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Proposed Regulatory Language

California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1609: Appliance Efficiency Regulations

Section 1601. Scope.

This Article applies to the following types of new appliances, if they are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles, or other mobile equipment. Unless otherwise specified, each provision applies only to units manufactured on or after the effective date of the provision.

NOTE: For the applicability of these regulations to appliances installed in new building construction, see ~~S~~sections 110.0 and 110.1 of ~~P~~part 6 of Title 24 of the California Code of Regulations.

(a) Refrigerators, refrigerator-freezers, ~~and~~ freezers, and miscellaneous refrigeration that can be operated by alternating current electricity, including but not limited to refrigerated bottled or canned beverage vending machines, automatic commercial ice makers, refrigerators with or without doors, freezers with or without doors, walk-in coolers, walk-in freezers, and water dispensers, but excluding the following types:
(1) consumer products with total refrigerated volume exceeding 39 ft^3;
(2) blast chillers; and
(3) automatic commercial ice makers with a harvest rate less than 50 lbs./24 hours and automatic commercial ice makers with a harvest rate greater than 4000 lbs./24 hours.

(b) Room air conditioners, room air-conditioning heat pumps, packaged terminal air conditioners, and packaged terminal heat pumps.

(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~~heating packages.

(d) ~~Spot~~Portable air conditioners, evaporative coolers, residential furnace fans, ceiling fans, ceiling fan light kits, whole house fans, residential exhaust fans, and dehumidifiers.

(e) Vented gas space heaters and vented oil space heaters, vented and unvented infrared gas space heaters, electric residential boilers, and gas-fired combination space-heating and water-heating appliances.

NOTE: See Health and Safety Code ~~S~~section 19881 for restrictions on the sale of unvented gas space heaters and unvented oil space heaters.

(f) Water heaters, including but not limited to hot water supply boilers.

(g) ~~Gas p~~Pool heaters~~, oil pool heaters, electric resistance pool heaters, heat pump pool heaters~~, residential pool pump and motor combinations, replacement residential pool pump motors, ~~and~~ portable electric spas, and pumps.

(h) Plumbing fittings, which are showerheads, lavatory faucets, kitchen faucets that are consumer products, metering faucets, kitchen replacement aerators, lavatory replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, and commercial pre-rinse spray valves.

(i) Plumbing fixtures, which are water closets and urinals.

(j) Fluorescent ~~L~~lamp ~~B~~ballasts and deep-dimming fluorescent lamp ballasts that are designed to:
(1) operate at nominal input voltages of 120 or 277 volts,
(2) operate with an input current frequency of 60 Hertz, and
(3) be used with T5, T8, or T12 lamps; and mercury vapor lamp ballasts.

(k) Lamps, which are federally- regulated general service fluorescent lamps, federally- regulated incandescent reflector lamps, ~~state-regulated~~ general service incandescent lamps, general service lamps, state-regulated light-emitting diode (LED) lamps, state-regulated small-diameter directional lamps, and includes ~~GU-24~~GU24 base lamps.

(l) Emergency lighting, which is illuminated exit signs, and self-contained lighting controls.

(m) Traffic signal modules ~~and traffic signal lamps~~.

(n) Luminaires, which are torchieres, metal halide luminaires, portable luminaires, under-cabinet luminaires, and includes luminaires with ~~GU-24~~GU24 socket and base configurations and ~~GU-24~~ GU24 adaptors.

(o) Dishwashers that are federally- regulated consumer products.

(p) Clothes washers that are federally- regulated consumer products; and commercial clothes washers.

(q) Clothes dryers that are federally- regulated consumer products.

(r) Cooking products that are federally- regulated consumer products; and food service equipment.

(s) Electric motors~~,~~ and compressors, which are:
(1) electric motors, excluding definite purpose motors, special purpose motors, and motors exempted by the U.S. Department of Energy under 42 U.S.C. ~~S~~section 6313(b); or
(2) compressors, which are federally regulated commercial and industrial air compressors.

(t) Distribution transformers which are ~~L~~low voltage dry-type distribution transformers, liquid-immersed distribution transformers, and medium voltage dry-type distribution transformers ~~that are designed to operate at a frequency of 60 Hertz, and that have a rated power output of not less than 15 kVa~~.

(u) External p~~P~~ower supplies, which are single voltage external AC to DC and AC to AC power supplies included with other retail products, and single voltage external AC to DC or AC to AC power supplies sold separately excluding external power supplies that are classified as devices for human use under the Federal Food, Drug, and Cosmetic Act and require U.S. Food and Drug Administration listing and approval as a medical device.

(v) Computers, computer monitors, televisions, signage displays, and consumer audio and video equipment, which are compact audio products, digital versatile disc players, and digital versatile disc recorders.

(w) Battery charger systems, except those:
(1) used to charge a motor vehicle that is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a nonelectrical source of power designed to charge batteries and components thereof. This exception does not apply to forklifts and autoettes, electric personal assistive mobility devices, golf carts, or low speed vehicles, as those vehicles are defined in Division 1 of the California Vehicle Code;

(2) that are classified as Class II or Class III devices for human use under the Federal Food, Drug, and Cosmetic Act and require U.S. Food and Drug Administration listing and approval as a medical device;
(3) used to charge a battery or batteries in an illuminated exit sign, as defined in ~~S~~section 1602(l) of this Article;
(4) with input that is three phase of line-to-line 300 volts root mean square or more and is designed for a stationary power application;
(5) that are battery analyzers;
(6) that are voltage independent or voltage and frequency independent uninterruptible power supplies as defined by the International Electrotechnical Commission (IEC) 62040-3 ed.2.0 (March 2011), or
(7) that are contained completely within a larger product and that:
(~~a~~A) provide power for data storage or for continuity within volatile cache or memory systems;
(~~b~~B) maintain information for system use; and
(~~c~~C) the battery is not capable of powering full operation of the product when AC mains power is removed.

The following document~~s are~~is incorporated by reference in ~~S~~section 1601.

Number ***Title***

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 62040-3 ed.2.0 (March 2011)	Uninterruptible Power Systems
Copies available from:	International Electrotechnical Commission 3, rue de Varembé P.O. Box 131 CH – 1211 Geneva 20 Switzerland http://www.iec.ch Phone: +41 22 919 02 11 FAX: +41 22 919 03 00

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4, and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1602. Definitions.

(a) General.

In this Article the following definitions apply. If a term is not defined here, the applicable definition in NAECA, EPAct, the ~~Energy Policy~~ EPAct ~~of~~ 2005, EISA, or the test methods listed in ~~S~~section 1604 of this Article shall apply where it is reasonable to do so.

"AC" means alternating current.

"Accessible place" means a place on an appliance that can be easily seen without the need for tools to remove any covering.

"Active mode" means a condition in which an energy-using product:
(1) is connected to a main power source;
(2) has been activated; and
(3) provides one or more main functions.

"AHAM" means the Association of Home Appliance Manufacturers.

"AHRI" means the Air-Conditioning, Heating, and Refrigeration Institute.

"ANSI" means the American National Standards Institute.

"Approved industry certification program" means an appliance certification program that ~~the Executive Director has determined, pursuant to Section~~ meets all the criteria shown in section 1603(b)(1) of this Article~~:~~
~~(1) is operated by an appliance manufacturer trade association or other entity approved by the Executive Director;~~
~~(2) is accredited by ANSI or ISO, or has received from a nationally recognized entity an approval that provides substantially similar guarantees of substantive and procedural reliability and accuracy; and~~
~~(3) provides:~~
~~(A) an internet-accessible listing of appropriate energy performance information that is updated at least every 6 months;~~
~~(B) testing of appliances according to applicable test methods and accurate reporting of test results;~~
~~(C) listings that:~~
~~1. include no appliance not meeting an applicable federal standard,~~
~~2. clearly and distinctly indicate which appliances meet the applicable federal standard but do not meet an applicable California standard, which shall be identified, and~~
~~3. where there is no federal standard, clearly and distinctly indicate which appliances do not meet an applicable California standard which shall be identified; and~~
~~(D) verification of manufacturer-submitted data;~~
~~(E) an appropriate procedure for program participants to challenge listed information; and~~
~~(F) compatibility with the database described in Section 1606(c)~~.

"ASHRAE" means the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

"ASME" means the American Society of Mechanical Engineers, International.

"Ballast" means a device used with an electric discharge lamp to obtain necessary circuit conditions (voltage, current, and waveform) for starting and operating.

"Ballast efficacy factor" means the ~~ratio of the~~ relative light output ~~to~~divided by the power input of a fluorescent lamp ballast, as determined using the applicable test method in ~~S~~section 1604(j) of this Article.

"Basic model" of a federally- regulated consumer product means "basic model" as defined in 10 C.F.R. section 430.2. ~~"Basic model" of any other appliance means all units of a given type of appliance (or class thereof) that are manufactured by one manufacturer, that have the same primary energy source, and that do not have any differing electrical, hydraulic, physical, or functional characteristics that affect energy consumption.~~

~~"Basic model" of a distribution transformer, as defined in 10 C.F.R. section 431.192, means a group of models of distribution transformers manufactured by a single manufacturer, that have the same insulation type (i.e., liquid-immersed or dry-type), have the same number of phases (i.e., single or three), have the same standard kVA rating, and do not have any differentiating electrical, physical, or functional features that affect energy consumption. Differences in voltage and differences in basic impulse insulation level (BIL) rating are examples of differentiating electrical features that affect energy consumption.~~

~~"Basic model" of a federally-regulated electric motor, as defined in 10 C.F.R. section 431.12, means all units of a given type of electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics which affect energy consumption or efficiency. For the purpose of this definition, "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which 10 C.F.R. section 431.25 prescribes nominal full load efficiency standards.~~

~~"Basic model" of a federally regulated residential furnace fan, as defined in 10 C.F.R. section 430.2, means all units of a given type of residential furnace fan (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; and that are marketed and/or designed to be installed in the same type of installation.~~

~~"Basic model" of a federally-regulated small electric motor, as defined in 10 C.F.R. section 431.442, means all units of a given type of small electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics that affect energy consumption or efficiency. For the purpose of this definition, "rating" means a combination of the small electric motor's group (i.e., capacitor-start, capacitor-run; capacitor-start, induction-run; or polyphase), horsepower rating (or standard kilowatt equivalent), and number of poles with respect to which 10 C.F.R. section 431.446 prescribes nominal full load efficiency standards.~~

"Basic model" of any other appliance means all units of a given type of appliance (or class thereof) that are manufactured by one manufacturer, that have the same primary energy source, and that do not have any differing electrical, hydraulic, physical, or functional characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency.

"Btu" means British thermal unit, which is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit (1°F).

"°C" means degrees Celsius.

"Candelabra base incandescent lamp" means a lamp that uses candelabra screw base as described in ANSI C81.61-2006, Specifications for Electric Bases, common designations E11 and E12.

"cfm" means cubic feet per minute.

"C.F.R." means Code of Federal Regulations.

"CIE" means the International Commission on Illumination.

"Color rendering index (CRI)" means the measured degree of color shift objects undergo when illuminated by a light source as compared with the color of those same objects when illuminated by a reference source of

comparable color temperature, as determined using the applicable test method in ~~S~~section 1604(k) of this Article.

~~"Commission" means the California Energy Commission.~~

"Compact fluorescent lamp (CFL)" means an integrated or non-integrated single-base, low-pressure mercury, electric-discharge source in which a fluorescing coating transforms some of the ultraviolet energy generated by the mercury discharge into light; the term does not include circline or U-shaped lamps.

"Consumer product" means any article~~,~~ (other than an automobile, as defined in section 501(1) of the federal Motor Vehicle Information and Cost Savings Act~~49 U.S.C. section 32901(a)(3)~~):

(1) of a type
   (A) which in operation consumes, or is designed to consume, energy or, with respect to showerheads, faucets, water closets, and urinals, water; and
   (B) which, to any significant extent, is distributed in commerce for personal use or consumption by individuals;
(2) without regard to whether such article of such type is in fact distributed in commerce for personal use or consumption by an individual, except that such term includes fluorescent lamp ballasts, general service fluorescent lamps, incandescent reflector lamps, showerheads, faucets, water closets, and urinals distributed in commerce for personal or commercial use or consumption.

"CSA" means Canadian Standards Association.

~~"Database" means the database established pursuant to section 1606(c).~~

~~"Date of sale" means the day when the appliance is physically delivered to the buyer.~~

"DC" means direct current.

"Design standard" means a prescriptive standard, such as a ban on constant burning pilots or a requirement that a clothes washer have a particular feature.

"Directory" means a directory, a supplement thereto, or a part of a directory or supplement.

"EISA" means the Energy Independence and Security Act of 2007, 42 U.S.C. section 6291 et seq.

"Electric resistance heating" means the production of heat by passing electric current through a resistive element.

"Electronic ballast" means a device that uses semiconductors as the primary means to control lamp starting and operation.

"Energy Commission" means the State Energy Resources Conservation and Development Commission.

"Energy efficiency standard" means a performance standard expressed in numerical form, such as energy factor, EER, or thermal efficiency.

"EPAct" means the Energy Policy Act of 1992, 42 U.S.C. section ~~6311~~6291 et seq.

"EPAct 2005" means the Energy Policy Act of 2005, 42 U.S.C. section ~~6311~~6291 et seq.

"EPCA" means the Energy Policy and Conservation Act, as amended, 42 U.S.C. section 6291 et seq.

"Executive Director" means the Executive Director of the Energy Commission or his or her designee.

"°F" means degrees Fahrenheit.

"Federally-regulated appliance" means an appliance that is federally-regulated commercial and industrial equipment or a federally-regulated consumer product.

"Federally-regulated commercial and industrial equipment" means commercial and industrial equipment for which there exists a test method and an energy conservation standard prescribed by or under NAECA, EPAct, EPAct 2005, or EISA.

"Federally-regulated consumer product" means a consumer product for which there exists a test method and an energy conservation standard prescribed by or under NAECA, EPAct, EPAct 2005, or EISA.

"fpm" means feet per minute.

"ft^3" means cubic feet.

"Gallon (g)" means U.S. liquid gallon.

"Gas" means natural gas or liquefied petroleum gas.

"gpm" means gallons per minute.

"HI" means the Hydraulic Institute.

"HI-A" means the Hydronics Institute section of AHRI.

"High intensity discharge (HID) lamp" means an electric-discharge lamp in which:
(1) the light-producing arc is stabilized by bulb wall temperature; and
(2) the arc tube has a bulb wall loading in excess of 3 Watts/cm2, including such lamps that are mercury vapor, metal halide, and high-pressure sodium lamps.

"HP" means horsepower.

"IAPMO" means the International Association of Plumbing and Mechanical Officials.

"Identifiers", when referenced in relation to Table X data submittal requirements, means those fields shown in Table X for each specific appliance type that, when taken in combination for a specific model of a specific appliance type, represent the criteria for designating a model. At a minimum, each specific appliance type's model "identifiers" will include (a) manufacturer, (b) brand, and (c) model number. Individual appliance types may include additional fields as identifiers. All identifiers are represented in Table X by an asterisk ("*"). For purposes of compliance with ~~S~~section 1606(e)(1) of this Article, the identifiers represent fields that cannot be modified.

"IEC" means the International Electrotechnical Commission.

"ISO" means the International Organization for Standardization.

"kW" means kilowatt.

"kWh" means kilowatt-hour.

"Light emitting diode (LED)" means a p-n junction solid state device, the radiated output of which is a function of the physical construction, material used, and exciting current of the device. The output of a light-emitting diode may be in:
(1) the infrared region;
(2) the visible region; or
(3) the ultraviolet region.

"LPG" or "LP-gas" means liquefied petroleum gas, and includes propane, butane, and propane/butane mixtures. ~~"average lamp efficacy (LPW)"~~

"LPW" (lumens per watt) means "average lamp efficacy (LPW)" as defined in ~~S~~section 1602(k) of this Article.

"Luminaire" means a complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position, and protect the lamps and to connect the lamps to the power supply.

"MAEDbS" means the Modernized Appliance Efficiency Database System established pursuant to section 1606(c) of this Article and maintained by the Energy Commission.

"Manufacturer" means any person engaged in the original production or assembly of an appliance or commercial and industrial equipment or any person that assumes the complete legal responsibility for the original production or assembly of an appliance, which includes, but is not limited to, the responsibility normally held by the manufacturer for product liability, warranty, and compliance with State and federal law. "Manufacturer" also means a private brand packager or reassembler.

"Mercury vapor lamp" means a high intensity discharge lamp, including clear, phosphor-coated, and self-ballasted screw base lamps, in which the major portion of the light is produced by radiation from mercury typically operating at a partial vapor pressure in excess of 100,000 PA (approximately 1 atm).

"Mercury vapor lamp ballast" means a device that is designed and marketed to start and operate mercury vapor lamps intended for general illumination by providing the necessary voltage and current.

"Model" means any collection of appliance units to which the manufacturer has assigned the same model number.

"Model number" means a combination of letters, digits, or characters representing the manufacturer, brand, design, or performance of an appliance. In the case of electric motors, "model number" refers to the designation of a "basic model", as defined in 10 C.F.R. section 431.12, in a manner specified by the Executive Director.

"NAECA" means the National Appliance Energy Conservation Act, 42 U.S.C. section 6291 et seq.

"NEMA" means the National Electrical Manufacturers Association.

"Non-federally- regulated appliance" means an appliance that is neither federally- regulated commercial and industrial equipment nor a federally- regulated consumer product.

"NSF International" means the National Sanitation Foundation, International.

"OSA" means the Optical Society of America.

"Other mobile equipment" means transportation machinery including but not limited to cars, trucks, trains, airplanes, boats, and buses, but excluding mobile homes and manufactured homes.

"Ozone-depleting substance" means any substance that has been found by the United States Environmental Protection Agency to act as a catalyst in the breaking down of ozone, O_3, into molecular oxygen, O_2.

"Performance standard" means a standard that specifies a minimum level of energy or water efficiency or a maximum level of energy or water consumption of an appliance.

"Pin-based" means:
(1) the base of a fluorescent lamp that is not integrally ballasted and that has a plug-in lamp base, including multi-tube, multibend, spiral, and circline types; or
(2) a socket that holds such a lamp.

“Power factor” means the ratio of the real power to the apparent power.

“Private brand packager” means any person or entity that buys products from a manufacturer, packages them using its own brand name, and distributes them for sale using its own brand name.

“Reassembler” means any person or entity that buys products from a manufacturer, modifies them, and distributes them for sale using its own brand name.

“Recreational vehicle” means a van or utility vehicle used for recreational purposes.

“RPM” means revolutions per minute.

“Secretary” means the Secretary of the United States Department of Energy (U.S. DOE).

“~~Stand-by~~ Standby mode” means the condition in which an energy-using product:
(1) is connected to a main power source; and
(2) offers one or more of the following user-oriented or protective functions:
   (A) ~~To~~to facilitate the activation or deactivation of other functions (including active mode) by remote switch (including remote control), internal sensor, or timer~~.~~; or
   (B) ~~C~~continuous functions, including information or status displays (including clocks) or sensor-based functions.

“Statement,” as used in ~~S~~section 1606 of this Article, means a single and complete line of data for a specific model and end-use, containing all the data required in Table X for that appliance type.

