking requirements, and energy efficiency levels for three-phase induction motors, March 2010

Institute of Electrical and Electronics Engineers (IEEE). Test Method B of IEEE Std 112-2004 Test Procedure for Polyphase Induction Motors and Generators, approved February 9, 2004

**Purpose and Rationale:** The additional documents reflect updates to the documents identified in federal regulations. See 10 C.F.R. 431.15 and 431.62.

**Necessity:** These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California's Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission's obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

## Section 1604. Test Methods for Specific Appliances

### (c) Central Air Conditioners, Air Filters, and Heat Pump Water-Chilling Packages.

(4) The test methods for air filters are shown in Table C-2

**Table C-2: Air Filter Test Methods**

<u>Appliance</u>	<u>Appliance Performance Criteria</u>	<u>Test Method</u>
<u>Air Filter</u>	<u>Air Filter Pressure Drop</u>	<u>AHRI 680-2009 or ASHRAE 52.2-2012</u>
	<u>Air Filter Particle Size Efficiency and Minimum Efficiency Reporting Value (MERV)</u>	<u>AHRI 680-2009 or ASHRAE 52.2-2012</u>
	<u>Air Filter Particle Size Efficiency</u>	<u>AHRI 680-2009 or ASHRAE 52.2-2012</u>
	<u>Dust Holding Capacity</u>	<u>AHRI 680-2009 or ASHRAE 52.2-2012</u>

Manufacturers shall test small, medium, and large size filters for each grade.

**Purpose and Rationale:** In order for a product to demonstrate compliance with efficiency standards a standardized test method must be identified. The proposed language sets forth the test method to be used in testing performance of a product.

**Necessity:** The proposed language is necessary for California’s building code, Title 24 Part 6 (2013), Section 150.0(m) 12, implementation of the air filter regulations. The selected test methods are consistent with Title 24, Part 6 California Code of Regulations. Two test methods are required because of the two different technologies used for air filters, mechanical filtration and electrostatic. Only one test method exists for MERV, as it was developed by ASHRAE. Detailed analysis discussing the technologies can be found at pages 9-14 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

(5) Heat-pump water-chilling packages shall be tested using ANSI/AHRI 550-590 (I-P) 2011. The heating capacity tests shall be conducted at ambient temperature of each 47°F and 17°F and a leaving water temperature of 120°F. If the package is capable of cooling, it shall be tested at an ambient temperature of 95°F and a leaving water temperature of 44°F.

**Purpose and Rationale:** In order for a heat pump water chilling package to demonstrate its energy usage a standardized test method must be identified. The proposed language sets forth the test method to be used in testing performance of a product.

**Necessity:** The proposed language is necessary for implementation of the proposed regulations and to obtain data which will help determine how heat pump water chilling packages can be utilized in the energy efficiency provisions of Title 24. Temperature parameters are required in the test procedure ANSI/AHRI.550-590 (I-P) 2011, and therefore identified in the regulatory language. The detailed technical and economic analysis supporting the need for regulations and for the necessity of the proposed language can be found at pages 44-45 in the Staff Report titled Singh, Harinder, Ken Rider,

Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

**(d) Spot Air Conditioners, Evaporative Coolers, Ceiling Fans, Ceiling Fan Light Kits, Whole House Fans, Residential Exhaust Fans, and Dehumidifiers.**

**Table D-1**  
**Spot Air Conditioner, Ceiling Fan, Ceiling Fan Light Kit, Evaporative Cooler, Whole House Fan, Residential Exhaust Fan, and Dehumidifier Test Methods**

<i>Appliance</i>	<i>Test Method</i>
Spot Air Conditioners	ANSI/ASHRAE 128-2001
Ceiling Fans, Except Low-Profile Ceiling Fans	10 C.F.R. section 430.23(w) (Appendix U to Subpart B of part 430)
Ceiling Fan Light Kits	10 C.F.R. section 430.23(x) (Appendix V to Subpart B of part 430)
Evaporative Coolers	ANSI/ASHRAE 133-2008 for packaged direct evaporative coolers and packaged indirect/direct evaporative coolers; ANSI/ASHRAE 143-2007 for packaged indirect evaporative coolers
Whole House Fans	HVI-916, tested with manufacturer-provided louvers in place (2009)
Dehumidifiers	10 C.F.R. section 430.23(z) (Appendix X to Subpart B of part 430, <u>active mode portion only</u> ) <del>OR 10 C.F.R. section 430.23(z) (Appendix X1 to Subpart B of part 430) (at manufacturer's discretion) for models manufactured before April 29, 2013</del> 10 C.F.R. section 430.23(z) (Appendix X1 to Subpart B of part 430) for models manufactured on or after April 29, 2013
Residential Exhaust Fans	HVI-916 (2009)
Residential Furnace Fans	10 C.F.R. section 430.23(cc) (Appendix AA to Subpart B of part 430)

**Purpose and Rationale:** These changes reflect the current federal test methods as found in 10 C.F.R. § 430.23(z) (dehumidifier) and (cc) furnace fans. In addition Appendix X1 is being removed because the data generated is not necessary for product certification.

**Necessity:** These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California's Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission's obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**(j) Fluorescent Lamp Ballasts and Deep-Dimming Fluorescent Lamp Ballasts.**

(3) Deep-dimming fluorescent lamp ballasts shall be tested using 10 C.F.R. Section 430.23(q) (Appendix Q to Subpart B of part 430) (referred to as the "federal test method" in the following subsections), modified as follows:

(A) The control signal to the ballast shall indicate full output. The arc power of all connected lamps shall be measured and then added together. This result will be referred to as "maximum arc power." An appropriate lighting control shall be selected to achieve the control signal used to determine the maximum arc power and to tune the ballast to the appropriate dimming levels. The controls shall be selected by using the following methodology:

(i) If the ballast manufacturer also manufactures a lighting control designed to be operated with the ballast, the test shall be conducted using the ballast manufacturer's lighting control. Or;

(ii) If the manufacturer does not manufacture a compatible lighting control, but recommends the use of specific manufacturer and/or model of lighting control, such as in its product documentation, the test shall be conducted using a lighting control from the list of manufacturer recommended lighting controls. Or;

(iii) If the manufacturer does not manufacture a compatible lighting control, and does not recommend any specific lighting controls, the lab technician shall select a lighting control that sufficiently controls the ballast to complete the test.

(iv) If multiple control options are available, use the lighting control that is capable of using all of the features of a ballast and with the minimum amount of other features. The lighting control manufacturer and model number shall appear on the test report.

**Purpose and Rationale:** In order for a product to demonstrate energy efficiency it must be tested using an identified test method. This section identifies the test method to be used so that deep-dimming ballasts can be tested and certified to the commission.

**Necessity:** The base test method selected is the existing federal test method for dimming fluorescent ballasts which is an industry standard test method. However, the federal test method only tests dimming levels less than 50%, whereas the Commission is regulating ballasts that dim greater than 50%. That test method must be modified to allow for the testing of ballasts dimmed at levels greater than 50%. The additional testing criteria were developed with industry stakeholders and are discussed on pages 28-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015. The test method allows for the use of any appropriate lighting control as identified in subsections (i)-(iv).

(B) Three sets of input power and arc power shall be measured using the federal test procedure with the total arc power tuned to 100, 80, and 50 percent of the measured maximum arc power. If a step



dimming ballast or a ballast that can only turn connected lamps on or off has dimming steps other than 80 and 50 percent, then the closest step that is between 90 and including 65 percent shall be used for 80 percent testing, and the closest step that is between 65 and including 35 percent shall be used for 50 percent testing. If no step exists in the above prescribed ranges, then no result shall be recorded for that percentage dimming test. The resulting input powers shall be recorded and referred to as  $P_{100}$ ,  $P_{80}$ , and  $P_{50}$ . The resulting arc powers shall be recorded and referred to as  $AP_{100}$ ,  $AP_{80}$ , and  $AP_{50}$ .  $BLE_{100}$  shall be calculated as  $AP_{100}/P_{100}$ ,  $BLE_{80}$  as  $AP_{80}/P_{80}$ , and  $BLE_{50}$  as  $AP_{50}/P_{50}$ . The measurement of power factor shall be taken during the measurement of maximum arc power and reported.

**Purpose and Rationale:** In order for a product to demonstrate energy efficiency it must be tested using an identified test method. This section identifies the test method to be used so that deep-dimming ballasts can be tested and certified to the commission.

**Necessity:** The test method selected is the existing federal test method for dimming fluorescent ballasts which is an industry standard test method. That test method must be modified to allow for the testing of ballasts dimmed at levels greater than 50%. The additional testing criteria were developed with industry stakeholders and are discussed on pages 28-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. Comment by Daniel Young on behalf of CA IOUs on 45 Day Language – Deep Dimming Ballasts also support “BLE” as a better symbol than P for representing ballast luminous efficacy.

(C) Standby mode test: the ballast shall also be tested with a control input set to the lowest dimming state possible up to and including no light output. The input power to the ballast shall be measured and recorded as  $P_0$ . The measurement must be taken 90 minutes after entering this state.  $P_0$  shall be recorded as the mean value of measurements taken at 5 second intervals over a 5-minute period.