“UL” means Underwriters Laboratories, Inc.

“UPS” means uninterruptible power supply.

“U.S.C.” means the United States Code.

~~“UUT” means unit under test~~.

(b) Refrigerators, Refrigerator-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 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 in cubic feet.~~

“All-refrigerator” means a~~n electric~~ refrigerator ~~which~~that does not include a compartment ~~for the freezing and long time storage of food at~~ capable of maintaining compartment temperatures below 32°F~~.~~ (0.0°C~~.~~) as determined according to the provisions in 10 C.F.R. section 429.14(d)(2). It may include a compartment of 0.50 ~~cubic feet~~ft^3 capacity (14.2 liters) or less for the freezing and storage of ice.

“Annual walk-in energy factor (AWEF)” means a ratio of the total heat, not including the heat generated by the operation of refrigeration systems, removed, in Btu, from a walk-in box during one year period of usage for refrigeration to the total energy input of refrigeration systems, in watt-hours, during the same period.

“Anti-condensate energy consumption (AEC)” means the anti-condensate energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

“Anti-sweat heater” means a device incorporated into the design of a ~~refrigerator or refrigerator-freezer~~ product to prevent the accumulation of moisture on exterior or interior surfaces of the cabinet as defined in 10 C.F.R. part 430 Appendix A to ~~S~~subpart B.

"Anti-sweat heater switch" means a user-controllable switch or user interface which modifies the activation or control of anti-sweat heaters.

"Automatic commercial ice maker" means a factory-made assembly (not necessarily shipped in one package) that:
(1) consists of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice; and
(2) may include means for storing ice, dispensing ice, or storing and dispensing ice.

"Automatic defrost system" or "automatic defrost" means a system in which the defrost cycle is automatically initiated and terminated, with resumption of normal refrigeration at the conclusion of the defrost operation. The system automatically prevents the permanent formation of frost on all refrigerated surfaces. ~~Nominal refrigerated food temperatures are maintained during the operation of the automatic defrost system.~~

"Basic model" of federally regulated commercial refrigeration equipment means all commercial refrigeration equipment manufactured by one manufacturer within a single equipment class, having the same primary energy source, and that have essentially identical electrical, physical, and functional characteristics that affect energy consumption.

"Basic model" of a federally regulated walk-in cooler or walk-in freezer that is commercial or industrial equipment means all components of a given type of walk-in cooler or walk-in freezer (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; and with respect to panels, which do not have any differing features or characteristics that affect U-factor.

"Batch type ice maker" means an ice maker having alternate freezing and harvesting periods. This includes automatic commercial ice makers that produce cube type ice and other batch technologies.

"Blast chiller" means a refrigerator designed to cool food products from 140°F to 40°F within four hours.

"Bottle-type water dispenser" means a water dispenser that uses a bottle or reservoir as the source of potable water.

"Bottled or canned beverage" means a beverage in a sealed container.

"Buffet table" means a commercial refrigerator, such as a salad bar, that is designed with mechanical refrigeration and that is intended to receive refrigerated food, to maintain food product temperatures, and for customer service.

"Built-in compact cooler" means any cooler with a total refrigerated volume less than 7.75 ft^3 and no more than 24 inches in depth, excluding doors, handles, and custom front panels, that is designed, intended, and marketed exclusively to be:
(1) installed totally encased by cabinetry or panels that are attached during installation;
(2) securely fastened to adjacent cabinetry, walls or floor;
(3) equipped with unfinished sides that are not visible after installation; and
(4) equipped with an integral factory-finished face or built to accept a custom front panel.

"Built-in cooler" means any cooler with a total refrigerated volume of 7.75 ft^3 or greater and no more than 24 inches in depth, excluding doors, handles, and custom front panels; that is designed, intended, and marketed exclusively to be:
(1) installed totally encased by cabinetry or panels that are attached during installation;
(2) securely fastened to adjacent cabinetry, walls or floor;
(3) equipped with unfinished sides that are not visible after installation; and
(4) equipped with an integral factory-finished face or built to accept a custom front panel.

"Built-in freezer" means any freezer with 7.75 ft³ or greater total volume and 24 inches or less depth not including doors, handles, and custom front panels; with sides which are not finished and not designed to be visible after installation; and that is designed, intended, and marketed exclusively to:
(1) be installed totally encased by cabinetry or panels that are attached during installation,
(2) be securely fastened to adjacent cabinetry, walls or floor, and
(3) either be equipped with an integral factory-finished face or accept a custom front panel.

"Built-in refrigerator" means any refrigerator with 7.75 ft³ or greater total volume and 24 inches or less depth not including doors, handles, and custom front panels; with sides which are not finished and not designed to be visible after installation; and that is designed, intended, and marketed exclusively to:
(1) be installed totally encased by cabinetry or panels that are attached during installation,
(2) be securely fastened to adjacent cabinetry, walls or floor, and
(3) either be equipped with an integral factory-finished face or accept a custom front panel.

"Built-in refrigerator-freezer" means any refrigerator-freezer with 7.75 ft³ or greater total volume and 24 inches or less depth not including doors, handles, and custom front panels; with sides which are not finished and not designed to be visible after installation; and that is designed, intended, and marketed exclusively to:
(1) be installed totally encased by cabinetry or panels that are attached during installation,
(2) be securely fastened to adjacent cabinetry, walls or floor, and
(3) either be equipped with an integral factory-finished face or accept a custom front panel.

"Calculated daily energy consumption (CDEC)" means the calculated daily energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Chest freezer" means a freezer to which access is gained through a top-opening door.

"Class A," when used to define a refrigerated bottled or canned beverage vending machine, means a refrigerated bottled or canned beverage vending machine that is ~~fully cooled, and is~~ not a combination vending machine and in which 25 percent or more of the surface area on the front side of the beverage vending machine is transparent.

"Class B," when used to define a refrigerated bottled or canned beverage vending machine, means any refrigerated bottled or canned beverage vending machine not considered to be Class A, and is not a combination vending machine.

"Closed solid" means commercial refrigeration equipment with doors, and in which more than 75 percent of the outer surface area of all doors on a unit are not transparent.

"Closed transparent" means commercial refrigeration equipment with doors, and in which 25 percent or more of the outer surface area of all doors on the unit are transparent.

"Combination A" means a combination vending machine where 25 percent or more of the surface area on the front side of the beverage vending machine is transparent.

"Combination B" means a combination vending machine that is not considered to be Combination A.

"Combination cooler refrigeration product" means any cooler-refrigerator, cooler-refrigerator-freezer, or cooler-freezer.

"Combination vending machine" means a ~~refrigerated~~ bottled or canned beverage vending machine ~~that also has non-refrigerated volumes for the purpose of vending other, non-"sealed beverage" merchandise~~ containing two or more compartments separated by a solid partition, that may or may not share a product delivery chute, in which at least one compartment is designed to be refrigerated, as demonstrated by the presence of temperature controls, and at least one compartment is not.

"Commercial hybrid refrigerator, freezer, and refrigerator-freezer" means a commercial refrigerator, freezer, or refrigerator-freezer that consists of two or more thermally separated refrigeration compartments:

(1) that are in two or more different equipment families;
(2) and that is sold as a single unit.

"Commercial refrigerator, commercial freezer, or commercial refrigerator-freezer" means refrigeration equipment that:
(1) is not a federally regulated consumer product, within the meaning of 10 C.F.R. part 430, section 430.2;
(2) is not designed and marketed exclusively for medical, scientific, or research purposes;
(3) operates at a chilled, frozen, combination chilled and frozen, or variable temperature;
(4) displays or stores merchandise and other perishable materials horizontally, semi-vertically, or vertically;
(5) has transparent or solid doors, sliding or hinged doors, a combination of hinged, sliding, transparent, or solid doors, or no doors;
(6) is designed for pull-down temperature applications or holding temperature applications; and
(7) is connected to a self-contained condensing unit or to a remote condensing unit.

"Compact freezer" means a freezer that has total volume less than 7.75 ft^3~~: (1) rated volume, as determined using 10 C.F.R. part 430, Appendix B1 of Subpart B and that is manufactured before September 15, 2014; (2)~~ as determined using the applicable test procedure prescribed in 10 C.F.R. part 430, Appendix B of ~~S~~subpart B~~ and that is manufactured on or after September 15, 2014~~.

"Compact refrigerator" means a refrigerator that has total volume less than 7.75 ft^3~~. (1) rated volume, as determined using 10 C.F.R. part 430, Appendix A1 of Subpart B and that is manufactured before September 15, 2014; (2)~~ as determined using the applicable test procedure prescribed in 10 C.F.R. part 430, Appendix A of ~~S~~subpart B~~ and that is manufactured on or after September 15, 2014~~.

"Compact refrigerator-freezer" means a refrigerator-freezer that has total volume less than 7.75 ft^3 as determined using the applicable test procedure prescribed in 10 C.F.R. part 430, Appendix A of ~~S~~subpart B.

"Compressor energy consumption (CEC)" means the compressor energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Condensate evaporator pan energy consumption (PEC)" means the condensate evaporator pan energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Consumer refrigeration product" means a refrigerator, refrigerator-freezer, freezer, or miscellaneous refrigeration product.

"Continuous type ice maker" means an ice maker that continually freezes and harvests ice at the same time.

"Cooler" means a cabinet, used with one or more doors, that has a source of refrigeration capable of operating on single-phase, alternating current, and is capable of maintaining compartment temperatures either:
(1) No lower than 39°F (3.9°C); or
(2) In a range that extends no lower than 37°F (2.8°C) but at least as high as 60°F (15.6°C) as determined according to the applicable provisions in 10 C.F.R. section 429.61(d)(2).

"Cooler-all-refrigerator" means a cooler-refrigerator that does not include a compartment capable of maintaining compartment temperatures below 32°F (0°C) as determined according to the provisions in 10 C.F.R. section 429.61(d)(2). It may include a compartment of 0.50 ft^3 capacity (14.2 liters) or less for the freezing and storage of ice.

"Cooler compartment" means a refrigerated compartment designed exclusively for wine or other beverages within a consumer refrigeration product that is capable of maintaining compartment temperatures either (a) no lower than 39°F (3.9°C), or (b) in a range that extends no lower than 37°F (2.8°C) but at least as high as 60°F (15.6°C) as determined according to 10 C.F.R. section 429.14(d)(2) or section 429.61(d)(2).

"Cooler-freezer" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only, and consists of two or more compartments,

including at least one cooler compartment as defined in 10 C.F.R. part 430, Appendix A of subpart B, where the remaining compartment(s) are capable of maintaining compartment temperatures at 0°F (−17.8°C) or below as determined according to the provisions in 10 C.F.R. section 429.61(d)(2).

"Cooler-refrigerator" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only, and consists of two or more compartments, including at least one cooler compartment as defined in 10 C.F.R. part 430, Appendix A of subpart B, where:

(1) at least one of the remaining compartments is not a cooler compartment as defined in 10 C.F.R. part 430, Appendix A of subpart B and is capable of maintaining compartment temperatures above 32°F (0°C) and below 39°F (3.9°C) as determined according to 10 C.F.R. section 429.61(d)(2);
(2) the cabinet may also include a compartment capable of maintaining compartment temperatures below 32°F (0°C) as determined according to 10 C.F.R. section 429.61(d)(2); but
(3) the cabinet does not provide a separate low temperature compartment capable of maintaining compartment temperatures below 8°F (−13.3°C) as determined according to 10 C.F.R. section 429.61(d)(2).

"Cooler-refrigerator-freezer" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only, and consists of three or more compartments, including at least one cooler compartment as defined in 10 C.F.R. part 430, Appendix A of subpart B, where:

(1) At least one of the remaining compartments is not a cooler compartment as defined in 10 C.F.R. part 430, Appendix A of subpart B and is capable of maintaining compartment temperatures above 32°F (0°C) and below 39°F (3.9°C) as determined according to 10 C.F.R. section 429.61(d)(2); and
(2) At least one other compartment is capable of maintaining compartment temperatures below 8°F (−13.3°C) and may be adjusted by the user to a temperature of 0°F (−17.8°C) or below as determined according to 10 C.F.R. section 429.61(d)(2).

"Cube type ice" means ice that is fairly uniform, hard, solid, usually clear, and generally weighs less than two ounces (60 grams) per piece, as distinguished from flake, crushed, or fragmented ice.

"Defrost energy consumption (DEC)" means the defrost energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Display door" means a door that:
(1) Is designed for product display; or
(2) Has 75 percent or more of its surface area composed of glass or another transparent material.

"Door" means a movable panel that separates the interior volume of a unit of commercial refrigeration equipment from the ambient environment and is designed to facilitate access to the refrigerated space for the purpose of loading and unloading product. This includes hinged doors, sliding doors, and drawers. This does not include night curtains.

"Door" of a walk-in cooler or walk-in freezer means an assembly installed in an opening on an interior or exterior wall that is used to allow access or close off the opening and that is movable in a sliding, pivoting, hinged, or revolving manner of movement. For walk-in coolers and walk-in freezers, a door includes the door panel, glass, framing materials, door plug, mullion, and any other elements that form the door or part of its connection to the wall.

"Door angle" means, for equipment with:

(1) flat doors, the angle between a vertical line and the line formed by the plane of the door, when the equipment is viewed in cross-section; and
(2) curved doors, the angle formed between a vertical line and the straight line drawn by connecting the top and bottom points where the display area glass joins the cabinet, when the equipment is viewed in cross-section.

"Drawer unit" means a residential refrigerator, residential freezer, or residential refrigerator-freezer, one or more of whose externally- accessed compartments are drawers.

"Energy use" of an automatic commercial ice maker means the total energy consumed, stated in kilowatt hours per one-hundred pounds (kWh/100 lb) of ice stated in multiples of 0.1. For remote condensing (but not remote compressor) automatic commercial ice makers and remote condensing and remote compressor automatic commercial ice makers, total energy consumed shall include the energy use of the ice-making mechanism, the compressor, and the remote condenser or condensing unit.

"Envelope" of a walk-in cooler or walk-in freezer means:
(1) the ~~walls and ceiling of the~~ portion of a walk-in cooler or walk-in freezer ~~but not the doors or floors~~ that isolates the interior, refrigerated environment from the ambient, external environment; and
(2) all energy-consuming components of the walk-in cooler or walk-in freezer that are not part of its refrigeration system.

"Fan energy consumption (FEC)" means the fan energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Flake ice" means ice produced by freezing a thin layer of water on a refrigerated cylinder and removing by a scraper.

"Freezer" means a cabinet that is designed as a unit for the freezing and storage of food, beverages, or ice at temperatures of 0°F or below and that has a source of refrigeration requiring an energy input.

"Freezer" that is a federally regulated consumer product means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only and is capable of maintaining compartment temperatures of 0°F (−17.8°C) or below as determined according to the provisions in 10 C.F.R. section 429.14(d)(2). It does not include any refrigerated cabinet that consists solely of an automatic ice maker and an ice storage bin arranged so that operation of the automatic icemaker fills the bin to its capacity. However, the term does not include any:
(1) product that does not include a compressor and condenser unit as an integral part of the cabinet assembly; or
(2) miscellaneous refrigeration product that must comply with an applicable miscellaneous refrigeration product energy conservation standard.

~~"Freezer compartment" means a compartment designed for the freezing and storage of food, beverages, or ice at temperatures below 8°F.~~

"Freezer volume" means net freezer compartment volume as defined in "adjusted total volume" definition found in 10 C.F.R. part 430, Appendix B to ~~S~~subpart B.

"Freight door" means a door that is not a display door and is equal to or larger than 4 feet wide and 8 feet tall.

"Harvest rate" means the amount of ice (at 32°F) in pounds produced per 24 hours.

"Holding temperature application" means a use of commercial refrigeration equipment other than a pull-down temperature application, except a blast chiller or freezer.

"Horizontal closed" means commercial refrigeration equipment with hinged or sliding doors and a door angle greater than or equal to 45°.

"Horizontal open" means commercial refrigeration equipment without doors and an air-curtain angle greater than or equal to 80° from the vertical.

"Ice cream cabinet" means a reach-in cabinet commercial freezer that has top, or top and side, doors that are hinged or sliding and that is designed for the storage or dispensing of ice cream or similar foods.

"Ice cream freezer" means a commercial freezer that is designed to operate at or below -5°F (± 2°F) (-21°C ± 1.1°C) and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.

"Ice hardness factor" means the latent heat capacity of harvested ice, in British thermal units per pound of ice (Btu/lb), divided by 144 Btu/lb, expressed as a percent.

~~"Ice-cream freezer" means a commercial freezer that is designed to operate at or below -5 F (± 2 F) (-21 C ± 1.1 C) and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.~~

"Ice-making head" means automatic commercial ice makers that do not contain integral storage bins, but are generally designed to accommodate a variety of bin capacities. Storage bins entail additional energy use not included in the reported energy consumption figures for these units.

"Integrated average temperature" means the average temperature of all test package measurements taken during the test as determined using the applicable test method in ~~S~~section 1604(a) of this Article.

~~"Internal freezer refrigerator" means a refrigerator that includes a compartment contained within the refrigerator cabinet that is designed for the short-term storage of food at temperatures below 32°F.~~

"Kitchen unit" means a compact refrigerator, with or without an internal freezer, integrated with other appliances or facilities, including but not limited to microwave ovens, sinks, and electric cooktops.

"Lighting energy consumption (LEC)" means the lighting energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Manual defrost system" means a defrost system in which the defrosting action for refrigerated surfaces is initiated or terminated manually.

"Maximum condenser water use" of an automatic commercial ice maker means the maximum amount of water used by the condensing unit (if water-cooled), stated in gallons per 100 pounds (gal/100 lb) of ice, in multiples of one.

"Maximum daily energy consumption (MDEC)" means the maximum daily energy consumption in kilowatt hours per day.

"Milk, beverage, and ice cream cabinet" means a reach-in cabinet commercial refrigerator-freezer that has top, or both top and side, doors that are hinged or sliding and that is designed for the storage or dispensing of milk or other beverages, and ice cream or similar foods.

"Milk or beverage cabinet" means a reach-in cabinet commercial refrigerator that has top, or both top and side, doors that are hinged or sliding and that is designed for the storage or dispensing of milk or other beverages.

"Miscellaneous refrigeration product" means a federally regulated consumer refrigeration product other than a refrigerator, refrigerator-freezer, or freezer, which includes coolers and combination cooler refrigeration products.

"Non-commercial freezer" means a freezer:
(1) ~~a freezer~~ that is a federally- regulated consumer product or
(2) ~~a freezer~~ exceeding 30 ft^3 but not exceeding 39 ft^3 that is a consumer product.

"Non-commercial refrigerator" means a refrigerator that is a federally- regulated consumer product ~~or a wine chiller that is a consumer product~~.

"Non-commercial refrigerator-freezer" means a refrigerator-freezer that is a federally- regulated consumer product.

"Operating temperature" means the range of integrated average temperatures at which a self-contained commercial refrigeration unit or remote-condensing commercial refrigeration unit with a thermostat is capable of operating or, in the case of a remote-condensing commercial refrigeration unit without a thermostat, the range of integrated average temperatures at which the unit is marketed, designed, or intended to operate.