**Purpose and Rationale:** In order for a product to demonstrate energy efficiency it must be tested using an identified test method. This section identifies the test method to be used so that deep-dimming ballasts can be tested and certified to the commission.

**Necessity:** The test method selected is the existing federal test method for dimming fluorescent ballasts which is an industry standard test method. That test method must be modified to allow for the testing of ballasts dimmed at levels greater than 50%. The additional testing criteria were developed with industry stakeholders and are discussed on pages 28-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

(D) The weighted ballast luminous efficacy shall be calculated using the following formula and table:  $Weighted\ ballast\ luminous\ efficacy = PBLE_{100} \times w_{100} + PBLE_{80} \times w_{80} + PBLE_{50} \times w_{50}$

Where ~~power is in watts and~~ the time values ( $w_{100}, w_{80}, w_{50}, w_0$ ) are taken from the appropriate tables below:

**Percentage Time of Operation Table**

Time Variable	Measurements taken			
	P <sub>80</sub> , P <sub>50</sub>	P <sub>80</sub> , no P <sub>50</sub>	No P <sub>80</sub> , P <sub>50</sub>	No P <sub>80</sub> , No P <sub>50</sub>
W <sub>100</sub>	<u>0.2</u>	<u>0.35</u>	<u>0.45</u>	<u>1</u>
W <sub>80</sub>	<u>0.5</u>	<u>0.65</u>	<u>0</u>	<u>0</u>
W <sub>50</sub>	<u>0.3</u>	<u>0</u>	<u>0.55</u>	<u>0</u>

**Purpose and Rationale:** In order for a product to demonstrate energy efficiency it must be tested using an identified test method. This section identifies the test method to be used so that deep-dimming ballasts can be tested and certified to the commission.

**Necessity:** The test method selected is the existing federal test method for dimming fluorescent ballasts which is an industry standard test method. That test method must be modified to allow for the testing of ballasts dimmed at levels greater than 50%. The additional testing criteria were developed with industry stakeholders and are discussed on pages 28-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. Comment by Daniel Young on behalf of CA IOUs on 45 Day Language – Deep Dimming Ballasts also support “BLE” as a better symbol than P for representing ballast luminous efficacy. The weighted BLE formula is a basic weighted average equation that assigns energy use by the dimming level.

The following documents are incorporated by reference in Section 1604.

**AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE (AHRI)**

AHRI 680-2009 2009 Standard for Performance Rating of Residential Air Filter Equipment

Copies available from: Air-Conditioning, Heating, and Refrigeration Institute (AHRI)  
2111 Wilson Blvd, Suite 500  
Arlington, VA 22201  
Phone: (703) 524-8800  
FAX: (703) 562-1942  
http://www.ahrinet.org/

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)**

ASHRAE 52.2-2012 Method of Testing General Ventilation Air-Cleaning

## Devices for Removal Efficiency by Particle Size

...

**Purpose and Rationale:** In order for a product to demonstrate compliance with efficiency standards a standardized test method must be identified. The proposed language sets forth the test method to be used in testing air filter performance.

**Necessity:** The proposed language is necessary for implementation of the air filter regulations. The selected test methods are consistent with Title 24, California Code of Regulations. Two test methods are industry standards and are required because of the two different technologies used for air filters, mechanical filtration and electrostatic. Detailed analysis discussing the technologies can be found at pages 9-14 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

## Section 1605.1 Federal and State Standards for Federally-Regulated Appliances

(c) (4) **Heat Pump Water Chilling Packages.** There is no energy efficiency standard or energy design standard for heat-pump, water-chilling packages

**Purpose and Rationale:** This provision clarifies that there are no current federal or state energy efficiency regulations related to heat pump water chilling packages.

**Necessity:** Since the regulations cover both federal and state regulated appliances, the language is necessary to provide notice that there are no federal standards covering the heat pump water chilling packages.

(e) **Gas and Oil Space Heaters and Electric Residential Boilers.**

Table E-6

### Standards for Gas- and Oil-Fired Central Furnaces Less Than 225,000 Btu/hour Input And Residential Electric Furnaces

<i>Appliance</i>	<i>Fuel</i>	<i>Type</i>	<i>Minimum AFUE</i>	<i>Effective Date</i>
Mobile Home Furnace	Gas, Oil	—	75	September 1, 1990
	Gas	Weatherized	80	January 1, 2015
		Non-Weatherized		May 1, 2013
	Oil	Weatherized	75	January 1, 2015
		Non-Weatherized		May 1, 2013
	Non Mobile Home Furnace	Gas, Oil	—	78
Gas		Weatherized	81	January 1, 2015
		Non-Weatherized	80	May 1, 2013
Oil		Weatherized	78	January 1, 2015

		Non-Weatherized	83	May 1, 2013
Residential Furnace	Electricity	Weatherized	78	January 1, 2015
		Non-Weatherized	78	May 1, 2013
Product class		AFUE (percent)	Compliance date	
<u>(A) Non-weatherized gas furnaces (not including mobile home furnaces)</u>		<u>80</u>	<u>November 19, 2015.</u>	
<u>(B) Mobile Home gas furnaces</u>		<u>80</u>	<u>November 19, 2015.</u>	
<u>(C) Non-weatherized oil-fired furnaces (not including mobile home furnaces)</u>		<u>83</u>	<u>May 1, 2013.</u>	
<u>(D) Mobile Home oil-fired furnaces</u>		<u>75</u>	<u>September 1, 1990.</u>	
<u>(E) Weatherized gas furnaces</u>		<u>81</u>	<u>January 1, 2015.</u>	
<u>(F) Weatherized oil-fired furnaces</u>		<u>78</u>	<u>January 1, 1992.</u>	
<u>(G) Electric furnaces</u>		<u>78</u>	<u>January 1, 1992.</u>	

**Purpose and Rationale:** These changes reflect the current federal definitions as found in 10 C.F.R. § 430.32(e)(1)(ii). (Note, the initial statement of reasons incorrectly cited to 431.32(e)(ii))

**Necessity:** These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

## **(j) Fluorescent Lamp Ballasts and Deep-Dimming Fluorescent Lamp Ballasts.**

**Purpose and Rationale:** Because there new state standards covering deep-dimming fluorescent ballast, the section header of 1605.1 is changed to conform to the new heading in other sections.

**Necessity:** This standard is necessary to ensure clarity and consistency with other sections of the regulations such as 1601 and 1602.

## **(k) Lamps.**

### **(2) Federally-Regulated Incandescent Reflector Lamps.**

2. The standards specified in Table K-3 shall not apply to the following types of incandescent reflector lamps:

- a. Lamps rated at 50 watts or less that are ER30, BR30, BR40, or ER40;
- b. Lamps rated at 65 watts that are BR30, BR40, or ER40 lamps; and
- c. R20 incandescent reflector lamps rated 45 watts or less;
- d. R20 short lamps.

**Purpose and Rationale:** 10 C.F.R. § 430.32(n)(7)(i)(B) identifies efficiency standards for certain types of lamps. The section also includes lamps which are not covered. While the federal standards do not include R20 short lamps in the list of exempted products, there are no standards for R20 lamps. In order to clarify to industry that R20 short lamps are not covered and that such lamps do not have to be certified to the Commission, R20 short lamps are being added to the list.

**Necessity:** This change will provide regulatory certainty with regard to what products are not covered and eliminate a area of confusion regarding the certification of R20 lamps

## **(n) Luminaires and Torchieres.**

~~(2) **Metal Halide Lamp Fixtures.** Metal halide lamp fixtures designed to be operated with lamps rated greater than or equal to 150 watts but less than or equal to 500 watts, manufactured on or after January 1, 2009, shall contain:~~

~~(A) A pulse-start metal halide ballast with a minimum ballast efficiency of 88 percent;~~

~~(B) A magnetic probe start ballast with a minimum ballast efficiency of 94 percent; or~~

~~(C) A nonpulse-start electronic ballast with either:~~

~~1. a minimum ballast efficiency of 92 percent for wattages greater than 250 watts; or~~

~~2. a minimum ballast efficiency of 90 percent for wattages less than or equal to 250 watts.~~

~~(D) This subsection does not apply to any metal halide lamp fixture:~~

- ~~1. with regulated lag ballasts;~~
- ~~2. that uses electronic ballasts that operate at 480 volts; or~~
- ~~3. that (i) are rated only for 150 watt lamps; (ii) are rated for use in wet locations, as specified by the National Electrical Code 2002, Section 410.4(A); and (iii) contain a ballast that is rated to operate at ambient air temperatures above 50°C., as specified by UL 1029-2001.~~

~~(3) — (2) Metal Halide Lamp Fixtures.~~

~~(A) See Section 1605.3(n) for energy efficiency standards and energy design standards for luminaires, including standards for metal halide luminaires sold or offered for sale in California that are manufactured:~~

- ~~(A) prior to January 1, 2009, or  
(B) on or after January 1, 2010.~~

(B) Each metal halide lamp fixture, designed to be operated with lamps less than 150 W and greater than 500 W, manufactured on or after February 10, 2017, must contain a metal halide ballast with an efficiency not less than the value determined from the appropriate equation in the following table:

**Table N-1**

<u>Designed to be operated with lamps of the following rated lamp wattage</u>	<u>Tested input voltage<del>††</del></u>	<u>Minimum standard equation<del>††</del> percent</u>
<u>≥50 W and ≤100 W</u>	<u>Tested at 480 V</u>	<u><math>(1/(1+1.24 \times P^{(-0.351)})) - 0.020<del>††</del></math></u>
<u>≥50 W and ≤100 W</u>	<u>All others</u>	<u><math>1/(1+1.24 \times P^{(-0.351)})</math></u>
<u>&gt;100 W and &lt;150<del>†</del> W</u>	<u>Tested at 480 V</u>	<u><math>(1/(1+1.24 \times P^{(-0.351)})) - 0.020</math></u>
<u>&gt;100 W and &lt;150<del>†</del> W</u>	<u>All others</u>	<u><math>1/(1+1.24 \times P^{(-0.351)})</math></u>
<u>&gt;500 W and ≤1000 W</u>	<u>Tested at 480 V</u>	<u>For &gt;500 W and ≤750 W: 0.900</u>
		<u>For &gt;750 W and ≤1000 W: <math>0.000104 \times P + 0.822</math></u>
		<u>For &gt;500 W and ≤1000 W: may not utilize a probe-start ballast</u>
<u>&gt;500 W and ≤1000 W</u>	<u>All others</u>	<u>For &gt;500 W and ≤750 W: 0.910</u>
		<u>For &gt;750 W and ≤1000 W: <math>0.000104 \times P + 0.832</math></u>
		<u>For &gt;500 W and ≤1000 W: may not utilize a probe-start ballast</u>

‡; Includes 150 W fixtures specified in 10 C.F.R. 431.326 paragraph (b)(3), that are fixtures rated only for 150 W lamps; rated for use in wet locations, as specified by the NFPA 70 (incorporated by reference, see §431.323), section 410.4(A); and containing a ballast that is rated to operate at ambient air temperatures above 50 °C, as specified by UL 1029 (incorporated by reference, see §431.323).

‡;Excludes 150 W fixtures specified in 10 C.F.R. 431.326 paragraph (b)(3), that are fixtures rated only for 150 W lamps; rated for use in wet locations, as specified by the NFPA 70, section 410.4(A); and containing a ballast that is rated to operate at ambient air temperatures above 50 °C, as specified by UL 1029.

‡‡; P is defined as the rated wattage of the lamp the fixture is designed to operate.

‡‡;Tested input voltage is specified in 10 C.F.R. 431.324.

(C) Except as provided in paragraph (D) of this section, metal halide lamp fixtures manufactured on or after February 10, 2017, that operate lamps with rated wattage >500 W to ≤1000 W must not contain a probe-start metal halide ballast.

(D) The standards described in paragraphs (B) and (C) of this section do not apply to—

(1) Metal halide lamp fixtures with regulated-lag ballasts;

(2) Metal halide lamp fixtures that use electronic ballasts that operate at 480 volts; and

(3) Metal halide lamp fixtures that use high-frequency electronic ballasts.

**Purpose and Rationale:** Metal Halide lamp fixtures (or luminaires) are covered by both federal and state standards. The language ensures the correct range of wattages covered by state and federal standards are properly articulated in the regulations and in the correct sections with cross references, (1605.1 and 1605.3). The federal language corresponds to 10 C.F.R. § 431.326.

**Necessity:** In order to ensure clarity as to the wattages covered by state and federal standards, language changes are necessary. The deleted language is being removed from the federal section of the regulations as these metal halide products are state regulated. The added language represents language from the 10 C.F.R. section 431.326 related to wattages under 150 watts and greater than 500 watts. Standards for lamps between 150 watts and 500 watts are covered by state standards under section 1605.3(n). In addition, standards for manufactured lamps after January 1, 2010 and before February 10, 2017 are covered by state standards section 1605.3 (n). These state standards are exempt from preemption under 42 U.S.C §§ 6295 (ii)(2) and 6297(c)(9) until federal standards for those products take effect. These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. Additional changes made to the text post adoption are not substantive and include correcting section numbering and lettering and references to subsections. Full citations to the C.F.R. were also added.



## Section 1605.3 State Standards for Non-Federally-Regulated Appliances.

### (c) Central Air Conditioners (e), Air Filters and Heat Pump Water-Chilling Packages

- (1) **Energy Efficiency Standards for Ground Water-Source Heat Pumps and Ground-Source Heat Pumps.** The EER and COP for ground water-source heat pumps and ground-source heat pumps manufactured on or after October 29, 2003, shall be not less than the applicable values shown in Table C-78.

Table C-78

#### Standards for Ground Water-Source and Ground-Source Heat Pumps

- (2) **Energy Efficiency Standards for Computer Room Air Conditioners.** The EER of evaporatively-cooled computer room air conditioners manufactured on or after the effective dates shown, shall be not less than the applicable values shown in Table C-89.

Table C-89

#### Standards for Evaporatively Cooled Computer Room Air Conditioners

**Purpose and Rationale:** These changes to existing table numbers are needed to maintain table numbering consistency due to the insertion of Table C-7 into Section 1605.1(c).

**Necessity:** Provides numbering consistency necessary for identifying the Table references.

(5) **Heat Pump Water Chilling Packages.** There is no energy efficiency standard or energy design standard for heat pump water-chilling packages. The performance of each model shall be reported per the requirements of section 1606 for equipment manufactured on or after ~~May~~ July 1, 2016.

**Purpose and Rationale:** This language explains that there are currently no efficiency or energy design standards covering heat pump water-chilling packages.

**Necessity:** Provides clarity as to the current status of heat pump water-chilling packages. The detailed technical and economic analysis supporting the need for regulations and for the necessity of the proposed language can be found on page 44-45 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. The date of July 2016 is a year out from the adoption of the regulations. Under Public Resources Code section 25402(c) the effective dates of the appliance regulations must be at least a year out from adoption to allow industry time to manufacture, test, and certify compliant products.

Note: In the ISOR one pages 27-28 Table C-7 titled: Standards for VARIABLE Refrigerant Flow Multi-Split Air Conditioners and Heat Pumps was incorrectly cited as 10 C.F.R. § 431.97 Table 8. The correct citation should be Table 11.

**(j) Fluorescent Lamp Ballasts and Deep-Dimming Fluorescent Lamp Ballasts.**

**(1) Deep-Dimming Fluorescent Lamp Ballasts.** Deep-dimming fluorescent lamp ballasts manufactured on or after ~~May~~ July 1, 2016 shall meet the following energy conservation standards:

- (i) Shall not consume more than 1 watt in standby mode;
- (ii) Shall have a power factor of 0.9 or greater; and
- (iii) Shall have a weighted ballast luminous efficacy greater than or equal to the threshold described in the following equation:

$$\textit{Weighted Ballast Luminous Efficacy} \geq \frac{AP_{100}^*}{AP_{100} \times 1.091 + 7.55}$$

\*AP<sub>100</sub> is shorthand for maximum arc power as defined in section 1602 and discussed in section 1604.

**Purpose and Rationale:** The language identifies the actual energy efficient standard that lamp ballasts must meet in order to be sold or offered for sale in California. (Note that in the 45-day language AP<sub>100</sub> was called P<sub>100</sub> but was changed to the more conventional shorthand. The A in the numerator and denominator, AP, should be double underlined but the graphic was not allowing this functionality.

**Necessity:** In order for the state to meet its energy efficiency goals and for the commission to meet its mandate under Public Resources Code section 25402 to reduce wasteful energy use in the state, the language is necessary. The specific regulatory language was developed through discussions with stakeholders. Detailed analysis of the standards is discussed on pages 28-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. The proposed efficiency standards will require lamp ballasts sold or offered for sale in the state to be more efficient than baseline ballasts, thereby saving energy.

The U.S. Department of Energy (DOE) has set efficiency standards for other types of fluorescent lamp ballasts, but due to special exemptions from preemption in 42 U.S.C. § 4297 (b) and (c) the Energy Commission is not preempted from setting efficiency standards for types of fluorescent ballasts that do not have federal standards. Ballasts that dim below 50 percent of full output are not included in the federal standards, (see 10 C.F.R. § 430.32 (m)(10) covering ballasts that dim to, but not more than, 50%). In addition, under Appendix Q to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Fluorescent Lamp Ballasts, *Dimming ballast* means a ballast that is designed to vary its output and that can achieve an output less than or equal to 50 percent of its maximum electrical output. The date change reflects a requirement in PRC section 25402(c)(1) that standards shall become effective no sooner than one year after the date of adoption.

(2) See Section 1605.1(j) for energy efficiency standards for fluorescent lamp ballasts that are federally regulated consumer products.