"Partial automatic defrost system" means a defrost system in which the defrosting action for refrigerated surfaces in the refrigerator compartment is initiated and terminated automatically and the defrosting action for refrigerated surfaces in the freezer is initiated manually.

"Passage door" means a door that is not a freight or display door.

"Pass-through cabinet" means a commercial refrigerator or commercial freezer with hinged or sliding doors on both front and rear of the refrigerator or freezer.

"Point of use water dispenser" means a water dispenser that uses a pressurized water utility connection as the source of potable water.

"Preparation table" means a commercial refrigerator with a countertop refrigerated compartment with or without cabinets below, and with self-contained refrigeration equipment.

"Pull-down temperature application" means a commercial refrigerator with doors that, when fully loaded with 12 ounce beverage cans at 90°F, can cool those beverages to an average stable temperature of 38°F in 12 hours or less.

"Rating temperature" means the integrated average temperature a unit must maintain during testing (i.e., either as listed in Tables A-4, A-5, or A-6 of this Article or the lowest application product temperature).

"Reach-in cabinet" means a commercial refrigerator, commercial refrigerator-freezer, or commercial freezer with hinged or sliding doors or lids, but excluding roll-in or roll-through cabinets and pass-through cabinets.

"Refrigerated bottled or canned beverage vending machine" means a commercial refrigerator that cools bottled or canned beverages and dispenses the~~m~~ bottled or canned beverages upon payment.

~~"Refrigerated multi-package beverage vending machine" means a refrigerated beverage vending machine that is able to display and dispense at least 20 discrete types of beverages.~~

"Refrigerator" means a cabinet ~~that is designed for the refrigerated storage of food, including but not limited to solid food and wine, beer, and other beverages, at temperatures above 32°F, and that has a source of refrigeration requiring an energy input. It may include a compartment for the freezing and storage of food at temperatures below 32°F, but it does not provide a separate low temperature compartment designed for the freezing and storage of food at temperatures below 8°F.~~
used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only and is capable of maintaining compartment temperatures above 32°F (0°C) and below 39°F (3.9°C) as determined according to 10 C.F.R. section 429.14(d)(2). A refrigerator may include a compartment capable of maintaining compartment temperatures below 32°F (0°C), but does not provide a separate low temperature compartment capable of maintaining compartment temperatures below 8°F (−13.3°C) as determined according to 10 C.F.R. section 429.14(d)(2). However, the term does not include:
(1) any product that does not include a compressor and condenser unit as an integral part of the cabinet assembly;
(2) a cooler; or
(3) any miscellaneous refrigeration product that must comply with an applicable miscellaneous refrigeration product energy conservation standard.

"Refrigerator compartment" means a compartment designed for the refrigerated storage of food, including but not limited to solid food and wine, beer, and other beverages, at temperatures above 32°F.

"Refrigerator volume" means fresh food compartment volume as defined in 10 C.F.R. part 430, Appendix A to ~~S~~subpart B.

~~"Refrigerator-freezer" means a cabinet that~~
~~(1) consists of two or more compartments with at least one of the compartments designed for the refrigerated storage of food, including but not limited to solid food and wine, beer, and other beverages, at temperatures above 32°F;~~
~~(2) has at least one of the compartments designed for the freezing and storage of food or ice at temperatures below 8°F that may be adjusted by the user to a temperature of 0°F or below; and~~
~~(3) has a source of refrigeration requiring an energy input.~~

"Refrigerator-freezer" means a cabinet, used with one or more doors, that has a source of refrigeration that requires single-phase, alternating current electric energy input only and consists of two or more compartments where at least one of the compartments is capable of maintaining compartment temperatures above 32° F (0° C) and below 39° F (3.9° C) as determined according to 10 C.F.R. section 429.14(d)(2), and at least one other compartment is capable of maintaining compartment temperatures of 8° F (−13.3° C) and may be adjusted by the user to a temperature of 0° F (−17.8° C) or below as determined according to 10 C.F.R. section 429.14(d)(2). However, the term does not include:
(1) Any product that does not include a compressor and condenser unit as an integral part of the cabinet assembly; or
(2) Any miscellaneous refrigeration product that must comply with an applicable miscellaneous refrigeration product energy conservation standard.

"Remote," in reference to any refrigerator, freezer, refrigerator-freezer, reach-in cabinet, pass-through cabinet, roll-in or roll-through cabinet, walk-in cooler, or walk-in freezer means an appliance that:
(1) receives refrigerant fluid from a condensing unit located externally to its cabinet assembly; and
(2) is capable of being purchased and installed with different types of compressor or condenser, so that its efficiency depends on the type of compressor or condenser applied by the purchaser, installer, or user.

"Remote condensing unit" means a factory-made assembly of refrigerating components designed to compress and liquefy a specific refrigerant that is remotely located from the refrigerated equipment and consists of one or more refrigerant compressors, refrigerant condensers, condenser fans and motors, and factory supplied accessories.

"Roll-in or roll-through cabinet" means a commercial refrigerator or commercial freezer that allows wheeled racks of product to be rolled into or through the refrigerator or freezer.

"Self-contained condensing unit" means a factory-made assembly of refrigerating components designed to compress and liquefy a specific refrigerant that is an integral part of the refrigerated equipment and consists of one or more refrigerant compressors, refrigerant condensers, condenser fans and motors, and factory supplied accessories.

"Self-contained freezer" means a freezer that has the condensing unit mounted in or on the freezer cabinet.

"Self-contained refrigerator" means a refrigerator that has the condensing unit mounted in or on the refrigerator cabinet.

"Self-contained refrigerator-freezer" means a refrigerator-freezer that has the condensing unit mounted in or on the refrigerator-freezer cabinet.

"Semivertical open" means commercial refrigeration equipment without doors and an air-curtain angle greater than or equal to 10° and less than 80° from the vertical.

"Service over counter" means equipment that has sliding or hinged doors in the back intended for use by sales personnel, with glass or other transparent material in the front for displaying merchandise, and that has a height not greater than 66 inches and is intended to serve as a counter for transactions between sales personnel and customers. "Service over the counter, self-contained, medium temperature commercial refrigerator", also defined in this section, is one specific equipment class within the service over counter equipment family).

"Service over the counter, self-contained, medium temperature commercial refrigerator" means a commercial refrigerator:—
(1) That operates at temperatures at or above 32° F;
(2) With a self-contained condensing unit;
(3) Equipped with sliding or hinged doors in the back intended for use by sales personnel, and with glass or other transparent material in the front for displaying merchandise; and
(4) That has a height not greater than 66 inches and is intended to serve as a counter for transactions between sales personnel and customers.

"Special compartment" that is part of a federally regulated freezer consumer product means any compartment without doors directly accessible from the exterior, and with separate temperature control that is not convertible from fresh food temperature range to freezer temperature range.

"Special compartment" that is part of a federally regulated refrigerator or refrigerator-freezer consumer product means any compartment other than a butter conditioner or a cooler compartment, without doors directly accessible from the exterior, and with separate temperature control (such as crispers convertible to meat keepers) that is not convertible from the fresh food temperature range to the freezer temperature range.

"Standard vendible capacity" means the maximum quantity of standard product that can be dispensed from one full loading of a refrigerated bottled or canned beverage vending machine without further reload operations when used as recommended by the manufacturer.

"Through-the-door ice/water dispenser" means a device incorporated within the cabinet, but outside the boundary of the refrigerated space, that delivers to the user on demand ice and may also deliver water from within the refrigerated space without opening an exterior door. This definition includes dispensers that are capable of dispensing ice and water or ice only.

"Total daily energy consumption (TDEC)" means the total daily energy consumption of commercial refrigeration equipment with two or more compartments as described in 10 C.F.R. section 431.66.

"Total display area (TDA)" of a commercial refrigerator, commercial freezer, or commercial refrigerator-freezer means the total display area (ft^2) of the case, as defined in the AHRI Standard 1200–2006, Appendix~~appendix~~ D (I-P)-2010 (as referenced in 10 C.F.R. section 431.66~~64~~).

~~"Total volume" means the sum of refrigerator volume and freezer volume.~~

"Transparent" means greater than or equal to 45 percent light transmittance, as determined in accordance with the ASTM Standard E 1084-86 (Reapproved 2009), at normal incidence and in the intended direction of viewing.

"Undercounter cabinet" means a reach-in cabinet commercial refrigerator or reach-in cabinet commercial freezer that has no worktop surface and that is intended for installation under a separate counter.

"Upright freezer" means a freezer to which access is gained through a side-opening door.

"Vertical closed" means commercial refrigeration equipment with hinged or sliding doors and a door angle less than 45°.

"Vertical open" means commercial refrigeration equipment without doors and an air-curtain angle greater than or equal to 0° and less than 10° from the vertical.

"Walk-in cooler" means an enclosed storage space refrigerated to temperatures above 32°F that can be walked into and has a total chilled storage area of less than 3,000 square feet. "Walk-in cooler" does not include products designed and marketed exclusively for medical, scientific, or research purposes.

"Walk-in freezer" means an enclosed storage space refrigerated to temperatures at or below 32°F that can be walked into and has a total chilled storage area of less than 3,000 square feet. "Walk-in freezer" does not include products designed and marketed exclusively for medical, scientific, or research purposes.

"Water dispenser" means a factory-made assembly that mechanically cools and heats potable water and that dispenses the cooled ~~or~~and heated water by integral or remote means.

"Wedge case" means a commercial refrigerator, freezer, or refrigerator-freezer that forms the transition between two regularly shaped display cases.

~~"Wine chiller" means a refrigerator designed for the cooling and storage of wine.~~

"Worktop table" means a counter-height commercial refrigerator or freezer with a worktop surface.

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

"Air conditioner" means an appliance that supplies cooled air to a space for the purpose of cooling objects within the space.

"Air-cooled air conditioner" means an air conditioner using an air-cooled condenser.

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

"Air filter depth" means air filter thickness dimension measured perpendicular to the face area plane, expressed in inches.

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

~~"Air filter depth" means air filter thickness dimension measured perpendicular to the face area plane, expressed in inches.~~

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

"Air-source heat pump" means an appliance that consists of one or more factory-made assemblies, that includes an indoor conditioning coil, a compressor, and a refrigerant-to-air heat exchanger, and that provides heating and cooling functions.

"Basic model" of federally regulated computer room air conditioners means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common "nominal" cooling capacity.

"Basic model" of federally regulated packaged terminal air conditioner (PTAC) or packaged terminal heat pump (PTHP) means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparable compressors, same or comparable heat exchangers, and same or comparable air moving systems that have a cooling capacity within 300 Btu/h of one another.

"Basic model" of federally regulated single package vertical units means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a rated cooling capacity within 1500 Btu/h of one another.

"Basic model" of federally regulated small, large, and very large air-cooled or water-cooled commercial package air conditioning and heating equipment means all units manufactured by one manufacturer within a single equipment class, having the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common "nominal" cooling capacity.

"Basic model" of federally regulated small, large, and very large water source heat pump means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparable compressors, same or comparable heat exchangers, and same or comparable "nominal" capacity.

"Basic model" of federally regulated variable refrigerant flow systems means all units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s) that have a common "nominal" cooling capacity and the same heat rejection medium (e.g., air or water) (includes VRF water source heat pumps).

"Blower coil indoor unit" means an indoor unit either with an indoor blower housed with the coil or with a separate designated air mover such as a furnace or a modular blower (as defined in 10 C.F.R. part 430 Appendix AA to subpart B).

"Blower coil system" refers to a split system that includes one or more blower coil indoor units.

"Casement-only ~~room air conditioner~~" means a room air conditioner ~~with an encased assembly~~ designed for mounting in a casement window with an encased assembly with a width of 14.8 inches or less and a height of 11.2 inches or less.

"Casement-slider ~~room air conditioner~~" means a room air conditioner with an encased assembly designed for mounting in a sliding or casement window with a width of 15.5 inches or less.

"Casement window" means a window that opens on hinges at the side.

"Central air conditioner" that is a federally regulated consumer product means a product, other than a packaged terminal air conditioner or packaged terminal heat pump, which is powered by single phase electric current, air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a cooling unit only. A central air conditioner may consist of: a single-package unit; an outdoor unit and one or more indoor units; an indoor unit only; or an outdoor unit with no match. In the case of an indoor unit only or an outdoor unit with no match, the unit must be tested and rated as a system (combination of both an indoor and an outdoor unit) ~~an air conditioner that is capable of cooling only by refrigeration and is not a room air conditioner or a packaged terminal air conditioner~~.

"Central air-conditioning heat pump" that is a federally regulated consumer product means a product, other than a packaged terminal air conditioner or packaged terminal heat pump, which is powered by single phase electric current, air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling unit only. A central air conditioner or central air conditioning heat pump may consist of: a single-package unit; an outdoor unit and one or more indoor units; an indoor unit only; or an outdoor unit with no match. In the case of an indoor unit only or an outdoor unit with no match, the unit must be tested and rated as a system (combination of both an indoor and an outdoor unit) ~~central air conditioner that is capable of cooling and heating by refrigeration~~.

"Coefficient of Performance (COP)" of federally regulated consumer products means the ratio of the average rate of space heating delivered to the average rate of electrical energy consumed by the heat pump. These rate quantities must be determined from a single test or, if derived via interpolation, must be determined at a single set of operating conditions. COP is a dimensionless quantity. When determined for a ducted coil-only system, COP must include sections 3.7 and 3.9.1 of 10 C.F.R. section 430.23(m) (Appendix M to subpart B of part 430): default values for the heat output and power input of a fan motor.

"Coefficient of ~~p~~Performance (COP)" of federally regulated commercial and industrial equipment means the ratio of the produced cooling effect of an air conditioner or heat pump (or its produced heating effect, depending on the mode of operation) to its net work input, when both the cooling (or heating) effect and the net work input are expressed in identical units of measurement, as determined using the applicable test method in ~~S~~section 1604(b) or 1604(c) of this Article.

"Commercial package air-conditioning and heating equipment" means federally regulated air-cooled, water-cooled, evaporatively cooled, or water source (not including ground water source) electrically operated, unitary central air conditioners and central air-conditioning heat pumps for commercial application.

"Coil-only indoor unit" means an indoor unit that is distributed in commerce without an indoor blower or separate designated air mover. A coil-only indoor unit installed in the field relies on a separately installed furnace or a modular blower for indoor air movement. Coil-only system refers to a system that includes only (one or more) coil-only indoor units.

~~"Compressor motor nominal horsepower" means the horsepower of a compressor motor as listed on the compressor motor's nameplate.~~

"Compressor power" of a packaged terminal air conditioner or packaged terminal air-conditioning heat pump means the rate of electrical consumption of a compressor, in watts.

"Computer room air conditioner" means a basic model of commercial package air-conditioning and heating equipment (packaged or split) that is:
(1) used in computer rooms, data processing rooms, or other information technology cooling applications;
(2) rated for sensible coefficient of performance (SCOP) and tested in accordance with 10 C.F.R. section 431.96, and
(3) not a covered consumer product under 42 U.S.C. sections 6291(1)–(2) and 6292.

A computer room air conditioner may be provided with, or have as available options, an integrated humidifier, temperature, and/or humidity control of the supplied air, and reheating function.

"Cooling capacity" means a measure of the ability of an air conditioner to remove heat from an enclosed space, as determined using the applicable test method in ~~S~~section 1604(b) or 1604(c) of this Article.

~~"db" means dry bulb.~~

"Double-duct air conditioner or heat pump" means federally regulated air-cooled commercial package air conditioning and heating equipment that:
(1) is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split;
(2) is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, as evidenced by the unit and/or all of its components being non-weatherized, including the absence of any marking (or listing) indicating compliance with UL 1995, "Heating and Cooling Equipment," or any other equivalent requirements for outdoor use;
(3) if it is:
    (A) a horizontal unit, a complete unit has a maximum height of 35 inches;
    (B) a vertical unit, a complete unit has a maximum depth of 35 inches; and
(4) has a rated cooling capacity greater than or equal to 65,000 Btu/hour and up to 300,000 Btu/hour.

"Ducted system" of a federally regulated consumer product means an air conditioner or heat pump that is designed to be permanently installed equipment and delivers conditioned air to the indoor space through a duct(s). The air conditioner or heat pump may be either a split-system or a single-package unit.

"Dust holding capacity" of an air filter 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.

"Energy ~~e~~Efficiency ~~r~~Ratio (EER)" means the ratio of the ~~produced~~ average rate of space cooling ~~effect of an~~delivered to the average rate of electrical energy consumed by the central air conditioner or heat pump. These rate quantities must be determined from a single test or, if derived via interpolation, must be determined at a single set of operating conditions. EER is ~~to its net work input,~~ expressed in units of Btu/watt-hour, as determined using the applicable test method in ~~S~~section ~~1604(b) or~~ 1604(c) of this Article. When determined for a ducted coil-only central system, EER must include the section 3.3 and 3.5.1 default values for the heat output and power input of a fan motor found in 10 C.F.R. section 430.23(m) (Appendix M to subpart B of part 430).

"Energy Efficiency Ratio (EER)" of federally regulated commercial and industrial equipment means the ratio of the produced cooling effect of an air conditioner or heat pump to its net work input, expressed in Btu/watt-hour.

"Evaporatively- cooled air conditioner" means an air conditioner whose refrigerating system has an evaporatively- cooled condenser.

"Face area" of an air filter means the gross area of the air filter exposed to airflow, as measured in a plane perpendicular to the direction of the airflow approaching the air filter (air filter length multiplied by air filter width), expressed in square-feet.

"Face velocity" of an air filter means the rate of air movement at the face of the air filter (airflow rate divided by face area) expressed in feet-per-minute.

"Final resistance" of an air filter means the resistance to airflow of the air filter operating at the point where the test is terminated and results determined.

"Gas-fired air-conditioner" means an air conditioner which utilizes gas as the primary fuel.

"Gas-fired heat pump" means a heat pump which utilizes gas as the primary fuel.

"Ground source closed-loop heat pump" means an appliance that:
(1) consists of one or more factory-made assemblies;
(2) includes an indoor conditioning coil with air moving means, a compressor, and a refrigerant-to-ground heat exchanger; and
(3) provides heating, cooling, or heating and cooling functions.

"Ground water-source heat pump" means an appliance that:
(1) consists of one or more factory-made assemblies;
(2) includes an indoor conditioning coil with air moving means, a compressor, and a refrigerant-to-water heat exchanger; and
(3) provides heating, cooling, or heating and cooling functions.

"Heat pump" that is a federally regulated consumer product means a type of central air conditioner ~~an appliance, other than a packaged terminal heat pump, that consists of one or more assemblies;~~ that ~~uses~~utilizes an indoor conditioning coil, ~~a~~ compressor, and ~~a~~ refrigerant-to-outdoor air heat exchanger to provide air heating; and ~~that~~ may also provide air cooling, air dehumidifying, air humidifying, air circulating, ~~or~~and air cleaning.

"Heat pump water-~~chilling~~heating 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.

"Heat recovery" (in the context of ~~a~~ variable refrigerant flow multi-split air conditioners or ~~a~~ variable refrigerant flow multi-split heat pumps) means that the air conditioner or heat pump is also capable of providing simultaneous heating and cooling operation, where recovered energy from the indoor units operating in one mode can be transferred to one or more other indoor units operating in the other mode. A variable refrigerant flow multi-split heat recovery heat pump is a variable refrigerant flow multi-split heat pump with the addition of heat recovery capability.

"Heating ~~s~~Seasonal ~~p~~Performance ~~f~~Factor (HSPF)" of a federally regulated consumer product means the total space heating required during the ~~space~~ heating season, expressed in Btu's, ~~and~~ divided by the total electrical energy consumed by the heat pump system during the same season, expressed in watt-hours, as determined using the applicable test method in ~~S~~section 1604(c) of this Article. The HSPF used to evaluate compliance with 10 C.F.R. 430.32(c) is based on Region IV, the minimum standardized design heating requirement, and the sampling plan stated in 10 C.F.R. 429.16(a).

"Heating Seasonal Performance Factor (HSPF)" of federally regulated commercial and industrial equipment means the total heating output of a central air-conditioning heat pump during its normal annual usage period for heating, expressed in Btu's and divided by the total electric power input, expressed in watt-hours, during the same period.

"Indoor fan electrical input" means the electrical input required for the operation of an indoor fan, in watts.

"Indoor fan motor nominal horsepower" means the horsepower of an indoor fan motor as listed on the fan motor's nameplate.

"Indoor fan motor type" means the internal construction design of a motor.

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

"Integrated Energy Efficiency Ratio (IEER)" of federally regulated commercial equipment means a weighted average calculation of mechanical cooling EERs determined for four load levels and corresponding rating conditions, as measured in 10 C.F.R part 431, Appendix A of subpart F, expressed in Btu/watt-hour.

~~"Integrated part load value (IPLV)" means part load efficiency, as determined using the applicable test method in Section 1604(c).~~

"Large commercial package air-conditioning and heating equipment" means federally regulated commercial package air-conditioning and heating equipment that is rated:
(1) at or above 135,000 Btu per hour; and
(2) below 240,000 Btu per hour (cooling capacity).

"Maximum rated airflow rate" of an air filter means the highest airflow rate at which the air filter is operated, as published by the manufacturer.

"Minimum efficiency reporting value (MERV)" of an air filter means the composite particle efficiency metric defined in ASHRAE 52.2-2012.

"Multi-head mini-split system" means a split system that has one outdoor unit and that has two or more indoor units connected with a single refrigeration circuit. The indoor units operate in unison in response to a single indoor thermostat.

"Multiple-circuit (or multi-circuit) system" means a split system that has one outdoor unit and that has two or more indoor units installed on two or more refrigeration circuits such that each refrigeration circuit serves a compressor and one and only one indoor unit, and refrigerant is not shared from circuit to circuit.

"Multiple-split (or multi-split) system" means a split system that has one outdoor unit and two or more coil-only indoor units and/or blower coil indoor units connected with a single refrigerant circuit. The indoor units operate independently and can condition multiple zones in response to at least two indoor thermostats or temperature sensors. The outdoor unit operates in response to independent operation of the indoor units based on control input of multiple indoor thermostats or temperature sensors, and/or based on refrigeration circuit sensor input (e.g., suction pressure).

"Non-standard size" means a packaged terminal air conditioner or packaged terminal heat pump with existing wall sleeve dimensions having an external wall opening of less than 16 inches high or less than 42 inches wide, and a cross-sectional area less than 670 square inches.

"Outdoor fan electrical input" means the electrical input required for the operation of an outdoor fan, in watts.

"Outdoor fan motor nominal horsepower" means the horsepower of an outdoor fan motor as listed on the fan motor's nameplate.

"Packaged terminal air conditioner" means a wall sleeve and a separate un-encased combination of heating and cooling assemblies specified by the builder and intended for mounting through the wall and that is industrial equipment. It includes a prime source of refrigeration, separable outdoor louvers, forced ventilation, and heating availability by builder's choice of hot water, steam, or electricity.

"Packaged terminal heat pump" means a packaged terminal air conditioner that utilizes reverse cycle refrigeration as its prime heat source, that has a supplementary heating source available, with the choice of hot water, steam, or electric resistant heat, and that is industrial equipment.

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

"Particle size efficiency" of an air filter 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 (μm). Particle size efficiency abbreviated as "PSE" in the required labels for air filters.

"Premium motor" means a premium motor as defined in NEMA Premium™: Product Scope and Nominal Efficiency Levels (2001).

"Pressure drop" of an air filter means the drop in static pressure versus air flow rate across air filter media in the forced-air heating or cooling equipment.

~~"Room air conditioner" means a factory-encased air conditioner that is designed~~
~~(1) as a unit for mounting in a window, through a wall, or as a console, and~~
~~(2) for delivery without ducts of conditioned air to an enclosed space.~~

"Room air conditioner" means a federally regulated consumer product, other than a "packaged terminal air conditioner," which is powered by a single phase electric current and which is an encased assembly designed as a unit for mounting in a window or through the wall for the purpose of providing delivery of conditioned air to an enclosed space. It includes a prime source of refrigeration and may include a means for ventilating and heating.

~~"Room air-conditioning heat pump" means a room air conditioner that is capable of heating by refrigeration.~~

"Seasonal ~~e~~Energy ~~e~~Efficiency ~~r~~Ratio (SEER)" of a federally regulated consumer product means the total heat removed from the conditioned space during the annual cooling season, expressed in Btu's, divided by the total

electrical energy consumed by the central air conditioner or heat pump during the same season, expressed in watt-hours, as determined using the applicable test method in ~~S~~section 1604(c) of this Article.

"Seasonal Energy Efficiency Ratio (SEER)" of federally regulated commercial and industrial equipment means the total cooling output of a central air conditioner or central air-conditioning heat pump, expressed in Btu's, during its normal annual usage period for cooling and divided by the total electric power input, expressed in watt-hours, during the same period.

"Sensible coefficient of performance" (SCOP) means the net sensible cooling capacity in watts divided by the total power input in watts (excluding reheaters and humidifiers).

"Single package central air conditioner" means a central air conditioner in which all the major assemblies are enclosed in one cabinet.

"Single package heat pump" means a heat pump in which all the major assemblies are enclosed in one cabinet.

"Single package vertical air conditioner" means air-cooled commercial package air conditioning and heating equipment that:
(1) is factory-assembled as a single package that:
  (A) has major components that are arranged vertically;
  (B) is an encased combination of cooling and optional heating components; and
  (C) is intended for exterior mounting on, adjacent interior to, or through an outside wall;
(2) is powered by a single- or three-phase current;
(3) may contain one or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum, or sleeves; and
(4) has heating components that may include electrical resistance, steam, hot water, or gas, but may not include reverse cycle refrigeration as a heating means.

"Single package vertical heat pump" means a single package vertical air conditioner that:
(1) uses reverse cycle refrigeration as its primary heat source; and
(2) may include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas.

"Small commercial package air-conditioning and heating equipment" means federally regulated commercial package air-conditioning and heating equipment that is rated below 135,000 Btu per hour (cooling capacity).

"Small duct, high velocity system" (SDHV) means a ~~heating and cooling product that contains a blower and indoor coil combination that:~~
~~(1) is designed for, and produces,~~ split system for which all indoor units are blower coil indoor units that produce at least 1.2 inches (of water column) of external static pressure when operated at the ~~certified~~ full-load air volume rate certified by the manufacturer of at least 220-~~350~~ scfm per rated ton of cooling~~; and~~
~~(2) when applied in the field, uses high velocity room outlets generally greater than 1000 fpm which have less than 6.0 square inches of free area~~.

"Space constrained product" means a central air conditioner or heat pump:
(1) that has rated cooling capacities no greater than 30,000 BTU/hr;
(2) that has an outdoor or indoor unit having at least two overall exterior dimensions or an overall displacement that:
  (A) are (is) substantially smaller than those of other units that are:
    1. currently installed in site-built single family homes, and
    2. of a similar cooling, and, if a heat pump, heating, capacity, and
  (B) if increased, would certainly result in a considerable increase in the usual cost of installation or would certainly result in a significant loss in the utility of the product to the consumer; and
(3) of a product type that was available for purchase in the United States as of December 1, 2000.

"Split system" of a consumer product means any air conditioner or heat pump that has at least two separate assemblies that are connected with refrigerant piping when installed. One of these assemblies includes an

indoor coil that exchanges heat with the indoor air to provide heating or cooling, while one of the others includes an outdoor coil that exchanges heat with the outdoor air. Split systems may be either blower coil systems or coil-only systems.

~~"Split system central air conditioner" means a central air conditioner in which one or more of the major assemblies are separate from the others.~~

~~"Split system heat pump" means a unitary heat pump in which one or more of the major assemblies are separate from the others in a central air conditioner or a central air conditioning heat pump.~~

"Split system" of commercial and industrial equipment means any central air conditioner or central air conditioning heat pump in which one or more of the major assemblies are separate from the others.

"Standard motor" in a central air conditioner or a central air-conditioning heat pump means a motor that is not a premium motor.

"Standard size" means a packaged terminal air conditioner or packaged terminal heat pump with wall sleeve dimensions having an external wall opening of greater than or equal to 16 inches high or greater than or equal to 42 inches wide, and a cross-sectional area greater than or equal to 670 square inches.

"Thermostatic expansion valve (TXV)" means a refrigerant metering valve, installed in an air conditioner or heat pump, which controls the flow of liquid refrigerant entering the evaporator in response to the super heat of the gas leaving it.

~~"Through-the-wall air conditioner and heat pump" means a central air conditioner or heat pump that is designed to be installed totally or partially within a fixed-size opening in an exterior wall, and:~~
~~(1) is manufactured prior to January 23, 2010;~~
~~(2) is not weatherized;~~
~~(3) is clearly and permanently marked for installation only through an exterior wall;~~
~~(4) has a rated cooling capacity no greater than 30,000 Btu/hr;~~
~~(5) exchanges all of its outdoor air across a single surface of the equipment cabinet; and~~
~~(6) has a combined outdoor air exchange area of less than 800 square inches (split systems) or less than 1,210 square inches (single packaged systems) as measured on the surface described in paragraph (5) of this definition.~~

"Through-the-wall central air conditioner" means a central air conditioner that is designed to be installed totally or partially within a fixed-size opening in an exterior wall, and:
(1) is not weatherized;
(2) is clearly and permanently marked for installation only through an exterior wall;
(3) has a rated cooling capacity no greater than 30,000 Btu/hr;
(4) exchanges all of its outdoor air across a single surface of the equipment cabinet; and
(5) has a combined outdoor air exchange area of less than 800 square inches (split systems) or less than 1,210 square inches (single packaged systems) as measured on the surface described in paragraph (4) of this definition.

"Through-the-wall central air conditioning heat pump" means a heat pump that is designed to be installed totally or partially within a fixed-size opening in an exterior wall, and:
(1) is not weatherized;
(2) is clearly and permanently marked for installation only through an exterior wall;
(3) has a rated cooling capacity no greater than 30,000 Btu/hr;
(4) exchanges all of its outdoor air across a single surface of the equipment cabinet; and
(5) has a combined outdoor air exchange area of less than 800 square inches (split systems) or less than 1,210 square inches (single packaged systems) as measured on the surface described in paragraph (4) of this definition.

"Unitary air conditioner" means a central air conditioner consisting of one or more factory-made assemblies that include an evaporator or cooling coil and an electrically- driven compressor and condenser combination.

"Unitary heat pump" means a central air conditioning heat pump that consists of one or more factory-made assemblies, including an indoor conditioning coil, a compressor, and an outdoor coil, that provides a heating function, and that may provide a cooling function.

"Variable refrigerant flow (VRF) multi-split air conditioner" means a unit of commercial package air-conditioning and heating equipment that is configured as a split system air conditioner incorporating a single refrigerant circuit, with one or more outdoor units, at least one variable speed compressor or an alternate compressor combination for varying the capacity of the system by three or more steps, and multiple indoor fan coil units, each of which is individually metered and individually controlled by an integral control device and common communications network and which can operate independently in response to multiple indoor thermostats. Variable refrigerant flow implies three or more steps of capacity control on common, inter-connecting piping.

"Variable refrigerant flow (VRF) multi-split heat pump" means a unit of commercial package air-conditioning and heating equipment that is configured as a split system heat pump that uses reverse cycle refrigeration as its primary heating source and which may include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas. The equipment incorporates a single refrigerant circuit, with one or more outdoor units, at least one variable-speed compressor or an alternate compressor combination for varying the capacity of the system by three or more steps, and multiple indoor fan coil units, each of which is individually metered and individually controlled by a control device and common communications network and which can operate independently in response to multiple indoor thermostats. Variable refrigerant flow implies three or more steps of capacity control on common, inter-connecting piping.

"Variable refrigerant flow (VRF) system" that is a federally regulated consumer product means a multi-split system with at least three compressor capacity stages, distributing refrigerant through a piping network to multiple indoor blower coil units each capable of individual zone temperature control, through proprietary zone temperature control devices and a common communications network. Note: Single-phase VRF systems less than 65,000 Btu/h are central air conditioners and central air conditioning heat pumps.

"Very large commercial package air-conditioning and heating equipment" means commercial package air-conditioning and heating equipment that is rated:
(1) at or above 240,000 Btu per hour; and
(2) below 760,000 Btu per hour (cooling capacity).

"Water-cooled air conditioner" means an air conditioner whose refrigerating system has a water-cooled condenser.

"Water-source heat pump" means a single-phase or three-phase reverse-cycle heat pump that uses a circulating water loop as the heat source for heating and as the heat sink for cooling. The main components are a compressor, refrigerant-to-water heat exchanger, refrigerant-to-air heat exchanger, refrigerant expansion devices, refrigerant reversing valve, and indoor fan. Such equipment includes, but is not limited to, water-to-air water-loop heat pumps.~~an appliance that~~
~~(1) consists of one or more factory-made assemblies;~~
~~(2) includes an indoor conditioning coil, a compressor, and a refrigerant-to-water heat exchanger; and~~
~~(3) provides heating and cooling functions.~~

~~"wb" means wet bulb.~~

"Year-round air conditioner" means an appliance that contains an air conditioner and a furnace in the same cabinet.

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

"Airflow" of ceiling fans means the rate of air movement at a specific fan-speed setting expressed in cfm.

~~"Airflow efficiency" means the ratio of airflow divided by power at a specific ceiling fan speed setting expressed in cfm/watt.~~

"Basic model" of a federally regulated residential furnace fan, as defined in 10 C.F.R. section 430.2, means all units of a given type of residential furnace fan (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; and that are marketed and/or designed to be installed in the same type of installation.

"Belt-driven ceiling fan" means a ceiling fan with a series of one or more fan heads, each driven by a belt connected to one or more motors that are located outside of the fan head.

"Blade span" means the diameter of the largest circle swept by any part of the fan blade assembly, including any blade attachments.

"Ceiling fan" means a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades.

"Ceiling fan efficiency" means the ratio of the total airflow to the total power consumption, in units of ft^3 per minute per watt (CFM/W).

"Ceiling fan light kit" means equipment designed to provide light from a ceiling fan that can be:
(1) integral, such that the equipment is attached to the ceiling fan prior to the time of retail sale; or
(2) attachable, such that at the time of retail sale the equipment is not physically attached to the ceiling fan, but may be included inside the ceiling fan at the time of sale or sold separately for subsequent attachment to the fan.

"Centrifugal ceiling fan" means a ceiling fan for which the primary airflow direction is in the same plane as the rotation of the fan blades.

"Combined energy efficiency ratio" is the energy efficiency of a portable air conditioner in Btu per watt-hours (Btu/Wh).

"Cooling efficiency ratio (CER)" means the efficiency of a spot air conditioner obtained by dividing the sum of the cooling capacity and the fan electrical input, both in Btu per hour by the total electrical input in watts, all as determined using the test method specified in Section 1604(d).

"Dehumidifier" means a product, other than a portable air conditioner, room air conditioner, or packaged terminal air conditioner, that is a self-contained, electrically operated, and mechanically encased assembly consisting of:
(1) a refrigerated surface (evaporator) that condenses moisture from the atmosphere;
(2) a refrigerating system, including an electric motor;
(3) an air-circulating fan; and
(4) a means for collecting or disposing of the condensate.

"Direct evaporative cooler" means a heat and mass transfer device used to adiabatically cool air passing through the device by the process of evaporating water directly exposed to this air.

"Dual-duct portable air conditioner" means a portable air conditioner that draws some or all of the condenser inlet air from outside the conditioned space through a duct attached to an adjustable window bracket, may draw additional condenser inlet air from the conditioned space, and discharges the condenser outlet air outside the conditioned space by means of a separate duct attached to an adjustable window bracket.

"Energy factor for dehumidifiers" means a measure of energy efficiency of a dehumidifier calculated by dividing the water removed from the air by the energy consumed, measured in liters per kWh (l/kWh).

"Evaporative cooler" means an appliance that cools indoor air directly or indirectly by evaporation of water. "Evaporative Cooler" does not include portable or spot evaporative coolers.

"Evaporative cooler efficiency ratio (ECER)" means a measure of the cooling efficiency defined in Table D-~~1~~3 of ~~S~~section 1604(d) of this Article.

"Furnace fan" means an electrically powered device used in a consumer product for the purpose of circulating air through ductwork.

"High speed" of a ceiling fan means the highest available ceiling fan speed, *i.e.*, the fan speed corresponding to the maximum blade revolutions per minute (RPM).

"High-speed small-diameter (HSSD) ceiling fan" means a small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly decorative ceiling fan or belt-driven ceiling fan and that has a blade thickness of less than 3.2 mm at the edge or a maximum tip speed greater than the applicable limit specified in Table D-1.

Table D-1
High-Speed Small-Diameter Ceiling Fan Blade and Tip Speed Criteria

Airflow Direction	***Thickness (t) of Edges of Blades***		***Tip Speed Threshold***	
	Mm	***Inch***	***m/s***	***Feet per minute***
Downward only	4.8 > t ≥ 3.2	$^{3}/_{16}$ > t ≥ ⅛	16.3	3,200
Downward only	t ≥ 4.8	t ≥ $^{3}/_{16}$	20.3	4,000
Reversible	4.8 > t ≥ 3.2	3/16 > t ≥ ⅛	12.2	2,400
Reversible	t ≥ 4.8	t ≥ $^{3}/_{16}$	16.3	3,200

"Highly decorative ceiling fan" means a ceiling fan with a maximum rotational speed of 90 RPM and less than 1,840 CFM airflow at high speed, as determined by sections 3 and 4 of 10 C.F.R. section 430.23(w) (Appendix U to Subpart B of part 430).

"Hugger ceiling fan" means a low-speed small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly decorative ceiling fan or belt-driven ceiling fan; for which the lowest point on the fan blades is less than or equal to 10 inches from the ceiling.

"Indirect evaporative cooler" means a heat and mass transfer device used to sensibly cool a primary airstream, without addition of moisture, by means of an evaporatively cooled secondary airstream.

"Input power" of a ceiling fan light kit means the actual total power used by all lamp(s) and ballast(s) of the ceiling fan light kit during operation, expressed in watts and measured using the lamp and ballast packaged with the kit.

"Lamp ballast platform" of a ceiling fan light kit means a pairing of one ballast with one or more lamps that can operate simultaneously on that ballast. A unique platform is defined by the manufacturer and model number of the ballast and lamp(s) and the quantity of lamps that operate on the ballast.