**Purpose and Rationale:** Fluorescent lamps ballasts are regulated under both federal and state standards. The language provides notice of this by directing readers to the federal section of the commission regulations.

**Necessity:** To ensure cross references, language that identifies the two sections covering dimming fluorescent lamp ballasts has been added.

## **(n) Luminaires and Torchieres.**

(1) Energy Efficiency Standard for Metal Halide Luminaires. Metal halide luminaires rated at least partially within the range of 150 to 500 watts shall not have probe-start ballasts and shall comply with Section 1605.3(n)(1)(A) as applicable:

(C) See section 1605.1(n) for energy efficiency standards for metal halide luminaires rated under 150 W and above 500 W.

**Purpose and Rationale:** This subsection is missing the “(1)” subsection number and needs to be corrected as there are following subsections numbers 2-5. The “(1)” was accurately reflected in the documentation submitted under Energy Commission Docket # 13-AAER-1 but was left out of the final publication. In addition, metal halide lamps are covered by both federal and state standards. The language ensures the correct range of wattages covered by state and federal standards are properly articulated in the regulations.

**Necessity:** In order to ensure clarity as to the wattages covered by state and federal standards, language changes are necessary. Federal standards related to wattages under 150 watts and greater than 500 watts are contained in 10 C.F.R. section 431.326. Standards for lamps between 150 watts and 500 watts are covered by state standards under section 1605.3(n). These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. See 42 U.S.C. §§ 6295 (ii)(2) and 6297(c) (9) for exemptions from preemption for Commission standards for metal halide lamp fixtures.

## Section 1606. Filing by Manufacturers; Listing of Appliances in Database.

Table X Data Submittal Requirements

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
	All Appliances	* Manufacturer's Name	
		* Brand Name	
		* Model Number	
		<u>Date model to be displayed</u>	
		Regulatory Status	Federally-regulated consumer product, federally-regulated commercial and industrial equipment, non-federally-regulated

\* "Identifier" information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

**Purpose and Rationale:** Purpose for this change is to receive information from the manufacturer as to when they want their product certification information displayed on the Commission's website. Some manufacturers want their information displayed on or after certain date. By requiring date model answer, on display information date, manufacturers cannot dispute with Commission why their information was or wasn't displayed on certain date. If the manufacturers don't provide any dates then staff automatically displays certification information after approval of their certification data.

**Necessity:** The change is necessary to reflect anticipated new functionality of the Commission's automated appliance certification database.

Table X Continued - Data Submittal Requirements

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
A	Self-contained Commercial Refrigerators with or without doors, Self-contained Commercial Refrigerator-Freezers with doors, Self-contained Commercial Freezers with or without doors, Self-contained Commercial Refrigerators specifically designed for display and sale of bottled or canned beverages without doors, Remote Condensing Commercial Refrigerators, Remote Condensing Commercial Freezers, Commercial Ice Cream Freezers  Certification of Self-contained Commercial Refrigerators without doors, Self-contained Commercial Freezers without doors, Remote Condensing Commercial Refrigerators, Remote Condensing Commercial Freezers, and Commercial Ice Cream Freezers, including all Energy	*Cabinet Style	Ice cream cabinet; milk or beverage cabinet; milk, beverage, or ice cream cabinet; undercounter cabinet; other reach-in cabinet; pass-through cabinet; roll-in or roll-through cabinet; preparation table; buffet table; wedge case; work top table; wine chiller
*Defrost System		Automatic, manual, partial-automatic	
*Type		Ice-cream application, low-temperature application, medium-temperature application, pull-down application	
*Door Style (for units manufactured before January 1, 2012 only) <u>Total Compartments (for hybrid models and refrigerator-freezers)</u>		<del>Solid hinged, solid sliding, transparent hinged, transparent sliding, none.</del>	
Equipment Family (for those units manufactured on or after January 1, 2012 only)		Vertical open, semivertical open, horizontal open, vertical closed transparent, horizontal closed transparent, vertical closed solid, horizontal closed solid, service over counter	
Condensing Unit Configuration (for those units manufactured on or after January 1, 2012 only)		Remote, self-contained	
Multiple compartments number (for those units manufactured on or after January 1, 2012 only)		Yes, no	
Total Display Area (TDA)			
Refrigerator Volume (for those units manufactured before January 1, 2012 only)			
Freezer Volume (for those units manufactured before January 1, 2012 only)			
Total Volume			
Height			
Width			

Consumption values except Daily Energy Consumption, is not required for models manufactured before January 1, 2012  (Note: units with multiple compartments must certify data for each compartment)	Depth	
	Anti-condensate Energy Consumption (AEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Condensate Evaporator Pan Energy Consumption (PEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Defrost Energy Consumption (DEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Fan Energy Consumption (FEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Compressor Energy Consumption (CEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Lighting Energy Consumption (LEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Other Energy Consumption (OEC) ( <u>for hybrid models and refrigerator-freezers</u> )	
	Daily Energy Consumption	
	Calculated Daily Energy Consumption (CDEC)	
	Total Daily Energy Consumption (TDEC)	
	Refrigerant Type	Ozone-depleting, non-ozone-depleting
	Insulation Type	Ozone-depleting, non-ozone-depleting

\* "Identifier" information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R. §431 subpart C. For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products to the commission.

**Necessity:** The specified data is necessary for certification to the commission. The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers

when certifying to the commission. Dates in this section were removed as they are no longer relevant, the date having passed.

Many of the proposed changes in this section relates to new federal standards for hybrid refrigerators and refrigerator freezers. These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California's Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission's obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued - Data Submittal Requirements**

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
B	Room Air Conditioners and Room Air-Conditioning Heat Pumps	*Voltage	
		*Electrical Phase	1, 3
		*Type	Room air conditioner, room air conditioning heat pump, casement-only room air conditioner, casement-slider room air conditioner.
		*Louvered Sides	Yes, no
		Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Energy Efficiency Ratio (EER) at 95°F	
		Combined Energy Efficiency Ratio at 95°F (required for models manufactured on or after June 1, 2014 only)	
		<u>Standby and Off Mode Annual Energy Consumption</u>	
		Heating Capability	Heat pump, electric resistance heating, heat pump and electric resistance heating, no heating capability
		<u>Heating Capacity (for heat pumps only)</u>	
		<u>Electrical Input (for heat pumps only)</u>	
		<u>Coefficient of Performance (for heat pumps only)</u>	
		<u>Heating Capacity (for models with electric resistance heating only)</u>	
		<u>Electrical Input (for those with electric resistance heating)</u>	
	Refrigerant Type <sup>1</sup>	Ozone-depleting, non-ozone-depleting	
	Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps	*Voltage	
		*Electrical Phase	1, 3
		*Type	PTAC, PTHP
		Size	Standard, non-standard
Cooling Capacity at 95°F			
Electrical Input at 95°F			
Energy Efficiency Ratio (EER) at 95°F			



	Heating Capability	Heat pump, electric resistance heating, heat pump and electric resistance heating, no heating capability
	Heating Capacity (for models with heating capability only)	
	Electrical Input (for models with heating capability only)	
	Coefficient of Performance (for models with heating capability only)	
	Refrigerant Type <sup>1</sup>	Ozone-depleting, non-ozone-depleting
	Indoor Fan Nominal Horsepower <sup>†</sup>	
	Indoor Fan Motor Type <sup>†</sup>	Premium, standard
	Outdoor Fan Nominal Horsepower <sup>†</sup>	
	Outdoor Fan Motor Type <sup>†</sup>	Premium, standard
	Compressor Power <sup>1</sup>	

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R. §431 subpart F (commercial packaged terminal air conditioners) and 10 C.F.R. Part 430, subpart B, Appendix F (room air conditioner). For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products to the commission.

**Necessity:** The specified data is necessary for certification to the commission. The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers when certifying to the commission. Dates were removed because those compliance dates have already passed and are no longer relevant to newly certified products.

These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission's obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X:  
Data Submittal Requirements**

	<b>Appliance</b>	<b>Required Information</b>	<b>Permissible Answers</b>
C	<u>Air Filters</u>	<u>Air filter sizes tested</u>	<u>Small, medium, and large</u>
		<u>Minimum Efficiency Reporting Value (MERV)</u>	<u>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 N/A</u>
		<u>Particle Size Efficiency for 0.3 to 1.0 µm particle size</u>	
		<u>Particle Size Efficiency for 1.0 to 3.0 µm particle size</u>	
		<u>Particle Size Efficiency for 3.0 to 10.0 µm particle size</u>	
		<u>Test Procedure used to determine air filter efficiency performance</u>	<u>AHRI 680-2009, or ASHRAE 52.2-2012</u>
		<u>Air Filter Length</u>	
		<u>Air Filter Width</u>	
		<u>Air Filter Depth</u>	
		<u>Air Filter Face Area</u>	
		<u>Face Velocity Utilized for the test procedure</u>	<u>N/A for AHRI 680 or V value in feet per minute for ASHRAE 52.2 or N/A</u>
		<u>Airflow Rate value 1</u>	
		<u>Airflow Rate value 2</u>	
		<u>Airflow Rate value 3</u>	
		<u>Airflow Rate value 4</u>	
		<u>Airflow Rate value 5-Maximum Rated Airflow Rate</u>	
		<u>Initial Resistance at <del>400 cubic feet per minute (cfm)</del> air flow rate value 1</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Initial Resistance at <del>800 cubic feet per minute (cfm)</del> air flow rate value 2</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Initial Resistance at <del>1,200 cubic feet per minute (cfm)</del> unless maximum rated airflow rate (as published by the manufacturer) is less than 1,200 cfm air flow rate value 3</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Initial Resistance at <del>1,600 cubic feet per minute (cfm)</del> unless maximum rated airflow rate (as published by the manufacturer) is less than 1,600 cfm air flow rate value 4</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Initial Resistance at <del>2,000 cubic feet per minute (cfm)</del> or the maximum rated airflow rate as published by the manufacturer air flow rate value 5</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Final Resistance at <del>2,000 cubic feet per minute (cfm)</del> or the maximum rated airflow rate as published by the manufacturer the point where test is terminated and results determined</u>	<u>Test results to one-hundredths of an Inch of Water Column</u>
		<u>Dust Holding Capacity at the maximum rated airflow rate as published by the manufacturer</u>	<u>Test results in multiples of one gram.</u>
		<u>Airflow Rate value determined at an Initial Resistance of 0.1 Inch of Water Column <del>Test Procedure used to determine air filter dust holding capacity</del></u>	<u><del>AHRI 680-2009, or ASHRAE 52.2-2012</del></u>

**Purpose and Rationale:** Table X has been updated to reflect the new air filter requirements. Table X contains data submittal requirements that allow the Commission staff to assess compliance with the required standards.

**Necessity:** Without data provisions, the Commission could not properly implement its appliance efficiency programs and ensure that all manufacturers are complying with efficiency requirements. In addition, some of the provided data is used to confirm the information included on the required product labeling required under section 1607. The categories of information reflect data generated during the testing process following the prescribe test method or data generated to show compliance with the energy efficiency standard. Discussion on the test method which generates the requested data can be found at pages 9-14 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

**Table X Continued - Data Submittal Requirements**

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
C	All Central Air Conditioners and Central Air-Conditioning Heat Pumps	*Coil Model Number with which Compressor was Tested (for split systems only)	
		*Type	Air conditioner, heat pump (heating and cooling), heat pump (heating only), heat pump (cooling only)
		*Energy Source for Cooling	Electricity, natural gas
		*Energy Source for Heating	Gas, oil, electric heat pump, electric resistance, heat pump and electric resistance, none
		*ARI Classification	
		*Voltage	
		*Electrical Phase	1, 3
		Variable Refrigerant Flow	Yes, no
		Heat Recovery (for Variable Refrigerant Flow models only)	Yes, no
		Vertical Air Conditioner (for single package models only) (required on or after January 1, 2010)	Yes, no
		Refrigerant Type <sup>1,2</sup>	Ozone-depleting, non-ozone-depleting
		Thermostatic Expansion Valve (for air-source or air-cooled models only)	Yes, no
		Thermostatic Expansion Valve (for air-source or air-cooled models only) <sup>1,2</sup>	Exception 1, Exception 2, Exception 3 [See Section 1605.2(c)(1)(B)], no exception
		Compressor Motor Design	Single-speed, dual-speed, multiple-speed, variable-speed
		Compressor Motor Horsepower <sup>1,2</sup>	
		Compressor Motor Type <sup>1,2</sup>	Premium, standard
		Outdoor Fan Motor Design <sup>1,2</sup>	Single-speed, dual-speed, multiple speed, variable speed
		Outdoor Fan Motor Nominal Horsepower <sup>1,2</sup>	
		Outdoor Fan Motor Type <sup>1,2</sup>	Premium, standard
Outdoor Fan Motor Power Factor (for models with variable speed motors only) <sup>1,2</sup>			

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
		Indoor Fan Motor Design <sup>1,2</sup>	<del>Single speed, dual speed, multiple speed, variable speed</del>
		Indoor Fan Motor Nominal Horsepower <sup>1,2</sup>	
		Indoor Fan Motor Type <sup>1,2</sup>	Premium, standard
		Indoor Fan Motor Power Factor (for variable speed motors only) <sup>1,2</sup>	

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R. Part 430, subpart B, Appendix M (central air conditioners). For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products to the commission.

**Necessity:** The specified data is no longer necessary for certification to the commission. The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers when certifying to the commission. The data in this section was voluntary only, and did not provide sufficient usefulness to the Commission to justify continuing to include it as part of the reporting requirements.

These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued - Data Submittal Requirements**

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
C	Air-Cooled, Single Package CAC < 65,000 Btu/hour and  Air-Cooled, Split System CAC < 65,000 Btu/hour	Seasonal Energy Efficiency Ratio (SEER) <sup>3</sup>	
		Cooling Capacity at 82°F <sup>3</sup>	
		Electrical Input at 82°F <sup>3</sup>	
		Degradation Coefficient at 82°F <sup>3</sup>	
		Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Energy Efficiency Ratio (EER) at 95°F	
		Average Off Mode Power Consumption (Watts) (for models manufactured on or after January 1, 2015 only)	
	Space-constrained Product	Space-constrained; <del>through the wall</del> <u>variable-speed mini-split</u> ; small duct, high velocity; not space-constrained	
	Air-Source, Single Package Heat Pumps < 65,000 Btu/hour and  Air-Source Split System Heat Pumps < 65,000 Btu/hour	Seasonal Energy Efficiency Ratio (SEER)	
		Cooling Capacity at 82°F <sup>3</sup>	
		Electrical Input at 82°F <sup>3</sup>	
		Degradation Coefficient at 82°F <sup>3</sup>	
		Cooling Capacity at 95°F	
Electrical Input at 95°F			
Energy Efficiency Ratio (EER) at 95°F			
<u>Average Off Mode Power Consumption (Watts)</u>			
Heating Seasonal Performance Factor (HSPF) <sup>3</sup>			
Heating Capacity			
Electrical Input			
Coefficient of Performance (COP) at 47°F (single package vertical heat pumps only)			
Space-constrained Product	Space-constrained; <del>through the wall</del> <u>variable-speed mini-split</u> ; small duct, high velocity; not space-constrained		
Air-Cooled, Single Package CAC ≥ 65,000 and < 760,000 Btu/hour  Air-Cooled, Split System CAC ≥ 65,000 and < 760,000 Btu/hour	Cooling Capacity at 95°F		
	Electrical Input at 95°F		
	Energy Efficiency Ratio (EER) at 95°F		
	Integrated Part Load Value (IPLV) If Applicable		
	Heating System Type <sup>1,2</sup>	Gas, oil, electric resistance, none	

\* "Identifier" information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

3 = Voluntary for single package vertical air conditioners and single package vertical heat pumps only.

**Table X Continued - Data Submittal Requirements**

	<b>Appliance</b>	<b>Required Information</b>	<b>Permissible Answers</b>
C	Air-Source, Single Package Heat Pumps ≥ 65,000 Btu/hour and < 760,000 Btu/hour; and  Air-Source, Split-System Heat Pumps ≥ 65,000 and < 760,000 Btu/hour	Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Energy Efficiency Ratio (EER) at 95°F	
		Integrated Part Load Value (IPLV) If Applicable	
		Heating Capacity at 47°F	
		Electrical Input at 47°F	
		Coefficient of Performance (COP) at 47°F	
		Heating Capacity at 17°F	
		Electrical Input at 17°F	
		Coefficient of Performance (COP) at 17°F	
	Evaporatively-Cooled Single Package CAC < 760,000 Btu/hour and  Evaporatively-Cooled Split System CAC < 760,000 Btu/hour	Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Energy Efficiency Ratio (EER) at 95°F	
		Integrated Part Load Value (IPLV) If Applicable	
		Heating System Type <sup>1, 2</sup>	Gas, oil, electric resistance, none
	Water-Cooled Single-Package CAC < 760,000 Btu/hour and  Water-Cooled, Split System CAC < 760,000 Btu/hour	Compressor Electrical Input (for models ≥ 65,000 Btu/hour only)	
		Indoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) <sup>3</sup>	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) <sup>3</sup>	
		Cooling Capacity at 85°F Entering Water Temperature	
		Electrical Input at 85°F Entering Water Temperature	
		Energy Efficiency Ratio (EER) at 85°F Entering Water Temperature	
		Low Temperature EER at 70°F Entering Water Temperature (for models < 65,000 Btu/hour only)	
		Heating System Type <sup>1</sup>	Gas, oil electric resistance, none
	Water-Source, Single Package Heat Pumps < 760,000 Btu/hour and  Water-Source Split System Heat Pumps < 760,000 Btu/hour	Compressor Electrical Input (for models ≥ 65,000 Btu/hour only)	
		Indoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) <sup>3</sup>	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) <sup>3</sup>	
		Cooling Capacity at 86°F Entering Water Temperature	



	Electrical Input at 86°F Entering Water Temperature	
	Energy Efficiency Ratio (EER) at 86°F Entering Water Temperature	
	Heating Capacity at 68°F Entering Water Temperature	
	Electrical Input at 68°F Entering Water Temperature	
	Coefficient of Performance (COP) at 68°F Entering Water Temperature	

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

3 = Report both fields for split systems; either indoor or outdoor fan electrical input (not both) for single package models.