"Lamp lumens" of a ceiling fan light kit means a measurement of luminous flux expressed in lumens and measured using the lamp and ballast shipped with the fixture.

"Large-diameter ceiling fan" means a ceiling fan that is greater than seven feet in diameter.

"Low-profile ceiling fan" means a ceiling fan where the motor mounts directly to the ceiling and that cannot be mounted using a down-rod.

"Low speed" of a ceiling fan means the lowest available ceiling fan speed, i.e., the fan speed corresponding to the minimum, non-zero, blade RPM.

"Low-speed small-diameter (LSSD) ceiling fan" means a small-diameter ceiling fan that has a blade thickness greater than or equal to 3.2 mm at the edge and a maximum tip speed less than or equal to the applicable limit specified in Table D-2.

Table D-2
Low-Speed Small-Diameter Ceiling Fan Blade and Tip Speed Criteria

Airflow Direction	*Thickness (t) of Edges of Blades*		*Tip speed threshold*	
	Mm	*Inch*	*m/s*	*Feet per minute*
Reversible	4.8 > t ≥ 3.2	$^{3}/_{16}$ > t ≥ ⅛	12.2	2,400
Reversible	t ≥ 4.8	t ≥ $^{3}/_{16}$	16.3	3,200

"Multi-head ceiling fan" means a ceiling fan with more than one fan head, i.e., more than one set of rotating fan blades.

"Multi-mount ceiling fan" means a low-speed small-diameter ceiling fan that can be mounted in the configurations associated with both the standard and hugger ceiling fans.

"Oscillating ceiling fan" means a ceiling fan containing one or more fan heads for which the axis of rotation of the fan blades cannot remain in a fixed position relative to the ceiling. Such fans have no inherent means by which to disable the oscillating function separate from the fan blade rotation.

"Packaged direct evaporative cooler" means a direct evaporative cooler with an air-moving device that includes the entire water distribution, collection, and recirculation system with pump and piping. "Packaged direct evaporative cooler" does not include portable or spot evaporative coolers.

"Packaged indirect evaporative cooler" means an indirect evaporative cooler with integrated or nonintegrated primary and secondary air passages and provided with both primary and secondary air-moving devices. This device also includes the entire water distribution, collection, and recirculation system with pump and piping.

"Packaged indirect/direct evaporative cooler" means a product incorporating both an indirect evaporative cooler and a direct evaporative cooler, and including the entire water distribution, collection, and recirculation system with pump and piping.

"Portable air conditioner" means a portable encased assembly, other than a "packaged terminal air conditioner," "room air conditioner," or "dehumidifier," that delivers cooled, conditioned air to an enclosed space, and is powered by single-phase electric current. It includes a source of refrigeration and may include additional means for air circulation and heating. A portable air conditioner is typically mounted on wheels for moving from place to place within a building or structure.

"Portable dehumidifier" means a dehumidifier designed to operate within the dehumidified space without the attachment of additional ducting, although means may be provided for optional duct attachment.

"Portable or Spot Evaporative Cooler" means an evaporative cooler that is non-ducted, not designed for permanent installation, and can be plugged into a standard mains outlet.

"Product capacity for dehumidifiers" means a measure of the ability of a dehumidifier to remove moisture from its surrounding atmosphere, measured in pints collected per 24 hours of continuous operation.

"Residential exhaust fan" means a permanently installed bathroom, kitchen, or utility room ceiling or wall-mounted exhaust fan. "Residential exhaust fan" does not include the exhaust fans included in microwave/oven hood combination units.

"Seasonally adjusted cooling capacity" means the amount of cooling, measured in Btu/h, provided to the indoor conditioned space, measured under the specified ambient conditions.

"Single-duct portable air conditioner" means a portable air conditioner that draws all of the condenser inlet air from the conditioned space without the means of a duct, and discharges the condenser outlet air outside the conditioned space through a single duct attached to an adjustable window bracket.

"Small-diameter ceiling fan" means a ceiling fan that is less than or equal to seven feet in diameter.

"Spot air conditioner" means an air conditioner that discharges cool air into a space and discharges rejected heat back into that space, where there is no physical boundary separating the discharges. Spot air conditioners are considered a subset of portable air conditioners.

"Standard ceiling fan" means a low-speed small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly decorative ceiling fan or belt-driven ceiling fan; for which the lowest point on fan blades is greater than 10 inches from the ceiling.

"System efficacy per lamp ballast platform" of a ceiling fan light kit means the ratio of measured lamp lumens expressed in lumens and measured input power expressed in watts.

"Total airflow" of a ceiling fan means the sum of the product of airflow and hours of operation at all tested speeds. For multi-head fans, this includes the airflow from all fan heads.

"Very small-diameter (VSD) ceiling fan" means a small-diameter ceiling fan that is not a highly decorative ceiling fan or belt-driven ceiling fan; and has one or more fan heads, each of which has a blade span of 18 inches or less.

"Whole-home dehumidifier" means a dehumidifier designed to be installed with ducting to deliver return process air to its inlet and to supply dehumidified process air from its outlet to one or more locations in the dehumidified space.

"Whole house fan" means an exhaust fan that is mounted in the ceiling of a residence that is capable of moving 1,000 cfm or more, and that provides cooling or fresh air.

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

"Annual fuel utilization efficiency (AFUE)" means the efficiency descriptor for furnaces and boilers, as determined using the applicable test method in ~~S~~section 1604(e) of this Article and based on the assumption that all:

(1) weatherized warm air furnaces or boilers are located out-of-doors;
(2) warm air furnaces which are not weatherized are located indoors and all combustion and ventilation air is admitted through grill or ducts from the outdoors and does not communicate with air in the conditioned space;
(3) boilers which are not weatherized are located within the heated space.

"Automatic flue damper" means a device installed in the flue outlet or in the inlet of or upstream of the draft control device of an individual, automatically operated, fossil fuel-fired appliance that is designed to automatically open the flue outlet during appliance operation and to automatically close the flue outlet when the appliance is in a standby condition.

"Automatic vent damper" means a device intended for installation in the venting system of an individual, automatically operated, fossil fuel-fired appliance either in the outlet or downstream of the appliance draft control device, which is designed to automatically open the venting system when the appliance is in operation and to automatically close off the venting system when the appliance is in a standby or shutdown condition.

"Basic model" of federally regulated commercial packaged boilers means all commercial packaged boilers manufactured by one manufacturer within a single equipment class having the same primary energy source (e.g., gas or oil) and that have essentially identical electrical, physical, and functional characteristics that affect energy efficiency.

"Basic model" of federally regulated commercial warm air furnaces means all commercial warm air furnaces manufactured by one manufacturer within a single equipment class, that have the same nominal input rating

and the same primary energy source (e.g. gas or oil) and that do not have any differing physical or functional characteristics that affect energy efficiency.

"Boiler" means a space heater that is a self-contained appliance for supplying steam or hot water primarily intended for space-heating. "Boiler" does not include hot water supply boilers.

"Central furnace" means a self-contained space heater designed to supply heated air through ducts of more than 10 inches length.

"Combination space-heating and water-heating appliance" means an appliance that is designed to provide both space heating and water heating from a single primary energy source.

"Combined annual efficiency (CAE)" means [(SHF x $Effy_{hs}$ /100) + (WHF x $Effy_{ss}$ /100) + (R x NHF x EF)] divided by [SHF + WHF + (R x NHF)] as defined in the applicable test method in ~~S~~section 1604(e)(3) of this Article.

"Combustion efficiency of a space heater" means a measure of the percentage of heat from the combustion of gas or oil that is transferred to the space being heated or lost as jacket loss, as determined using the applicable test method in ~~S~~section 1604(e) of this Article.

"Combustion efficiency for a commercial packaged boiler" means the efficiency descriptor for packaged boilers, determined using test procedures prescribed under 10 C.F.R. section 431.86 and is equal to 100 percent minus percent flue loss (percent flue loss is based on input fuel energy).

"Commercial packaged boiler" means a type of packaged low pressure boiler that is industrial equipment with a capacity (rated maximum input) of 300,000 Btu per hour (Btu/hr) or more which, to any significant extent, is distributed in commerce:
(1) For heating or space conditioning applications in buildings; or
(2) For service water heating in buildings but does not meet the definition of "hot water supply boiler" in this part.

"Condensing boiler" means a commercial packaged boiler that condenses part of the water vapor in the flue gases, and that includes a means of collecting and draining this condensate from its heat exchanger section.

"Direct vent system" means a system supplied by a manufacturer which provides outdoor air or air from an unheated space (such as an attic or crawl space) directly to a furnace or vented heater for combustion and for draft relief if the unit is equipped with a draft control device.

"Duct furnace" means a space heater designed to be installed within a duct.

"Energy consumption during standby" means the energy consumed by a gas or oil space heater when the main burner is not operating, not including energy consumption related to associated cooling equipment, and reported in watts, based on a conversion factor of 3.412 Btu per watt-hour.

"Fan type gas space heater" means a space heater in which heat is distributed to the surrounding area through the use of an electric fan.

"Floor furnace" means a self-contained, floor-mounted space heater without ducts.

"Floor-mounted unit heater" means a unit heater designed for mounting on the floor rather than suspension mounting.

"Gravity type gas space heater" means a gas space heater in which heat is distributed to the surrounding area as a result of the differences in densities of cooler and warmer air in the surrounding atmosphere.

"High intensity infrared heater" means an infrared gas space heater that has a radiating surface that operates at or above 1,350°F.

“High static unit heater” means a unit heater that has an integral means for the circulation of air against 0.2 inch or greater static pressure.

“Indoor duct furnace” means a duct furnace designed to operate under sheltered conditions.

“Infrared gas space heater” means a gas space heater that directs a substantial amount of its energy output in the form of infrared energy into the area to be heated.

“Low intensity infrared heater” means an infrared gas space heater that has a radiating surface that operates at less than 1,350°F.

“Low static unit heater” means a unit heater that has an integral means for the circulation of air against less than 0.2 inch static pressure.

“Mobile home furnace” means a direct vent furnace that is designed for use only in mobile homes.

“Non-packaged boiler” means a boiler that is not a packaged boiler.

“Outdoor duct furnace” means a duct furnace designed to function normally under varying outdoor weather conditions.

“Outdoor furnace or boiler” means a furnace or boiler normally intended for installation out-of-doors or in an unheated space (such as an attic or crawl space).

“Output” means the rate of useful heat output when operating under steady state conditions.

“Packaged boiler” means a boiler that is shipped complete with heating equipment, mechanical draft equipment, and automatic controls, usually shipped in one or more sections and does not include a boiler that is custom designed and field constructed. If the boiler is shipped in more than one section, the sections may be produced by more than one manufacturer, and may be originated or shipped at different times and from more than one location.

“Packaged high pressure boiler” means a packaged boiler that is:
(1) A steam boiler designed to operate at a steam pressure higher than 15 psi gauge (psig);
(2) A hot water boiler designed to operate at a water pressure above 160 psig or at a water temperature exceeding 250°F, or both; or
(3) A boiler that is designed to be capable of supplying either steam or hot water, and designed to operate under the conditions in paragraphs (1) and (2) of this definition.

“Packaged low pressure boiler” means a packaged boiler that is:
(1) A steam boiler designed to operate at or below a steam pressure of 15 psig;
(2) A hot water boiler designed to operate at or below a water pressure of 160 psig and a temperature of 250°F; or
(3) A boiler that is designed to be capable of supplying either steam or hot water, and designed to operate under the conditions in paragraphs (1) and (2) of this definition.

“Patio heater” means an infrared gas space heater that is designed for warming outdoor areas using radiant heat.

“Portable infrared heater” means a free-standing infrared gas space heater designed with the intent of being moved from one space to another.

“Power venting” means a venting system that uses a separate fan, either integral to the appliance or attached to the vent pipe, products of combustion.

“Premium motor” means a premium motor as defined in NEMA Premium™: Product Scope and Nominal Efficiency Levels (2001).

“Radiant coefficient” means a measure of efficiency of an infrared gas space heater, as determined using the applicable test method in ~~S~~section 1604(e) of this Article.

“Radiant tube-type infrared heater” means a low-intensity infrared gas space heater in which combustion takes place within a tube.

“Room heater” means a free-standing non-recessed space heater.

“Space heater” means an appliance that supplies heat to a space for the purpose of providing warmth to objects within the space. “Space heater” includes but is not limited to boilers (except hot water supply boilers), furnaces, room heaters, floor furnaces, wall furnaces, infrared heaters, unit heaters, duct furnaces, and combination space-heating and water-heating appliances.

“Standard motor” of a central gas furnace means a motor that is not a premium motor.

“Standby loss” of a boiler means the sum of the gas used by the pilot (converted to watts), the electricity used by controls, and any other energy used while the boiler is not operating.

“Steam boiler” means a boiler that supplies steam.

“Thermal efficiency” of a space heater means a measure of the percentage of heat from the combustion of gas or oil that is transferred to the space being heated, or in the case of a boiler, to the hot water or steam, as determined using the applicable test methods in ~~S~~section 1604(e) of this Article. Thermal efficiency of a commercial warm air furnace equals 100 percent minus percent flue loss, as determined using test procedures prescribed under 10 C.F.R. section 431.76.

“Unit heater” means a self-contained, automatically- controlled, vented fan-type gas space heater designed to be installed without ducts, within the heated space.

“Unvented gas space heater” means a gas space heater designed to be used without a vent.

“Unvented oil space heater” means an oil space heater designed to be used without a vent. Note: See Health and Safety Code ~~S~~section 19881 for restrictions on the sale of unvented gas space heaters and unvented oil space heaters.

“Vented floor furnace” means a self-contained vented heater suspended from the floor of the space being heated, taking air for combustion from outside this space. The vented floor furnace supplies heated air circulated by gravity or by a fan directly into the space to be heated through openings in the casing.

“Vented gas space heater” means a gas space heater designed to be used with a vent.

“Vented home heating equipment” or “vented heater” means a class of home heating equipment, not including furnaces, designed to furnish warmed air to the living space of a residence, directly from the device, without duct connections (except that boots not to exceed 10 inches beyond the casing may be permitted and includes: vented wall furnace, vented floor furnace, and vented room heater.

“Vented oil space heater” means an oil space heater designed to be used with a vent.

“Vented room heater” means a self-contained, free standing, non-recessed, vented heater for furnishing warmed air to the space in which it is installed. The vented room heater supplies heated air circulated by gravity or by a fan directly into the space to be heated through openings in the casing.

"Vented wall furnace" means a self-contained vented heater complete with grilles or the equivalent, designed for incorporation in, or permanent attachment to, a wall of a residence and furnishing heated air circulated by gravity or by a fan directly into the space to be heated through openings in the casing.

"Wall furnace" means a wall-mounted, self-contained space heater without ducts that exceed 10 inches.

"Water boiler" means a boiler that supplies hot water.

(f) Water Heaters.

"Activation lock" means a control mechanism (either by a physical device directly on the water heater or a control system integrated into the water heater) that is locked by default and contains a physical, software, or digital communication that must be activated with an activation key to enable to the product to operate at its designed specifications and capabilities and without which the activation of the product will provide not greater than 50 percent of the rated first hour delivery of hot water certified by the manufacturer.

"Air-source commercial heat pump water heater" means a commercial heat pump water heater that utilizes indoor or outdoor air as the heat source.

"Basic model" of federally regulated water heaters, hot water supply boilers, or unfired hot water storage tanks that are commercial and industrial equipment means all water heaters, hot water supply boilers, or unfired hot water storage tanks manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., gas or oil) and that have essentially identical electrical, physical and functional characteristics that affect energy efficiency.

"Booster water heater" means a water heater that raises the temperature of the preheated water supplied to the unit typically from 110°F-140°F to 180°F-195°F.

"Commercial heat pump water heater (CHPWH)" means a water heater (including all ancillary equipment such as fans, blowers, pumps, storage tanks, piping, and controls, as applicable) that uses a refrigeration cycle, such as vapor compression, to transfer heat from a low-temperature source to a higher-temperature sink for the purpose of heating potable water, and has a rated electric power input greater than 12 kW. Such equipment includes, but is not limited to, air-source heat pump water heaters, water-source heat pump water heaters, and direct geo-exchange heat pump water heaters.

"Direct geo-exchange commercial heat pump water heater" means a commercial heat pump water heater that utilizes the earth as a heat source and allows for direct exchange of heat between the earth and the refrigerant in the evaporator coils.

"Electric instantaneous water heater" that is a federally regulated consumer product means a water heater that uses electricity as the energy source, has a nameplate input rating of 12 kW or less, and contains no more than one gallon of water per 4,000 Btu per hour of input.

"Electric instantaneous water heater" that is federally regulated commercial and industrial equipment means a water heater that uses electricity as the energy source, and has a rated input both greater than 12 kW and not less than 4,000 Btu/h per gallon of stored water.

"Electric storage water heater" that is a federally regulated consumer product means a water heater that uses electricity as the energy source, has a nameplate input rating of 12 kW or less, and contains more than one gallon of water per 4,000 Btu per hour of input.

"Electric storage water heater" that is federally regulated commercial and industrial equipment means a water heater that uses electricity to heat and store water within the appliance at a thermostatically controlled temperature for delivery on demand, and has a rated input both greater than 12 kW and less than 4,000 Btu/hour per gallon of stored water.

~~"Energy input rate" of a booster water heater means the peak rate at which a booster water heater consumes energy expressed in Btu/hr or kW.~~

"First-hour rating" means an estimate of the maximum volume of "hot" water that a storage-type water heater can supply within an hour that begins with the water heater fully heated (i.e., with all thermostats satisfied). It is a function of both the storage volume and the recovery rate.

"Flow-activated instantaneous water heater" means an instantaneous water heater or hot water supply boiler that activates the burner or heating element only if heated water is drawn from the unit.

"Gas-fired instantaneous water heater" that is a federally regulated consumer product means a water heater that uses gas as the main energy source, has a nameplate input rating less than 200,000 Btu/h, and contains no more than one gallon of water per 4,000 Btu per hour of input.

Gas-fired instantaneous water heater" that is federally regulated commercial and industrial equipment means a water heater that uses gas as the main energy source, and has a rated input both greater than 200,000 Btu/h and not less than 4,000 Btu/h per gallon of stored water.

"Gas-fired storage water heater" that is a federally regulated consumer product means a water heater that uses gas as the main energy source, has a nameplate input rating of 75,000 Btu/h or less, and contains more than one gallon of water per 4,000 Btu per hour of input.

"Gas-fired storage water heater" that is federally regulated commercial and industrial equipment means a water heater that uses gas to heat and store water within the appliance at a thermostatically controlled temperature for delivery on demand, and has a rated input both greater than 75,000 Btu/hour and less than 4,000 Btu/hour per gallon of stored water.

"Grid-enabled water heater" means an electric resistance water heater that:
(1) has a rated storage tank volume of more than 75 gallons;
(2) is manufactured on or after April 16, 2015;
(3) is equipped at the point of manufacture with an activation lock and;
(4) bears a permanent label applied by the manufacturer that:
    (A) is made of material not adversely affected by water;
    (B) is attached by means of non-water-soluble adhesive; and
    (C) advises purchasers and end-users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial Narrow Bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."