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R.. For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products.

The addition of “variable –speed mini- split” conforms to U.S. Department of Energy –defined products (see 10 C.F.R> Part 430, subpart B, Appendix M) that is an allowable answer to “space constrained product.” Having all available technologies included as permissible answers ensures that those products can certify to the Commission.

These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued - Data Submittal Requirements**

	<b>Appliance</b>	<b>Required Information</b>	<b>Permissible Answers</b>
C	Ground Water-Source, Single Package Heat Pumps and	Compressor Electrical Input (for models $\geq 65,000$ Btu/hour only)	
		Indoor Fan Electrical Input (for models $\geq 65,000$ Btu/hour only) <sup>3</sup>	
	Ground Water-Source Split System Heat Pumps	Outdoor Fan Electrical Input (for models $\geq 65,000$ Btu/hour only) <sup>3</sup>	
		Cooling Capacity at 59°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
		Electrical Input at 59°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
		Energy Efficiency Ratio (EER) at 59°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
		Heating Capacity at 50°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
		Electrical Input at 50°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
		Coefficient of Performance (COP) at 50°F Entering Water Temperature (for all sizes, including but not limited to models $\geq 240,000$ Btu/hour)	
	Ground-Source, Closed-Loop, Single Package Heat Pumps and Ground-Source, Closed-Loop, Split System Heat Pumps	Compressor Electrical Input (for models $\geq 65,000$ Btu/hour only)	
		Indoor Fan Electrical Input (for models $\geq 65,000$ Btu/hour only) <sup>3</sup>	
		Outdoor Fan Electrical Input (for models $\geq 65,000$ Btu/hour only) <sup>3</sup>	
		Cooling Capacity at 77°F Entering Brine Temperature	

	Electrical Input at 77°F Entering Brine Temperature	
	Energy Efficiency Ratio (EER) at 77°F Entering Brine Temperature	
	Heating Capacity at 32°F Entering Brine Temperature	
	Electrical Input at 32°F Entering Brine Temperature	
	Coefficient of Performance (COP) at 32°F Entering Brine Temperature	

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances

3 = Report both fields for split systems; either indoor or outdoor fan electrical input (not both) for single package models.

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R. §431 subpart F. For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products to the commission.

**Necessity:** All ground water-source heat pumps and ground-source heat pumps (single packaged or split systems) are state-regulated. Water-source heat pumps (single packaged or split systems) are federally regulated. The test method for all three types is identical. By definition, all split system heat pumps are heat pumps in which all one or more of the major assemblies are separate from the others (typically with the condenser unit installed outside and the coil installed indoors – both equipped with their own electrical fan); all single-packaged heat pumps are heat pumps in which all the major assemblies are enclosed in one cabinet (therefore, it is physically impossible to have one part – either condenser or coil – installed in a location separate from the other part).

Split systems have both indoor electric fan and outdoor electric fan energy usage tested; single-packaged units only have one (either indoor or outdoor) tested, not both.

Manufacturers of both split systems and single-packaged units have requested that the Energy Commission clarify this requirement, specifically to provide regulatory assurances that we are not requiring both indoor and outdoor fan energy usage be reported for single package units which are not designed to have both an indoor and an outdoor component. The Energy Commission intends to receive electric fan usage data for both indoor and outdoor fans for split systems only. This requirement would apply to both for state and federally regulated products.

**Table X Continued - Data Submittal Requirements**

	Appliance	Required Information	Permissible Answers
C	Gas-Fired Air Conditioners and Gas-Fired Heat Pumps	Cooling Capacity – (cooling bin summary)	
		Gas Input While Cooling – (cooling bin summary)	
		Electric Input While Cooling – (cooling bin summary)	
		Cooling COP – Gas	
		Cooling COP – Electric	
		Heating Output – (heating bin summary)	
		Gas Input While Heating – (heating bin summary)	
		Electric Input While Heating – (heating bin summary)	
		Heating COP – Gas	
		Heating COP – Electric	
	Computer Room Air Conditioners	Equipment Type	Air-cooled, water-cooled, water-cooled with a fluid economizer, glycol-cooled, glycol-cooled with a fluid economizer, evaporatively cooled; <u>chilled-water-cooled</u>
		Net Sensible Cooling Capacity ( <u>air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only</u> )	
		Downflow Unit Power Input (watts) ( <u>air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only</u> )	
		Downflow Unit SCOP ( <u>air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only</u> )	
		Upflow Unit Power Input (watts) ( <u>air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only</u> )	
		Upflow Unit SCOP ( <u>air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only</u> )	

**Purpose and Rationale:** The changes clarify the types of computer room air conditioners that require the submission of data.

**Necessity:** 10 C.F.R. section 431.97 covers air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models of computer room air conditioners and but does not cover other types of cooling such as

evaporative cooled models. To ensure data is not submitted for cooling technologies not covered by federal or state standards, the specific technologies identified at 10 C.F.R. section 431.97 have been added to this section of Table X.

**Table X – Data Submittal Requirements**

	<i>Appliance</i>	<i>Required Information</i>	<i>Permissible Answers</i>
C	Heat pump water-chilling package	<u>Voltage*</u>	
		<u>Phase*</u>	<u>1, 3</u>
		<u>Refrigerant Type*</u>	<u>Ozone-depleting, non-ozone-depleting</u>
		<u>Compressor Motor Design*</u>	<u>Single-speed, dual-speed, multiple-speed, variable-speed</u>
		<u>OD Fan Motor Design*</u>	<u>Single-speed, dual-speed, multiple-speed, variable-speed</u>
		<u>Model number includes all components?</u>	<u>Yes, no</u>
		<u>Is the model designed for space cooling?</u>	<u>Yes, no</u>
		<u>Cooling Capacity (BTU per hour) if applicable</u>	
		<u>Cooling power input (watts) if applicable</u>	
		<u>Energy Efficiency Ratio (EER) if applicable</u>	
		<u>Integrated part load value (IPLV)</u>	
		<u>Heating Capacity (BTU per hour) at 47°F</u>	
		<u>Heating power input (watts) at 47°F</u>	
		<u>Coefficient of Performance (COP) at 47°F</u>	
		<u>Heating Capacity (BTU per hour) at 17°F</u>	
		<u>Heating power input (watts) at 17°F</u>	
		<u>Coefficient of Performance (COP) at 17°F</u>	
		<u>Heat Capacity (BTU per hour) of heat reclaim<sup>2</sup></u>	
<u>COPR of heat reclaim<sup>2</sup></u>			

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally regulated appliances

2 = Voluntary for state-regulated appliance

**Purpose and Rationale:** Table X has been updated to reflect the new heat pump water-chilling package requirements. Table X contains data submittal requirements that allow the Commission staff to assess compliance with the required standards.

**Necessity:** The data is necessary to allow for this type of product to potentially be used to meet title 24 building energy efficiency standards. Heat-pump water chilling packages are an innovative and efficient way to provide hot water heating, and/or cooling to a building. It is difficult to use this equipment to its full potential because of a lack of verifiable testing and performance data. Proposed regulations and data submissions would provide the testing and performance data necessary for product evaluation.

The categories of information reflect data generated during the testing process following the prescribe test method or data generated to show compliance with the energy efficiency standard. Discussion on the test method which generates the requested data can be found at pages 44-45 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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**Table X Continued - Data Submittal Requirements**

	Appliance	Required Information	Permissible Answers
D	Dehumidifiers		
		Product capacity (pints per day)	
		Energy Factor	
	<u>Residential Furnace Fans</u>	<u>Furnace Fan Type</u>	<u>Non-weatherized, non-condensing gas (NWG-NC); Non-weatherized, condensing gas (NWG-C); Weatherized non-condensing gas (WG-NC); Non-weatherized, non-condensing oil (NWO-NC); Non-weatherized electric furnace/modular blower fan (NWEF/NWMB); Mobile home non-weatherized, non-condensing gas (MH-NWG-NC); Mobile home non-weatherized, condensing gas (MH-NWG-C); Mobile home electric furnace/modular blower fan (MH-EF/MB); Mobile home non-weatherized oil (MG-NOW); Mobile home weatherized gas</u>
		<u>Wattage</u>	
		<u>Airflow at the maximum airflow-control setting (in cfm)</u>	
		<u>Fan Energy Rating (FER)</u>	

Purpose and Rationale: The changes reflect current federal data reporting requirements in 10 C.F.R. 430

Necessity: Appendix AA to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Furnace Fans contains the federal test method. The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers when certifying to the commission. In some cases additional information is requested on a voluntary basis for federally-regulated or state-regulated appliances. Those categories of data are marked with the footnote 1 or 2. The voluntary data helps in characterizing product features and are categories often suggested to be included by stakeholders.

These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued - Data Submittal Requirements**

	<b>Appliance</b>	<b>Required Information</b>	<b>Permissible Answers</b>
<b>G</b>	<b>Other Pool Heaters</b>	<b>Energy Source</b>	<b>Natural gas, LPG, oil, electric resistance</b>
		<del><b>Readily accessible on-off switch</b></del>	<del><b>Yes, no</b></del>
		<b>Constant Burning Pilot Light (for gas models)</b>	<b>Yes, no</b>
		<b>Input</b>	
		<b>Thermal Efficiency</b>	

Purpose and Rationale: These changes remove a field formerly required when these appliances were exclusively state - regulated. This is not part of the federal reporting requirements. The changes reflect current federal data reporting requirements at Title 10 Appendix P to Subpart B of Part 430— *Uniform Test Method for Measuring the Energy Consumption of Pool Heaters*.

Necessity: The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers when certifying to the commission.

These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued – Data Submittal Requirements**

	<b>Appliance</b>	<b>Required Information</b>	<b>Permissible Answers</b>
J	Fluorescent Lamp Ballasts	*Ballast Input Voltage	120, 277, <u>between 120 and 277</u> , other (specify)
		*Number of Lamps	
		*Type of <u>Fluorescent Lamp</u>	F34T12, F40T12, F96T12, F96T12/ES, F96T12HO, F96T12HO/ES, <del>other T12 (specify)</del> , T5, T8, <del>other (specify)</del> 2-foot U-shaped, 4-foot medium bipin, 4-foot miniature bipin high output, 4-foot miniature bipin standard output, 8-foot high output, 8-foot slim line
		<del>Designed for Dimming</del> <u>Product Class (from U.S. DOE CCMS product template)</u>	Continuous, stepped, no
		* <u>Building Application</u>	<del>Designed but not labeled for use only in residential buildings, designed and labeled for use only in residential buildings,</del> commercial, designed (not classified as <u>sign ballasts</u> ) to operate 8-foot high output lamps, designed and labeled as <u>sign ballasts to operate 8-foot high output lamps, residential; not classified as residential, other</u>
		* <u>Start</u>	Instant, <u>programmed</u> , rapid
		<u>Ballast Frequency</u>	High frequency, low frequency, other
		Designed for Dimming to 50% or Less of Maximum Output	<u>Yes, no</u>
		<u>Circuit Design</u>	Cathode cut-out, electronic, magnetic
		<u>Power Factor</u>	
		<del>Designed for Use in Ambient Temperatures of <math>\leq 0^{\circ}\text{F}</math></del> <u>Sign Ballast</u>	Yes, no
		Designed for Use (a) at Ambient Temperatures $\leq 20^{\circ}\text{F}$ and (b) in an Outdoor Sign (for models with two F96T12HO lamps only)	<u>Yes, no</u>
		<del>Replacement Ballast as Defined in Section 1602(j)</del>	<u>Yes, no</u>
		<del>Maximum Input Power Watts</del>	
		<del>Minimum Input Watts</del>	
<del>Average Total Lamp Arc Power</del>			
<del>Ballast Efficacy Factor</del> <u>Luminous Efficiency</u>			
<del>Relative Light Output</del>			



**Purpose and Rationale:** The changes reflect current federal data reporting requirements and data fields from the test method identified in 10 C.F.R. 430 Title 10 Appendix Q to Subpart B of Part 430—*Uniform Test Method for Measuring the Energy Consumption of Fluorescent Lamp Ballasts*.

**Necessity:** These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California’s Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission’s obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

**Table X Continued – Data Submittal Requirements**

Appliance	Required Information	Permissible
J Deep-Dimming Fluorescent Lamp Ballasts	*Ballast Input Voltage	120, 277, other (specify)
	*Number of Lamps	
	*Lamp type	T5, T8, other (specify)
	*Dimming Type	Continuous, stepped, individual lamp control, other (specify)
	*Control Type	3-wire, 0-10 volts, digital communication, phase, other (specify)
	*Start Type	Instant start, rapid start, program start, other (specify)
	P <sub>100</sub>	
	Arc Power 100	
	P <sub>80</sub>	(answer NA if not applicable)
	Arc Power 80	(answer NA if not applicable)
	P <sub>50</sub>	(answer NA if not applicable)
	Arc Power 50	(answer NA if not applicable)
	BLE 100	
	BLE 80	(answer NA if not applicable)
	BLE 50	(answer NA if not applicable)
	P <sub>0</sub> (standby mode power)	
	<del>Integrated</del> Weighted Ballast Luminous Efficacy	
Power Factor		

\* “Identifier” information as described in Section 1602(a).

1 = Voluntary for federally regulated appliances

2 = Voluntary for state-regulated appliances

**Purpose and Rationale:** Table X has been updated to reflect the new deep-dimming fluorescent ballast standards. Table X contains data submittal requirements that allow the Commission staff to assess compliance with the required standards.

**Necessity:** Without data provisions the Commission could not properly implement its appliance efficiency programs and ensure that all manufactures are complying with efficiency requirements. The categories of information reflect data generated during the testing process following the prescribe test method or data generated to show compliance with the energy efficiency standard. Discussion on the test method which generates the requested data can be found at pages 25-30 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

**Table X Continued - Data Submittal Requirements**

	Appliance	Required Information	Permissible Answers
Q	Clothes Dryers	*Energy Source	Gas, electric
		*Drum Capacity	
		*Voltage	120, 240, other (specify)
		Combination Washer/Dryer <sup>1</sup>	Yes, no
		<del>Automatic Termination Control</del> <sup>2</sup> <u>Venting</u>	<del>Yes, no</del> <u>Vented, ventless</u>
		<u>Energy Factor</u>	
		<u>Combined Energy Factor</u>	
		Constant Burning Pilot Light (Gas models only)	Yes, no

\* "Identifier" information as described in Section 1602(a).

1 = Voluntary for federally-regulated appliances

2 = Voluntary for state-regulated appliances.

**Purpose and Rationale:** These changes reflect the current federal data reporting requirements as found in 10 C.F.R. Part430, Subpart B, Appendix D. For federally regulated products, the reporting requirements are generally embedded within the efficiency standard or test method for a class of products as found in the C.F.R. The data is used to characterize and certify products to the commission. In the 45-day language the cells "Energy Factor" and "Combined Energy Factor" showed the phrases "(through December 31, 2014)" and "(required only on and after January 1, 2015)" both underlined and with strikeout. Because such designation is meaningless, simultaneously adding new language and removing it, the language was removed in this supplemental ISOR and will be removed from the regulatory language as a non-substantive change.

**Necessity:** The specified data is necessary for certification to the commission. The specific data fields comport with information generated as part of the standard product testing process and represents necessary data to allow commission staff to confirm energy efficiency claims made by manufacturers when certifying to the commission. These changes will provide regulatory certainty with respect to the accurate inclusion of federal regulatory language in California's Regulations. In addition under Government Code section 11346.2(c).

*A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed.*

Because a federally mandated regulation is being proposed, the Commission's obligation to provide a rationale for these changes as required under Government Code section 11346.2(b) is deemed met.

## Section 1607. Marking of Appliances

(d) Energy Performance Information.

(12)          Air Filters.

Each unit of air filters manufactured on or after ~~May~~ July 1, 2016 shall be marked, permanently and legibly, on an accessible and conspicuous place on the edge of the filter itself or on the pleats, in characters of font size 12, with the following information specified in either section (A) or (B) below, as applicable to the air filter model:

**Purpose and Rationale:** In order for the air filtering efficiency program to work consumers must be able to identify the correct replacement filter for the HVAC system installed in the building.

**Necessity:** After discussions with stakeholders and economic analysis, staff has determined that direct product labeling is the most effective way to inform consumers as to the correct replacement filter. A detailed discussion of labeling can be found at pages 10-18 in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007. The date change reflects a requirement in Public Resources Code section 25402(c)(1) that standards shall become effective no sooner than one year after the date of adoption. Note that the 15-day language incorrectly showed the 45-day language as June when it should have been May.

(A) Air filters for which the reported information is determined in accordance with the AHRI standard 680-2009 shall be marked with the following information:

1. The ~~MERV~~ Particle size efficiency (PSE) ratings of the unit and in three particle size ranges: 0.3-1.0, 1.0-3.0, 3.0-10 micrometers (µm).
2. Initial resistance at 400 cfm, 800 cfm, 1200 cfm, 1600 cfm, and either 2000 cfm or ~~maximum rated air flow~~, for the range of airflow rates as published by the manufacturer, including the maximum rated airflow rate. The selected airflow rates shall be in multiples of 400 cfm. If the maximum rated airflow rate is not a multiple of 400 cfm, then report initial resistance at multiples of 400 cfm, and any fraction thereof, to include the maximum rated airflow rate as described in subsections a, b, c, d, e below.
  - a. Airflow Rate Value 1 (val 1) = 400 cubic-feet-per-minute (cfm). If 400 cfm is not within the manufacturer's published range of airflow rates for the filter, value = N/A.
  - b. Airflow Rate Value 2 (val 2) = 800 cubic-feet-per-minute (cfm). If 800 cfm is not within the manufacturer's published range of airflow rates for the filter, value = N/A.