"Ground-source closed-loop commercial heat pump water heater" means a commercial heat pump water heater that utilizes a fluid circulated through a closed piping loop as a medium to transfer heat from the ground to the refrigerant in the evaporator. The piping loop may be buried inside the ground in horizontal trenches or vertical bores, or submerged in a surface water body.

"Ground water-source commercial heat pump water heater" means a commercial heat pump water heater that utilizes ground water as the heat source.

~~"Heat pump water heater" means a device using the vapor compression cycle to transfer heat from a low-temperature source to a higher temperature sink for the purpose of heating water, including all necessary ancillary equipment, fans, blowers, pumps, storage tanks, piping, and controls.~~

"Heat trap" means a device which can be integrally connected or independently attached to the hot and/or cold water pipe connections of a water heater such that the device will develop a thermal or mechanical seal to minimize the recirculation of water due to thermal convection between the water heater tank and its connecting pipes.

"Hot water dispenser" means a small electric water heater that has a measured storage volume no greater than 1.0 gallon.

"Hot water supply boiler" means a packaged boiler that is industrial equipment and that:
(1) has an input rating from 300,000 Btu/hour to 12,500,000 Btu/hour and of at least 4,000 Btu/hour per gallon of stored water;
(2) is suitable for heating potable water; and
(3) meets either or both of the following conditions:
    (A) it has the temperature and pressure controls necessary for heating potable water for purposes other than space heating; or
    (B) the manufacturer's product literature, product markings, product marketing, or product installation and operation instructions indicate that the boilers intended uses include heating potable water for purposes other than space heating.

"Immersed heating element" means an electrically powered heating device which is designed to operate while totally immersed in water in such a manner that the heat generated by the device is imparted directly to the water.

"Indoor water-source commercial heat pump water heater" means a commercial heat pump water heater that utilizes indoor water as the heat source.

"Input" means rate of energy consumption.

"Instantaneous water heater" that is federally regulated commercial and industrial equipment means a water heater that uses gas, oil, or electricity, including:
(1) gas-fired instantaneous water heaters with a rated input both greater than 200,000 Btu/h and not less than 4,000 Btu/h per gallon of stored water;
(2) oil-fired instantaneous water heaters with a rated input both greater than 210,000 Btu/h and not less than 4,000 Btu/h per gallon of stored water; and
(3) electric instantaneous water heaters with a rated input both greater than 12 kW and not less than 4,000 Btu/h per gallon of stored water.~~has an input rating of at least 4,000 Btu per hour per gallon of stored water.~~

~~"Large water heater" means a water heater that is not a small water heater.~~

"Maximum gpm (L/min) rating" means the maximum gallons per minute (liters per minute) of hot water that can be supplied by an instantaneous water heater while maintaining a nominal temperature rise of ~~77°F (42.8°C)~~ 67°F (37.3°C) during steady state operation.

"Mini-tank electric water heater" means a small electric water heater that has a measured storage volume more than 1.0 gallon and a rated storage volume less than 20 gallons.

"Oil-fired instantaneous water heater" that is a federally regulated consumer product means a water heater that uses oil as the main energy source, has a nameplate input rating of 210,000 Btu/h or less, and contains no more than one gallon of water per 4,000 Btu per hour of input.

"Oil-fired instantaneous water heater" that is federally regulated commercial and industrial equipment means a water heater that uses oil as the main energy source, and has a rated input both greater than 210,000 Btu/h and not less than 4,000 Btu/h per gallon of stored water.

"Oil-fired storage water heater" that is a federally regulated consumer product means a water heater that uses oil as the main energy source, has a nameplate input rating of 105,000 Btu/h or less, and contains more than one gallon of water per 4,000 Btu per hour of input.

"Oil-fired storage water heater" that is federally regulated commercial and industrial equipment means a water heater that uses oil to heat and store water within the appliance at a thermostatically controlled

temperature for delivery on demand, and has a rated input both greater than 105,000 Btu/hour and less than 4,000 Btu/hour per gallon of stored water.

"R-value" means the thermal resistance of insulating material as determined using ASTM C177-13 or C518-15 and expressed in (°F·ft²·h/Btu).

"Rated storage volume" means the water storage capacity of a water heater, in gallons (liters), as ~~specified~~certified by the manufacturer.

"Recovery efficiency" of a water heater means the ratio of energy delivered to the water to the energy content of the fuel consumed by the water heater, as determined using the applicable test method in ~~S~~section 1604(f) of this Article.

"Residential-duty water heater" means any gas-fired storage, oil-fired storage, or electric instantaneous commercial water heater that meets the following conditions:
(1) for models requiring electricity, uses single-phase external power supply;
(2) is not designed to provide outlet hot water at temperatures greater than 180 °F; and
(3) does not meet any of the following criteria:

Table F-1
Water Heater Non-Residential Application Exclusions

Water Heater Type	***Indicator of non-residential application***
Gas-fired storage	Rated input > 105 kBTU/hour; rated storage volume > 120 gallons
Oil-fired storage	Rated input > 140 kBTU/hour; rated storage volume > 120 gallons
Electric Instantaneous	Rated input > 58.6 kW; rated storage volume > 2 gallons

~~"Small water heater" means a water heater that is a gas storage water heater with an input of 75,000 Btu per hour or less, an oil storage water heater with an input of 105,000 Btu per hour or less, an electric storage water heater with an input of 12 kW or less, a gas instantaneous water heater with an input of 200,000 Btu per hour or less, an oil instantaneous water heater with an input of 210,000 Btu per hour or less, an electric instantaneous water heater with an input of 12 kW or less, or a heat pump water heater rated at 24 amps or less.~~

~~"Storage water heater" means a water heater that heats and stores water within the appliance at a thermostatically controlled temperature for delivery on demand, and that has an input less than 4,000 Btu per hour per gallon of stored water.~~

"Storage water heater" means a water heater that is regulated under 10 C.F.R. section 431 and that uses gas, oil, or electricity to heat and store water within the appliance at a thermostatically controlled temperature for delivery on demand, including:
(1) gas-fired storage water heaters with a rated input both greater than 75,000 Btu/hour and less than 4,000 Btu/hour per gallon of stored water;
(2) oil-fired storage water heaters with a rated input both greater than 105,000 Btu/hour and less than 4,000 Btu/hour per gallon of stored water; and
(3) electric storage water heaters with a rated input both greater than 12 kW and less than 4,000 Btu/hour per gallon of stored water.

~~"Tabletop water heater" means a water heater in a rectangular box enclosure designed to slide into a kitchen countertop space with typical dimensions of 36 inches high, 25 inches deep, and 24 inches wide.~~

"Thermal efficiency" of an instantaneous water heater, a storage water heater, or a hot water supply boiler means the ratio of the heat transferred to the water flowing through the water heater to the amount of energy consumed by the water heater ~~a measure of the percentage of heat from the combustion of gas or oil that is transferred to the water, as determined using~~ as measured during the thermal efficiency test procedure prescribed in the applicable test method in ~~S~~section 1604(f) of this Article.

"Uniform energy factor" of a water heater that is a federally regulated consumer product means the measure of water heater overall efficiency.

"Water heater" that is a federally regulated water heater as defined in 10 C.F.R. section 430.2 means a product which utilizes oil, gas, or electricity to heat potable water for use outside the heater upon demand, including:
(1) Storage type units which heat and store water at a thermostatically controlled temperature, including gas storage water heaters with an input of 75,000 Btu per hour or less, oil storage water heaters with an input of 105,000 Btu per hour or less, and electric storage water heaters with an input of 12 kilowatts or less;
(2) Instantaneous type units which heat water but contain no more than one gallon of water per 4,000 Btu per hour of input, including gas instantaneous water heaters with an input of 200,000 Btu per hour or less, oil instantaneous water heaters with an input of 210,000 Btu per hour or less, and electric instantaneous water heaters with an input of 12 kilowatts or less; and
(3) Heat pump type units, with a maximum current rating of 24 amperes at a voltage no greater than 250 volts, which are products designed to transfer thermal energy from one temperature level to a higher temperature level for the purpose of heating water, including all ancillary equipment such as fans, storage tanks, pumps, or controls necessary for the device to perform its function~~an appliance for supplying hot water for purposes other than space heating or pool heating~~.

(g) Pool Heaters, Portable Electric Spas, Pumps, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.

"Bare pump" means a pump excluding mechanical equipment, driver, and controls.

"Basic model" of a federally regulated pump means all units of a given class of pump manufactured by one manufacturer, having the same primary energy source, and having essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; except that:

(1) for RSV and ST pumps, all variations in numbers of stages of the bare pump must be considered a single basic model;

(2) pump models for which the bare pump differs in impeller diameter, or impeller trim, may be considered a single basic model; and

(3) pump models for which the bare pump differs in number of stages or impeller diameter and which are sold with motors (or motors and controls) of varying horsepower may only be considered a single basic model if:

(i) for ESCC, ESFM, IL, and RSV pumps, each motor offered in the basic model has a nominal full load motor efficiency rated at the federal minimum (see the current table for NEMA Design B motors at Table S-1 of this Article) or the same number of bands above the federal minimum for each respective motor horsepower (see Table 3 of Appendix A to subpart Y of 10 C.F.R. part 431); or

(ii) for ST pumps, each motor offered in the basic model has a full load motor efficiency at the default nominal full load submersible motor efficiency shown in Table 2 of Appendix A to subpart Y of 10 C.F.R. part 431 or the same number of bands above the default nominal full load submersible motor efficiency for each respective motor horsepower (see Table 3 of Appendix A to subpart Y of 10 C.F.R. part 431).

"Best efficiency point (BEP)" means the pump hydraulic power operating point (consisting of both flow and head conditions) that results in the maximum efficiency.

"Bowl diameter" means the maximum dimension of an imaginary straight line passing through and in the plane of the circular shape of the intermediate bowl of the bare pump that is perpendicular to the pump shaft and that intersects the outermost circular shape of the intermediate bowl of the bare pump at both of its ends, where the intermediate bowl is as defined in ANSI/HI 2.1-2.2-2014.

"Capacitor start-capacitor run" means a capacitor start single phase motor that has a capacitor in series with the starting winding.

"Capacitor start-induction run" means a motor that uses a capacitor via the starting winding to start an induction motor, where the capacitor is switched out by a centrifugal switch once the motor is up to speed.

"Clean water pump" means a pump that is designed for use in pumping water with a maximum non-absorbent free solid content of 0.016 pounds per ft^3, and with a maximum dissolved solid content of 3.1 pounds per ft^3, provided that the total gas content of the water does not exceed the saturation volume, and disregarding any additives necessary to prevent the water from freezing at a minimum of 14°F.

"Close-coupled pump" means a pump in which the motor shaft also serves as the impeller shaft for the bare pump.

"Coefficient of performance (COP)" of a heat pump pool heater means the ratio of heat output to the total power input in consistent units, as determined using the applicable test method in ~~S~~section 1604(g) of this Article.

"Continuous control" means a control that adjusts the speed of the pump driver continuously over the driver operating speed range in response to incremental changes in the required pump flow, head, or power output.

"Control" means any device that can be used to operate the driver. Examples include, but are not limited to, continuous or non-continuous controls, schedule-based controls, on/off switches, and float switches.

"Default speed" means the low speed, having a rotation rate that is no more than one-half of the motor's maximum rotation rate.

"Driver" means the machine providing mechanical input to drive a bare pump directly or through the use of mechanical equipment. Examples include, but are not limited to, an electric motor, internal combustion engine, or gas/steam turbine.

"Dry rotor pump" means a pump in which the motor rotor is not immersed in the pumped fluid.

"Electric heat pump pool heater" means an appliance designed for heating nonpotable water and employing a compressor, water-cooled condenser, and outdoor air coil.

"Electric resistance pool heater" means an appliance designed for heating nonpotable water and employing electric resistance heating elements.

"Electronically commutated motor (ECM)" means a brushless DC motor that utilizes a permanent magnet rotor and built in inverters.

"End suction close-coupled (ESCC) pump" means a close-coupled, dry rotor, end suction pump that has a shaft input power greater than or equal to 1 hp and less than or equal to 200 hp at BEP and full impeller diameter and that is not a dedicated-purpose pool pump. Examples include, but are not limited to, pumps within the specified horsepower range that comply with ANSI/HI nomenclature OH7, as described in ANSI/HI 1.1-1.2-2014.

"End suction frame mounted/own bearings (ESFM) pump" means a mechanically coupled, dry rotor, end suction pump that has a shaft input power greater than or equal to 1 hp and less than or equal to 200 hp at BEP and full impeller diameter and that is not a dedicated-purpose pool pump. Examples include, but are not limited to, pumps within the specified horsepower range that comply with ANSI/HI nomenclature OH0 and OH1, as described in ANSI/HI 1.1-1.2-2014.

"End suction pump" means a single-stage, rotodynamic pump in which the liquid enters the bare pump in a direction parallel to the impeller shaft and on the side opposite the bare pump's driver-end. The liquid is discharged through a volute in a plane perpendicular to the shaft.

"Fire pump" means a pump that is compliant with NFPA 20-2016 "Standard for the Installation of Stationary Pumps for Fire Protection," and is either:

(1) UL listed under ANSI/UL 448-2013 "Standard for Safety Centrifugal Stationary Pumps for Fire-Protection Service," or
(2) FM Global (FM) approved under the January 2015 edition of FM Class Number 1319, "Approval Standard for Centrifugal Fire Pumps (Horizontal, End Suction Type)."

"Fossil fuel-fired pool heater" means an appliance designed for heating nonpotable water and employing natural gas or oil burners.

"Full impeller diameter" means the maximum diameter impeller with which a given pump basic model is distributed in commerce.

~~"Heat pump pool heater" means an air-to-water heat pump pool heater, employing a compressor, water-cooled condenser, and outdoor air coil in a single package assembly.~~

"Horizontal motor" means a motor that requires the motor shaft to be in a horizontal position to function as designed, as specified in the manufacturer literature.

"Hybrid pool heater" means an appliance designed for heating nonpotable water and employing both a heat pump (compressor, water-cooled condenser, and outdoor air coil) and a fossil fueled burner as heating sources.

"In-line (IL) pump" means a pump that is either a twin-head pump or a single-stage, single-axis flow, dry rotor, rotodynamic pump that has a shaft input power greater than or equal to 1 hp and less than or equal to 200 hp at BEP and full impeller diameter, in which liquid is discharged through a volute in a plane perpendicular to the shaft. Such pumps do not include pumps that are mechanically coupled or close-coupled, have a pump power output that is less than or equal to 5 hp at BEP at full impeller diameter, and are distributed in commerce with a horizontal motor. Examples of in-line pumps include, but are not limited to, pumps within the specified horsepower range that comply with ANSI/HI nomenclature OH3, OH4, or OH5, as described in ANSI/HI 1.1-1.2-2014.

~~"Low temperature rating" means the conditions described as "low temperature rating" in Table G-1 of Section 1604(g).~~

"Magnet driven pump" means a pump in which the bare pump is isolated from the motor via a containment shell and torque is transmitted from the motor to the bare pump via magnetic force. The motor shaft is not physically coupled to the impeller or impeller shaft.

"Mechanical equipment" of a federally regulated pump means any component of a pump that transfers energy from the driver to the bare pump.

"Mechanically coupled pump" means a pump in which the bare pump has its own impeller shaft and bearings and so does not rely on the motor shaft to serve as the impeller shaft.

"Multi speed motor" means a motor whose speed may be selected from several different pre-set ranges.

"Nameplate HP" means the HP displayed on the nameplate mounted on the motor.

"Non-continuous control" means a control that adjusts the speed of a driver to one of a discrete number of non-continuous preset operating speeds, and does not respond to incremental reductions in the required pump flow, head, or power output.

"PEI_{CL}" means the constant load pump energy index of a pump tested using the applicable test method in section 1604(g)(4) of this Article.

"PEI_{VL}" means the variable load pump energy index of a pump tested using the applicable test method in section 1604(g)(4) of this Article.

"Permanent magnet synchronous" means a motor that has a permanent magnet rotor, and windings on the stator and is controlled by single-phase or multi-phase sinusoidal alternating current.

"Permanent split capacitor (PSC)" means a two-phase motor operated from a single-phase voltage source with a capacitor connected in series with either one of the two windings.

"Pool heater" means an appliance designed for heating non-potable water contained at atmospheric pressure, including heating water in ~~for~~ swimming pools, spas, hot tubs, and similar applications.

"Pool pump motor capacity" means a-value equal to the product of motor's nameplate HP and service factor.

"Portable electric spa" means a factory-built electric spa or hot tub, supplied with equipment for heating and circulating water.

"Prime-assist pump" means a pump that:
(1) Is designed to lift liquid that originates below the centerline of the pump inlet;
(2) Requires no manual intervention to prime or re-prime from a dry-start condition; and

(3) Includes a device, such as a vacuum pump or air compressor and venturi eductor, to remove air from the suction line in order to automatically perform the prime or re-prime function at any point during the pump's operating cycle.

"Pump" means equipment designed to move liquids (which may include entrained gases, free solids, and totally dissolved solids) by physical or mechanical action and includes a bare pump and, if included by the manufacturer at the time of sale, mechanical equipment, driver, and controls.

"Radially split, multi-stage, vertical, in-line diffuser casing (RSV) pump" means a vertically suspended, multi-stage, single axis flow, dry rotor, rotodynamic pump:
(1) that has a shaft input power greater than or equal to 1 hp and less than or equal to 200 hp at BEP and full impeller diameter and at the number of stages required for testing and
(2) in which liquid is discharged in a place perpendicular to the impeller shaft; and
(3) for which each stage (or bowl) consists of an impeller and diffuser;
(4) for which no external part of such a pump is designed to be submerged in the pumped liquid; and
(5) examples include, but are not limited to, pumps complying with ANSI/HI nomenclature VS8, as described in ANSI/HI 2.1-2.2-2014.

"Readily accessible on-off switch" of a pool heater means an on-off switch located in a place that can be easily used without the need for tools to remove any covering when the pool heater is on display in a store or when it is installed.

"Replacement residential pool pump motor" means a replacement motor intended to be coupled to an existing residential pool pump that is used to circulate and filter pool water in order to maintain clarity and sanitation.

"Residential pool pump" means an impeller attached to a motor that is used to circulate and filter pool water in order to maintain clarity and sanitation.

"Residential pool pump and motor combination" means a residential pool pump motor coupled to a residential pool pump.

"Residential pool pump motor" means a motor that is used as a replacement-residential pool pump motor or as part of a residential pool pump and motor combination.

"Rotodynamic pump" means a pump in which energy is continuously imparted to the pumped fluid by means of a rotating impeller, propeller, or rotor.

"Self-priming pump" means a pump that:
(1) Is designed to lift liquid that originates below the centerline of the pump inlet;
(2) Contains at least one internal recirculation passage; and
(3) Requires a manual filling of the pump casing prior to initial start-up, but is able to re-prime after the initial start-up without the use of external vacuum sources, manual filling, or a foot valve.

"Service factor (of an AC motor)" means a multiplier which, when applied to the rated horsepower, indicates a permissible horsepower loading which can be carried under the conditions specified for the service factor.