- c. Airflow Rate Value 3 (val 3) = 1200 cubic-feet-per-minute (cfm). If 1200 cfm is not within the manufacturer's published range of airflow rates for the filter, value = N/A.
  - d. Airflow Rate Value 4 (val 4) = 1600 cubic-feet-per-minute (cfm). If 1600 cfm is not within the manufacturer's published range of airflow rates for the filter, value = N/A
  - e. Airflow Rate Value 5 (val 5) = Maximum Rated Airflow Rate (cfm)
3. ~~The particle size efficiency rating used for this label shall be the particle size efficiency of 3.0 to 10.0 micron particles. Manufacturers may include both the MERV and particle size efficiency rating. If either MERV or particle size efficiency ratings have not been reported, in~~ Mark the non-reported MERV information field as "N/A."

(B) Air filters for which reported information is determined in accordance with ASHRAE Standard 52.2-2012 shall be marked with the following information:

- 1. Particle size efficiency (PSE) of the unit in three particle size ranges: 0.3-1.0, 1.0-3.0, 3.0-10 micrometers (µm).
- 2. Initial resistance for the range of airflow rates as published by the manufacturer, including the maximum rated airflow rate. The airflow rate values shall be the maximum rated airflow rate, and the values for 50%, 75%, 100% and 125% of the test airflow rate value determined in accordance with ASHRAE 52.2-2012. as described in subsections a, b, c, d, e below.
  - a. Airflow Rate Value 1 (val 1) = 50% of the test airflow rate in cubic-feet-per-minute (50% of airflow rate value 3).
  - b. Airflow Rate Value 2 (val 2) = 75% of the test airflow rate in cubic-feet-per-minute (75% of airflow rate value 3).
  - c. Airflow Rate Value 3 (val 3) = 100% test airflow rate in cubic-feet-per-minute; determined as equal to selected test face velocity (feet per minute) multiplied by the air filter face area (square feet).
  - d. Airflow Rate Value 4 (val 4) = 125% of the test airflow rate in cubic-feet-per-minute (125% of airflow rate value 3)
  - e. Airflow Rate Value 5 (val 5) = Maximum Rated Airflow Rate (cfm)
- 3. Minimum Efficiency Reporting Value (MERV).

**Purpose and Rationale:** In order for the air filtering efficiency program to work consumers must be able to identify the correct replacement filter for the HVAC system installed in the building.

**Necessity:** After discussions with stakeholders and economic analysis, staff has determined that direct product labeling is the most effective way to inform consumers as to the correct replacement filter. Two different labeling schemes are necessary to accommodate the two industry standards, either of which may be used by consumers to correctly match their air filter to their HVAC system. A detailed discussion of labeling can be found at pages 10-18 and A-1 through A-3, in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

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

**Table Z  
Sample Air Filter Marking**

<u>MERV</u>	<u>PSER (um)</u>	<u>Airflow Rate (CFM)</u>	<u>400</u>	<u>800</u>	<u>1200</u>	<u>1600</u>	<u>2000*</u>	<u>*Max Rated Airflow</u>
[value]	[value]	<u>Initial Resistance (IWC)</u>	[value]	[value]	[value]	[value]	[value]	

<u>MERV</u>	<u>(um) PSE</u>	<u>0.30-1.0</u>	<u>1.0-3.0</u>	<u>3.0-10</u>	<u>Airflow Rate (CFM)</u>	<u>[val 1]</u>	<u>[val 2]</u>	<u>[val 3]</u>	<u>[val 4]</u>	<u>[val 5]</u>	<u>*Max Rated Airflow</u>
[value]	<u>(%)</u>	[value]	[value]	[value]	<u>Initial Resistance (IWC)</u>	[value]	[value]	[value]	[value]	[value]	

If the marking on the air filter is not legible through its retail packaging, then the packaging shall also be labeled with the same information and in the same format as Table Z. The requirements of this section shall not preclude manufacturers from providing additional information.

**Purpose and Rationale:** In order for the air filtering efficiency program to work consumers must be able to identify the correct replacement filter for the HVAC system installed in the building.

**Necessity:** After discussions with stakeholders and economic analysis, staff has determined that direct product labeling is the most effective way to inform consumers as to the correct replacement filter. A detailed discussion of labeling can be found at pages 10-18 and A-1 through A-3, in the Staff Report titled Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*, California Energy Commission. Publication Number: CEC-400-2015-007.

## **D. Technical, Theoretical, and Empirical Studies, Reports, and Similar Documents Relied Upon (Gov Code 11346.2(B)(3))**

### **Dimming Fluorescent Ballasts, Air Filters and Heat Pump Water Chilling Packages**

Following the list of the documents relied upon in the Energy Commission's rulemaking for dimming fluorescent ballast, air filters, and heat pump water chilling packages. All of these documents were available at the time the 15 day language was published by reference to a link in the Notice document. They are each identified here in case there was any confusion about the intended documents.

Singh, Harinder, Ken Rider, Jared Babula. February 2015. *Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages*. California Energy Commission. Publication Number: CEC-400-2015-007.

CASE Report *Dimming Fluorescent Ballasts Codes and Standards Enhancement Initiative*, (August 5, 2013) Nate Dewart, Energy Solutions, 2015. Deep Dimming Ballasts-Response to 15 day Language. [http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-01/TN204548\\_20150508T150643\\_Nate\\_Dewart\\_Energy\\_Solutions\\_on\\_behalf\\_of\\_California\\_IOUs\\_Comme.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-01/TN204548_20150508T150643_Nate_Dewart_Energy_Solutions_on_behalf_of_California_IOUs_Comme.pdf)

Nate Dewart, Energy Solutions, 2015. Air Filter Labeling -Response to 15 day Language. [http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-01/TN204549\\_20150508T150808\\_Nate\\_Dewart\\_Energy\\_Solutions\\_on\\_behalf\\_of\\_California\\_IOUs\\_Comme.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-01/TN204549_20150508T150808_Nate_Dewart_Energy_Solutions_on_behalf_of_California_IOUs_Comme.pdf)

Dimming Ballasts, Comments regarding draft regulations, 2014. [http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/comments/14-AAER-01\\_CA\\_IOUs\\_Response\\_to\\_Draft\\_Regulations\\_Dimming\\_Ballasts\\_Finalv2\\_2014-06-06\\_TN-73146.pdf](http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/comments/14-AAER-01_CA_IOUs_Response_to_Draft_Regulations_Dimming_Ballasts_Finalv2_2014-06-06_TN-73146.pdf)

Air Filter Labeling, Response to CEC Staff Report for Air Filter Labeling, 2014. [http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/comments/14-AAER-01\\_CA\\_IOUs\\_Air\\_Filter\\_Labeling\\_2014-06-06\\_TN-73144.pdf](http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/comments/14-AAER-01_CA_IOUs_Air_Filter_Labeling_2014-06-06_TN-73144.pdf)

Dimming Ballasts. Additional Test Data and Comments Regarding CEC Staff Report for Dimming Ballasts, 2014. [http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/documents/2014-09-29\\_workshop/comments/California\\_IOUs\\_Response\\_to\\_Drat\\_Regualtions\\_RE\\_Dimming\\_Ballasts\\_2014-10-27\\_TN-73896.pdf](http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/documents/2014-09-29_workshop/comments/California_IOUs_Response_to_Drat_Regualtions_RE_Dimming_Ballasts_2014-10-27_TN-73896.pdf)

Harinder Singh, Ken Rider, and Jared Babula, Staff Analysis of HVAC Air Filters, Dimming Fluorescent Ballasts, and Heat Pump Water Chilling Packages, 2015. <http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER->

01/TN203717 20150220T141247 Staff Analysis of HVAC Air Filters Dimming Fluorescent Ballasts.pdf

Brent Stephens, Atila Novoselac, PhD, Jeffrey A. Siegel, PhD, 2010. The Effects of Filtration on Pressure Drop and Energy Consumption in Residential HVAC Systems (RP-1299). [http://built-envi.com/publications/stephens\\_etal\\_hvacr\\_2010.pdf](http://built-envi.com/publications/stephens_etal_hvacr_2010.pdf)

John Proctor, P.E., Rick Chitwood, Bruce A. Wilcox, P.E. 2012. Efficiency Characteristics and Opportunities for New California Homes (ECO). <http://www.energy.ca.gov/2012publications/CEC-500-2012-062/CEC-500-2012-062.pdf>

Glen Sharp, Gary Occhiuzzo, 2009, California Residential Appliance Saturation Study, Executive Summary: <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

Harinder Singh, Ken Rider, Jared Babula, and Michael Murza, 2015. Supplemental Initial Statement of Reasons (ISOR) Attachment A. <http://www.energy.ca.gov/appliances/2015-AAER-1/rulemaking/>