"Single axis flow pump" means a pump in which the liquid inlet of the bare pump is on the same axis as the liquid discharge of the bare pump.

~~"Spa conditions rating" means the conditions described as "spa conditions rating" in Table C-1 of Section 1604(g).~~

"Spa volume" means the actual fill volume of the spa, under normal use, in gallons, as defined in the test method in ~~S~~section 1604(g)(2)(B) of this Article.

"Speed" means the number of revolutions of the motor shaft in a given unit of time. Speed is expressed in revolutions per minute (RPM).

"Split phase start" means a motor that employs a main winding with a starting winding to start the motor. After the motor has attained approximately 75 percent of rated speed, the starting winding is automatically disconnected by means of a centrifugal switch or by a relay.

~~"Standard temperature rating" means the conditions described as "standard temperature rating" in Table G-1 of Section 1604(g).~~

"Submersible turbine (ST) pump" means a single-stage or multi-stage, dry rotor, rotodynamic pump that is designed to be operated with the motor and stage(s) fully submerged in the pumped liquid; that has a shaft input power greater than or equal to 1 hp and less than or equal to 200 hp at BEP and full impeller diameter and at the number of stages required for testing; and in which each stage of this pump consists of an impeller and diffuser, and liquid enters and exits each stage of the bare pump in a direction parallel to the impeller shaft. Examples include, but are not limited to, pumps within the specified horsepower range that comply with ANSI/HI nomenclature VS0, as described in ANSI/HI 2.1-2.2-2014.

"Thermal efficiency" of a pool heater means a measure of the percentage of heat from the input that is transferred to the water, as determined using the applicable test method in ~~S~~section 1604(g) of this Article.

"Total horsepower" ~~(~~of an AC motor~~)~~" means a value equal to the product of the motor's service factor and the motor's nameplate (rated) horsepower.

"Twin head pump" means a dry rotor, single-axis flow, rotodynamic pump that contains two impeller assemblies, which both share a common casing, inlet, and discharge, and each of which:
(1) Contains an impeller, impeller shaft (or motor shaft in the case of close-coupled pumps), shaft seal or packing, driver (if present), and mechanical equipment (if present);
(2) Has a shaft input power that is greater than or equal to 1 hp and less than or equal to 200 hp at best efficiency point (BEP) and full impeller diameter;
(3) Has the same primary energy source (if sold with a driver) and the same electrical, physical, and functional characteristics that affect energy consumption or energy efficiency;
(4) Is mounted in its own volute; and
(5) Discharges liquid through its volute and the common discharge in a plane perpendicular to the impeller shaft.

"Two speed motor" means a motor designed or intended to be operated at one of two preset speeds.

"Variable speed motor" means a motor whose speed can vary continuously over a specified range.

(h) Plumbing Fittings.

"Basic model" of a federally regulated commercial pre-rinse spray valve means all spray settings of a given class manufactured by one manufacturer, which have essentially identical physical and functional (or hydraulic) characteristics that affect water consumption or water efficiency.

"Commercial pre-rinse spray valve" means a handheld device that has a release-to-close valve and is suitable for removing food residue from food service items before cleaning them in commercial dishwashing or ware washing equipment~~hand-held device designed and marketed for use with commercial dishwashing and ware washing equipment that sprays water on dishes, flatware, and other food service items for the purpose of removing food residue before cleaning the items~~.

"Faucet" means a lavatory faucet, kitchen faucet, metering faucet, or replacement aerator for a lavatory or kitchen faucet.

"Flow rate" means the rate of water flow of a plumbing fitting, as determined using the applicable test method in ~~S~~section 1604(h) of this Article.

"Kitchen faucet" means a faucet designed for discharge into a kitchen sink.

"Kitchen replacement aerator" means an aerator sold as a replacement, separate from the kitchen faucet to which it is intended to be attached.

"Lavatory" means a basin or bowl designed for washing the face and hands.

"Lavatory faucet" means a plumbing fitting designed for discharge into a lavatory.

"Lavatory replacement aerator" means an aerator sold as a replacement, separate from the lavatory faucet to which it is intended to be attached.

"Leakage rate" means the rate of leakage through a tub spout diverter directly into the bathtub when the diverter is in the diverting position, as determined using the applicable test method in ~~S~~section 1604(h) of this Article.

"Lift-type tub spout diverter" means a tub spout diverter that is operated by lifting the control.

"Metering faucet" means a faucet that, when turned on, will gradually shut itself off over a period of several seconds.

"ozf" means ounce force.

"Plumbing fitting" means a device that controls and guides the flow of water in a supply system. A plumbing fitting includes a showerhead, lavatory faucet, kitchen faucet, metering faucet, lavatory replacement aerator, kitchen replacement aerator, wash fountain, commercial pre-rinse spray valve, public lavatory faucet, or tub spout diverter.

"psi" means pounds per square inch.

"Public lavatory faucet" means a fitting intended to be installed in non-residential bathrooms that are exposed to walk-in traffic.

"Pull-type tub spout diverter" means a tub spout diverter that is operated by pulling the control.

"Push-type tub spout diverter" means a tub spout diverter that is operated by pushing the control.

"Showerhead" means a device through which water is discharged for a shower bath. Showerhead means any showerhead (including a hand held showerhead), except a safety showerhead.

~~"Showerhead" means a device through which water is discharged for a shower bath.~~

"Showerhead-tub spout diverter combination" means a group of plumbing fittings sold as a matched set and consisting of a control valve, a tub spout diverter, and a showerhead.

"Spray force" of a commercial prerinse spray valve means the amount of force exerted onto the spray disc, measured in ounce-force (ozf).

"Tub spout diverter" means a device designed to stop the flow of water into a bathtub and to divert it so that the water discharges through a showerhead.

"Turn-type tub spout diverter" means a tub spout diverter that is operated by turning the control.

"Wash fountain" means a lavatory faucet designed for simultaneous use by two or more persons.

"Water use" means the quantity of water flowing through a showerhead or faucet, at point of use, determined in accordance with test procedures under Appendix S of subpart B of 10 C.F.R. part 430.

(i) Plumbing Fixtures.

~~"Blowout type bowl" means a nonsiphonic type water closet bowl that is designed for a blowout action, and that has an integral flushing rim, a trapway at the rear of the bowl, a visible or concealed jet, a wall outlet, and, if wall mounted, a three bolt hole configuration.~~

"Blowout ~~water closet~~toilet" means a water closet ~~with a blowout type~~that uses a non-siphonic bowl with an integral flushing rim, a trap at the rear of the bowl, and a visible or concealed jet that operates with a blowout action.

"Dual-flush effective flush volume" means the average flush volume of two reduced flushes and one full flush.

"Dual-flush water closet" is a water closet incorporating a feature that allows the user to flush the water closet with either a reduced or a full volume of water.

"Electromechanical hydraulic water closet" means a water closet that utilizes electrically operated devices, such as, but not limited to, air compressors, pumps, solenoids, motors, or macerators in place of or to aid gravity in evacuating waste from the toilet bowl.

"Flushometer tank" means a flushometer valve that is integrated within an accumulator vessel affixed and adjacent to a plumbing fixture inlet so as to cause an effective enlargement of the supply line immediately before the fixture.

"Flushometer tank water closet" means a water closet utilizing a flushometer tank.

"Flushometer valve" means a valve that is attached to a pressurized water supply pipe and that is designed so that when actuated it opens the line for direct flow into the fixture at a rate and predetermined quantity to properly operate the fixture, and then gradually closes in order to provide trap reseal in the fixture and to avoid water hammer. The pipe to which the device is connected is, in itself, of sufficient size that when open shall allow the device to deliver water at a sufficient rate of flow for flushing purposes.

"Gallons per flush (gpf)" means gallons per flush as determined using the applicable test method in ~~S~~section 1604(i) of this Article.

"Gravity tank-type water closet" means a water closet that includes a storage tank from which water flows into the bowl by gravity.

"Plumbing fixture" means an exchangeable device, which connects to a plumbing system to deliver and drain away water and waste. A plumbing fixture includes a water closet or a urinal.

"Prison-type urinal" means a urinal designed and marketed expressly for use in prison-type institutions.

"Prison-type water closet" means a water closet designed and marketed expressly for use in prison-type institutions.

"Trough-type urinal" means a urinal designed for simultaneous use by two or more persons.

"Urinal" means a plumbing fixture that receives only liquid body waste and, on demand, conveys the waste through a trap seal into a gravity drainage system.

"Vacuum-type urinal" means a urinal whose bowl is evacuated by the application of a vacuum.

"Vacuum-type water closet" means a water closet whose bowl is evacuated by the application of a vacuum.

“Water closet” means a plumbing fixture having a water-containing receptor that receives liquid and solid body waste through an exposed integral trap into a gravity drainage system.

“Water use” means the quantity of water flowing through a water closet or urinal at point of use, determined in accordance with test procedures under Appendix T of subpart B of 10 C.F.R. part 430.

“Waterless urinal” means a urinal designed to be used without the application of water for flushing.

(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.

~~“Ballast efficacy factor” means the relative light output divided by the power input of a fluorescent lamp ballast, as measured under test conditions specified in ASNI C82.2-1984.~~

“Ballast luminous efficiency” means the total fluorescent lamp arc power divided by the fluorescent lamp ballast input power multiplied by the appropriate frequency adjustment factor, as defined in Appendix Q of subpart B of 10 C.F.R. part 430.

“Cathode heater cut-out circuit design” or “Cathode cut-out circuit design” means a fluorescent lamp ballast design that incorporates a cathode heater cut out device that turns off the cathode heaters in fluorescent lamps once the lamps are ignited and operating.

“Continuous dimming ballast” means a fluorescent lamp ballast that can continuously vary lamp light levels.

“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.

“Electronic circuit design” means the type of circuit used in an electronic fluorescent lamp ballast.

“Fluorescent lamp ballast” means a device that is used to start and operate fluorescent lamps by providing a starting voltage and current and limiting the current during normal operation.

“F34T12 lamp” (also known as a “F40T12/ES lamp”) means a nominal 34 watt tubular fluorescent lamp that is 48 inches in length and 1½ inches in diameter, and conforms to ANSI C78.81-2003 (Data Sheet 7881-ANSI-1006-1).

~~“F40T12 lamp” means a nominal 40 watt tubular fluorescent lamp that is 48 inches in length and 1½ inches in diameter, and conforms to ANSI C78.81- 2003 (Data Sheet 7881-ANSI-1010-1).~~

~~“F96T12 lamp” means a nominal 75 watt tubular fluorescent lamp that is 96 inches in length and 1½ inches in diameter, and conforms to ANSI C78.81- 2003 (Data Sheet 7881-ANSI-3007-1).~~

“F96T12/ES lamp” means a nominal 60 watt tubular fluorescent lamp that is 96 inches in length and 1½ inches in diameter, and conforms to ANSI C78.81- 2003 (Data Sheet 7881-ANSI-3006-1).

~~“F96T12HO lamp” means a nominal 110 watt tubular fluorescent lamp that is 96 inches in length, and 1½ inches in diameter, and conforms to ANSI C78.81- 2003 (Data Sheet 7881-ANSI-1019-1).~~

“F96T12HO/ES lamp” means a nominal 95 watt tubular fluorescent lamp that is 96 inches in length and 1½ inches in diameter, and conforms to ANSI C78.81- 2003 (Data Sheet 7881-ANSI-1017-1).

"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 Appendix Q of ~~S~~subpart B of part 430.

"Instant start ballast" or "slimline instant start ballast" means a fluorescent lamp ballast that allows for instantaneous light production without the use of a starter circuit.

"Magnetic circuit design" means a fluorescent lamp ballast design that uses a magnetic core and coil and that alters the voltage and current, but not the frequency, to the lamp.

"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.

"Maximum input watts" means the maximum input wattage to a ballast resulting from the operation of the maximum number of lamps when tested in accordance with input/output measurements in the UL 935 standard for fluorescent lamp ballasts.

~~"Mercury vapor lamp" means a high intensity discharge lamp in which the major portion of the light is produced by radiation from mercury operating at a partial pressure in excess of 100,000 PA (approximately 1 atm), including such lamps that are clear, phosphor-coated, and self-ballasted.~~

~~"Mercury vapor lamp ballast" means a device that is designed and marketed to start and operate mercury vapor lamps by providing the necessary voltage and current.~~

"Minimum input watts" means the minimum input watts to a ballast resulting from the minimum number of lamps when tested in accordance with input/output measurements in the UL 935 standard for fluorescent lamp ballasts.

"Power factor" of a fluorescent lamp ballast means the power input divided by the product of ballast input voltage and input current of a fluorescent lamp ballast, as measured under test conditions specified in ANSI C-82.2-1984.

"Power input" means the power consumption in watts of a ballast and its associated fluorescent lamp or lamps, as determined using the applicable test method in ~~S~~section 1604(j) of this Article.

"Rapid start ballast" means a fluorescent lamp ballast design that uses a starter circuit to heat the cathodes before and during operation.

"Relative light output" means the light output delivered through the use of a ballast divided by the light output delivered through the use of a reference ballast, expressed as a percent, as determined using the applicable test method in ~~S~~section 1604(j) of this Article.

"Replacement ballast" means a ballast that:
(1) ~~is manufactured on or before June 30, 2010;~~
~~(2)~~ is designed for use to replace an existing fluorescent lamp ballast in a previously installed luminaire;
(~~3~~2) is marked "FOR REPLACEMENT USE ONLY";
(~~4~~3) is shipped by the manufacturer in packages containing not more than 10 fluorescent lamp ballasts; and
(~~5~~4) has output leads that when fully extended are a total length that is less than the length of the lamp with which the~~y are~~ ballast is intended to be operated.

"Specialty application mercury vapor lamp ballast" means a mercury vapor lamp ballast:
(1) ~~T~~that is designed and marketed for operation of mercury vapor lamps used in quality inspection, industrial processing, or scientific use, including fluorescent microscopy and ultraviolet curing; and
(2) ~~I~~in the case of a specialty application mercury vapor lamp ballast, the label of which:
(A) ~~P~~provides that the specialty application mercury vapor lamp ballast is 'For specialty applications only, not for general illumination'; and
(B) ~~S~~specifies the specific applications for which the ballast is designed.

"Stepped dimming ballast" means a fluorescent lamp ballast that can operate lamps at two or more light output steps.

"T5 lamp" means a tubular fluorescent lamp ⅝ inches in diameter.

"T8 lamp" means a tubular fluorescent lamp 8/8 or 1 inch in diameter.

"T12 lamp" means a tubular fluorescent lamp 12/8 or 1½ inches in diameter.

"Weighted ballast luminous efficacy" means the weighted average ballast luminous efficacy as calculated in section 1604(j)(~~3~~2)(D) of this Article.

(k) Lamps.

"Appliance Lamp" means any lamp that:
(1) is specifically designed to operate in a household appliance~~,~~ and has a maximum wattage of 40 watts~~, and is sold at retail,~~ (including an oven lamp, refrigerator lamp, and vacuum cleaner lamp); and
(2) when sold at retail, is designated and marketed for the intended application, with:
(~~1~~A) the designation on the lamp packaging; and
(~~2~~B) marketing materials that identify the lamp as being for appliance use.

"Average lamp efficacy (LPW)" means the measured lamp efficacy of fluorescent lamps, ~~general service~~ incandescent lamps, ~~or incandescent reflector lamps,~~ or light-emitting diode (LED) lamps, expressed in lumens per watt, as determined using the applicable test method in ~~S~~section 1604(k) of this Article.

"Average rated life" means the length of time declared by the manufacturer at which 50 percent of any large number of units of a lamp reaches the end of their individual lives.

"Beam angle" means the angle within which the lamp produces 50% of the maximum luminous intensity.

"~~Bi-pin~~Bipin lamp" means a lamp having a base with two pins that is used for tungsten-halogen reflector lamps, low-voltage tungsten-halogen lamps, or fluorescent lamps.

"Black Light Lamp" means a lamp that emits radiant energy in the UV-A band (315-400 nm) and is designated and marketed as a "black light". The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as a black light lamp.

"BPAR incandescent reflector lamp" means a reflector lamp as shown in figure C78.21-278 on page 32 of ANSI C78.21-2003.

"BR incandescent reflector lamp" means a reflector lamp that has:
(1) a bulged section below the bulb's major diameter and above its approximate base line as shown in Figure 1 (RB) on page 7 of ANSI C79.1-1994; and
(2) a finished size and shape shown in ANSI C78.21-1989, including the referenced reflective characteristics in ~~P~~part 7 of ANSI C78.21-1989.

"BR30" means a BR incandescent reflector lamp with a diameter of 30/8ths of an inch and a lamp wattage of 85 or less.

"BR40" means a BR incandescent reflector lamp with a diameter of 40/8ths of an inch and a lamp wattage of 120 or less.

"Bug Lamp" means a lamp that contains a filter to suppress the blue and green portions of the visible spectrum and is designated and marketed as a "bug light". The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a bug lamp.

~~"Candelabra base incandescent lamp" means a lamp that uses candelabra screw base as described in ANSI C81.61-2006, Specifications for Electric Bases, common designations E11 and E12.~~

"Center beam candle power" means luminous intensity at the center of the beam of a reflector lamp, measured in candelas (cd).

"Clear type lamp" means a general service incandescent lamp with an envelope (commonly referred to as the bulb) that utilizes no diffusive coatings. The filament is plainly visible. The illumination it produces is crisp-edged, with well-defined shadows on the background when an object is positioned in its emissive path. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a clear type lamp.

"Colored fluorescent lamp" means a fluorescent lamp designated and marketed as a colored lamp, and not designed or marketed for general illumination applications with either of the following characteristics:
(1) a CRI less than 40, as determined according to the method given in CIE publication 13.3- 1995, or
(2) a correlated color temperature less than 2,500K or greater than 7,000K as determined according to the method set forth in IES LM-9-09.

"Colored incandescent lamp" means an incandescent lamp designated and marketed as a colored lamp that has:
(1) a CRI of less than 50, as determined according to the test method given in CIE publication 13.3-1995; or
(2) a correlated color temperature less than 2,500K, or greater than 4,600K, where correlated color temperature is computed according to the "Computation of Correlated Color Temperature and Distribution Temperature," Journal of the Optical Society of America, Vol. 58, pages 1528-1595 (1968).

"Connected LED lamp" means an LED lamp capable of changing its lumen output or spectral power distribution in response to an external control signal other than a change in RMS AC supply voltage or a 0-10 volt DC control signal. Connected LED lamp includes lamps that can be controlled wirelessly and through power line carrier digital communication.

"Design voltage" with respect to an incandescent lamp means:
(1) the voltage marked as the intended operating voltage;
(2) the mid-point of the voltage range if the lamp is marked with a voltage range; or
(3) 120 V if the lamp is not marked with a voltage or voltage range.

"Directional lamp" means a lamp that has at least 80 percent of light output within a solid angle of π steradian corresponding to a cone with an angle of 120°.

"Duv" means the closest distance from the chromaticity coordinate of the light source to the Planckian locus on the International Commission on Illumination (CIE) (u′, 2/3 v′) coordinates with ″+″ sign for above and ″-″ sign for below the Planckian locus.

~~"Enhanced Spectrum" or "Modified Spectrum" lamp, as related to incandescent lamps, means an incandescent lamp that is not a colored incandescent lamp, and, when operated at its rated voltage and wattage:~~
~~(1) Has a color point with (x,y) chromaticity coordinates on the Commission Internationale de l'Eclairage (C.I.E.) 1931 chromaticity diagram that lies below the black-body locus, and~~
~~(2) Has a color point with (x,y) chromaticity coordinates on the C.I.E. 1931 chromaticity diagram that lies at least 4 MacAdam steps distant from the color point of a clear lamp with the same filament and bulb shape, operated at the same rated voltage and wattage. The MacAdam steps are defined as referenced in Illuminating Engineering Society of North America LM-16-1993.~~
~~The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being "enhanced spectrum," "modified spectrum," or a similar designation.~~

"ER incandescent reflector lamp" means a reflector lamp with an elliptical section below the bulb's major diameter and above its approximate baseline as shown in Figure 1 (RE) on page 7 of ANSI C79.1-1994 and a

finished size and shape shown in ANSI C78.21-1989 including the referenced reflective characteristics in part 7 of ANSI C78.21-1989.

"ER30" means an ER incandescent reflector lamp with a diameter of 30/8ths of an inch.

"ER40" means an ER incandescent reflector lamp with a diameter of 40/8ths of an inch.

"Federally-_regulated general service fluorescent lamp" means any fluorescent lamp which can be used to satisfy the majority of fluorescent lighting applications but does not include any lamp designed and marketed for the following non-general applications:
(1) fluorescent lamps designed to promote plant growth;
(2) fluorescent lamps specifically designed for cold temperature applications;
(3) colored fluorescent lamps;
(4) impact-resistant fluorescent lamps;
(5) reflectorized or aperture fluorescent lamps;
(6) fluorescent lamps designed for use in reprographic equipment;
(7) lamps primarily designed to produce radiation in the ultra-violet region of the spectrum; or
(8) lamps with a CRI of 87 or greater.

"Federally-_regulated general service incandescent lamp" means a standard incandescent or halogen-type lamp that:
(1) is intended for general service applications;
(2) has a medium screw base
(3) has a lumen range of not less than 310 lumens and not more than 2,600 lumens; and
(4) is capable of being operated at a voltage range at least partially within 110 and 130 volts;
but does not include the following incandescent lamps:
(A) An appliance lamp.
(B) A black light lamp.
(C) A bug lamp.
(D) A colored lamp.
(E) An infrared lamp.
(F) A left-hand thread lamp.
(G) A marine lamp.
(H) A marine signal service lamp.
(I) A mine service lamp.
(J) A plant light lamp.
(K) A reflector lamp.
(L) A rough service lamp.
(M) A shatter-resistant lamp (including a shatter-proof lamp and a shatter-protected lamp).
(N) A sign service lamp.
(O) A silver bowl lamp.
(P) A showcase lamp.
(Q) A 3-way incandescent lamp.
(R) A traffic signal lamp.
(S) A vibration service lamp.
(T) A G shape lamp (as defined in ANSI C78.20-2003 and C79.1-2002) with a diameter of five inches or more.
(U) A T shape lamp (as defined in ANSI C78.20-2003 and C79.1-2002) and that uses not more than 40 watts or has a length of more than 10 inches.
(V) A B, BA, CA, F, G16 1/2, G-25, G30, S, or M-14 lamp (as defined in ANSI C79.1-2002 and ANSI C78.20-2003) of 40 watts or less.

"Federally-_regulated general service lamp" includes:
(1) general service incandescent lamps;
(2) compact fluorescent lamps;
(3) general service light-emitting diode (LED or OLED) lamps; and

(4) any other lamps that the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps; but does not include any:
   (A) lighting application or bulb shape excluded from the definition of "federally-regulated general service incandescent lamp;" or;
   (B) general service fluorescent lamp or incandescent reflector lamp.

"Federally- regulated incandescent reflector lamp" (commonly referred to as a reflector lamp) means any lamp in which light is produced by a filament heated to incandescence by an electric current, that:
(1) is not colored or designed for rough or vibration service applications;
(2) contains an inner reflective coating on the outer bulb to direct the light;
(3) has an R, PAR, ER, BR, BPAR, or similar bulb shape with an E26 medium screw base;
(4) has a rated voltage or voltage range that lies at least partially in the range of 115 and 130 volts;
(5) has a diameter that exceeds 2.25 inches; and
(6) has a rated wattage that is 40 watts or higher.

"Fluorescent lamp" means a low pressure mercury electric-discharge source in which a ~~florescing~~fluorescing coating transforms some of the ultraviolet energy generated by the mercury discharge into light.

"Frost type lamp" means an inside-frosted lamp producing modest diffusion of the light with little reduction of light output. Any lamp labeled as "standard" or "frosted" is a "frost type lamp."

"Incandescent lamp" means a glass enclosure in which light is produced by a filament of conducting material heated by an electric current.

"Infrared lamp" means a lamp that radiates predominately in the infrared region of the electromagnetic spectrum, and where visible radiation is not of principal interest. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being an infrared lamp.

"Initial performance values" means the photometric and electrical characteristics of the lamp at the end of 100 hours of operation.

"Integrated compact fluorescent lamp" means an integrally ballasted compact fluorescent lamp that contains all components necessary for the starting and stable operation of the lamp, contains an ANSI standard base, does not include any replaceable or interchangeable parts, and is capable of being connected directly to a branch circuit through a corresponding ANSI standard lamp-holder (socket).

"Intermediate base incandescent lamp" means a lamp that uses an intermediate screw base as described in ANSI C81.61-2006, Specifications for Electric Bases, common designation E17.

"Lamp" means an electrical appliance that includes a glass envelope and produces optical radiation for the purpose of visual illumination, designated to be installed into a luminaire by means of an integral lamp-holder. Types of lamps include incandescent, fluorescent, and high intensity discharge (high pressure sodium and metal halide).

"Lamp Efficacy ~~(LE)~~" means the measured lumen output of a lamp in lumens divided by the measured lamp electrical power input in watts expressed in units of lumens per watt (LPW).

"Lamp electrical power input" means the total electrical input to the lamp, including both arc and cathode power where appropriate, at the reference condition, in units of watts.

"Left-handed thread lamp" means a lamp on which the base screws into a lamp socket in a counter-clockwise direction, and screws out of a lamp socket in a clockwise direction.

"Lifetime of a compact fluorescent lamp" means the length of operating time between first use and failure of 50 percent of the sample units, determined in accordance with the test procedures described in section 3.3 of Appendix W to subpart B of 10 C.F.R. part 430.

"Lumen maintenance" means the ~~luminous flux or~~ lumen output measured at a given time in the life of the lamp and expressed as a percentage of the ~~rated luminous flux or rated~~measured initial lumen output~~, respectively~~.

"Lumen output" means the ~~brightness of~~ total luminous flux produced by the lamp at full output, measured in ~~L~~lumens.

"Marine Lamp" means a lamp specifically designed to operate in a marine application. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a marine lamp or similar designation.

"Marine Signal Lamp" means a lamp specifically designed to provide signals to marine vessels for seaway safety. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a marine signal lamp or similar designation.

"Medium base compact fluorescent lamp" means an integrally ballasted fluorescent lamp with a medium screw base, a rated input voltage range of 115 to 130 volts, and which is designed as a direct replacement for a general service incandescent lamp; however the term does not include:
(1) any lamp that is:
  (A) specifically designed to be used for special purpose applications; and
  (B) unlikely to be used in general purpose applications, such as the applications described in the definition of "Federally- regulated general service incandescent lamp" in this section; or
(2) any lamp not described in the definition of "Federally- regulated general service incandescent lamp" in this section that is excluded by the Secretary, by rule, because the lamp is:
  (A) designed for special applications; and
  (B) unlikely to be used in general purpose applications.

"Medium screw base" means an Edison screw base identified with the prefix E–26 in the American National Standard for Electric Lamp Bases, ANSI IEC C81.61- 2003.

~~"Mercury vapor lamp" means a high intensity discharge (HID) lamp, including clear, phosphor-coated, and self-ballasted screw base lamps, in which the major portion of the light is produced by radiation from mercury typically operating at a partial vapor pressure in excess of 100,000 Pa (approximately 1 atm).~~

~~"Mercury vapor lamp ballast" means a device that is designed and marketed to start and operate mercury vapor lamps intended for general illumination by providing the necessary voltage and current.~~

"Mine ~~S~~service ~~L~~lamp" means a lamp specifically designed for use in ~~M~~mine applications. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a mine service lamp or similar designation.

"Modified spectrum" means, with respect to an incandescent lamp, an incandescent lamp that:
(1) is not a colored incandescent lamp; and
(2) when operated at the rated voltage and wattage of the incandescent lamp—
  (A) has a color point with (x,y) chromaticity coordinates on the C.I.E. 1931 chromaticity diagram, figure 2, page 3 of IESNA LM-16 that lies below the black-body locus; and
  (B) has a color point with (x,y) chromaticity coordinates on the C.I.E. 1931 chromaticity diagram, figure 2, page 3 of IESNA LM-16 that lies at least 4 MacAdam steps, as referenced in IESNA LM-16, distant from the color point of a clear lamp with the same filament and bulb shape, operated at the same rated voltage and wattage.

"Nominal lamp wattage" means the lamp wattage stated by the manufacturer on the lamp and on any accompanying documents or packaging.

"Organic light-emitting diode (OLED)" means a thin-film light-emitting device that typically consists of a series of organic layers between two electrical contacts (electrodes).

"Plant Light Lamp" means a lamp that contains a filter to suppress yellow and green portions of the spectrum and is designated and marketed as a "plant light". The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a plant light.

"Power" means the total amount of electric power required, measured in Watts, to operate the lamp, as measured at the base of the lamp.

"R20 incandescent reflector lamp" means a reflector lamp that has a face diameter of approximately 2.5 inches, as shown in figure 1(R) on page 7 of ANSI C79.1-1994.

"R20 short lamp" means a lamp that is an R20 incandescent reflector lamp that has a rated wattage of 100 watts; has a maximum overall length of 3⅝ ~~and 5/8~~, or 3.625, inches; and is designed, labeled, and marketed specifically for pool and spa applications.

"Rated lumens" means a lamp's lumen value as stated by the manufacturer on the lamp, the lamp's packaging, or the lamp's marketing materials.

"Rated luminous flux" or "rated lumen output" means the initial lumen rating (100 hour) declared by the manufacturer, which consists of the lumen rating of a lamp at the end of 100 hours of operation.

"Rated supply frequency" means the frequency marked on the lamp.

"Rated voltage" means the voltage marked on the lamp. With respect to incandescent lamps, rated voltage means:
(1) the design voltage if the design voltage is 115V, 130V, or between 115V and 130V;
(2) 115V if the design voltage is less than 115V and greater than or equal to 100V and the lamp can operate at 115V; and
(3) 130V if the design voltage is greater than 130V and less than or equal to 150V and the lamp can operate at 130V.

~~"Rated wattage" means the wattage marked on the lamp. With respect to 4-foot medium bi-pin T8, T10, or T12 lamps, rated wattage means if the lamp is:~~
~~(1) listed in ANSI C78.1-1991, the nominal wattage of a lamp determined by the lamp designation in Annex A.2 of ANSI C78.1-1991; or~~
~~(2) a residential straight-shaped lamp, the wattage a lamp consumes when operated on a reference ballast for which the lamp is designed; or~~
~~(3) neither listed in ANSI C78.1-1991 nor a residential straight-shaped lamp, the wattage a lamp consumes when using reference ballast characteristics of 236 volts, 0.43 amps and 439 ohms for T10 or T12 lamps, or reference ballast characteristics of 300 volts, 0.265 amps, and 910 ohms for T8 lamps.~~

"Rated wattage" means:
(1) with respect to fluorescent lamps and general service fluorescent lamps, if the lamp is:
  (A) listed in ANSI C78.81 or ANSI C78.901-2014, the rated wattage of a lamp determined by the lamp designation of Clause 11.1 of ANSI C78.81 or ANSI C78.901-2014;
  (B) a residential straight-shaped lamp, and not listed in ANSI C78.81, the wattage of a lamp when operated on a reference ballast for which the lamp is designed; or
  (C) neither listed in one of the ANSI standards referenced in (1)(A) of this definition, nor a residential straight-shaped lamp, the electrical power of a lamp when measured according to the test procedures outlined in 10 C.F.R. Appendix R to subpart B of part 430.
(2) with respect to general service incandescent lamps and incandescent reflector lamps, the electrical power measured according to the test procedures outlined in 10 C.F.R. Appendix R to subpart B of part 430.

"Reflector lamp" means a lamp that has a reflective coating applied directly to part of the bulb surface and that reflects light in a forward direction away from the lamp base. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a reflector lamp or similar designation.

"Residential straight-shaped lamp" means a low pressure mercury electric-discharge source in which a fluorescing coating transforms some of the ultraviolet energy generated by the mercury discharge into light, including a straight-shaped fluorescent lamp with medium ~~bi-pin~~bipin bases of nominal overall length of 48 inches and is either designed exclusively for residential applications; or designed primarily and marketed exclusively for residential applications.

(1) A lamp is designed exclusively for residential applications if it will not function for more than 100 hours with a commercial high-power-factor ballast.
(2) A lamp is designed primarily and marketed exclusively for residential applications if it:
    (A) is permanently and clearly marked as being for residential use only;
    (B) has a life of 6,000 hours or less when used with a commercial high-power-factor ballast;
    (C) is not labeled or represented as a replacement for a fluorescent lamp that is a covered product; and
    (D) is marketed and distributed in a manner designed to minimize use of the lamp with commercial high-power-factor ballasts.
(3) A manufacturer may market and distribute a lamp in a manner designed to minimize use of the lamp with commercial high-power-factor ballasts by:
    (A) packaging and labeling the lamp in a manner that clearly indicates the lamp is for residential use only and includes appropriate instructions concerning proper and improper use; if the lamp is included in a catalog or price list that also includes commercial/industrial lamps, listing the lamp in a separate residential section accompanied by notes about proper use on the same page; and providing as part of any express warranty accompanying the lamp that improper use voids such warranty; or
    (B) using other comparably effective measures to minimize use with commercial high-power-factor ballasts.

"Rough service lamp" means a lamp that:

(1) has a minimum of 5 supports with filament configurations that are ~~C-7A, C-11, C-17, and C-22~~ C7A, C11, C17, and C22 as listed in Figure 6-12 of the 9th edition of the IES Lighting Handbook, or similar configurations where lead wires are not counted as supports; and
(2) is designated and marketed specifically for 'rough service' applications, with:
    (A) the designation appearing on the lamp packaging; and
    (B) marketing materials that identify the lamp as being for rough service.

~~"Self-ballasted compact fluorescent lamp" means a compact fluorescent lamp unit that incorporates, permanently enclosed, all elements that are necessary for the starting and stable operation of the lamp, and does not include any replaceable or interchangeable parts.~~

"Shatter-resistant lamp, shatter-proof lamp, or shatter-protected lamp" means a lamp that:

(1) has a coating or equivalent technology that is compliant with the NSF/ANSI 51-2007 and is designed to contain the glass if the glass envelope of the lamp is broken; and
(2) is designated and marketed for the intended application, with:
    (A) the designation on the lamp packaging; and
    (B) marketing material that identify the lamp as being shatter-resistant, shatter-proof, or shatter-protected.

"Showcase lamp" means a lamp that has a tubular bulb with a conventional screw base. The longer lamps have filaments with supports similar to linear incandescent lamps. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a showcase lamp.

"Sign service lamp" means a lamp of the vacuum type or gas-filled with sufficiently low bulb temperature to permit exposed outdoor use on high-speed flashing circuits. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a sign service lamp.

"Silver Bowl lamp" means a lamp that has a reflective coating applied directly to part of the bulb surface and that reflects light in a backward direction toward the lamp base. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a silver bowl lamp or similar designation.

"Slimline lamp" means a straight tubular-shaped instant start lamp with single pin bases of nominal overall length of 96 inches and a rated wattage of 52 or more, as defined in ANSI C78.81-2003.

"Soft white type lamp" means a lamp that emits diffuse illumination that produces soft-edged, poorly defined shadows on the background when an object is positioned in its em~~m~~issive path. The designation shall be on the lamp packaging, and marketing materials shall identify the lamp as being a soft white lamp.

"Specialty application mercury vapor lamp ballast" means a mercury vapor lamp ballast that:
(1) is designed and marketed for operation of mercury vapor lamps used in quality inspection, industrial processing, or scientific use, including fluorescent microscopy and ultraviolet curing; and
(2) in the case of a specialty application mercury vapor lamp ballast, the label of which:
    (A) provides that the specialty application mercury vapor lamp ballast is "For specialty applications only, not for general illumination"; and
    (B) specifies the specific applications for which the ballast is designed.

~~"State-regulated general service incandescent lamp" means a standard incandescent or halogen type lamp that: is intended for general service applications; has a medium screw base; has a wattage rating no less than 25 watts and no greater than 150 watts; has a rated voltage range at least partially within 110 and 130 volts; has a A-15, A-19, A-21, A-23, A-25, PS-25, PS-30, BT-14.5, BT-15, CP-19, TB-19, CA-22, or equivalent shape as defined in ANSI C78.20-2003; and has a bulb finish of the frosted, clear, or soft white type. The following incandescent lamps are not state-regulated general service incandescent lamps: appliance, black light, bug, colored, infrared, left-hand thread, marine, marine signal service, mine service, plant light, reflector, rough service, shatter resistant, sign service, silver bowl, showcase, three-way, traffic signal, and vibration service or vibration resistant.~~

~~"State-regulated incandescent reflector lamp" means a lamp that is not colored or designed for rough or vibration service applications, that contains an inner reflective coating on the outer bulb to direct the light, a E26 medium screw base, that has a rated voltage or voltage range that lies at least partially within 115 to 130 volts, and that is either:~~
~~(1) a BR or ER bulb shape with a diameter 2.25 inches or more;~~
~~(2) a R, PAR, BR or similar bulb shape and which has a diameter of 2.25 to 2.75 inches.~~

"State-regulated Light Emitting Diode (LED) lamp" means a lamp capable of producing light with Duv between -0.012 and 0.012, and that has an E12, E17, E26, or ~~GU-24~~ GU24 base, including LED lamps that are designed for retrofit within existing recessed can housings that contain one of the preceding bases. State-regulated LED lamp does not include a lamp with a brightness of more than 2,600 lumens or a lamp that cannot produce light with a correlated color temperature between 2200-K and 7000-K.

"State-regulated small diameter directional lamp" means a directional lamp that meets all of the following criteria:
(1)~~.~~ Capable of operating at 12 volts, 24 volts, or 120 volts;
(2)~~.~~ Has an ANSI ANSLG C81.61-2009 (R2014) compliant pin base or E26 base;
(3)~~.~~ Is a non-tubular directional lamp with a diameter of less than or equal to 2.25 inches;
(4)~~.~~ Has a lumen output of less than or equal to 850 lumens, or has a wattage of 75 watts or less; and
(5)~~.~~ Has a rated life greater than 300 hours.
State-regulated small diameter directional lamp includes incandescent filament, LED, and any other lighting technology that falls within this definition. State-regulated small diameter directional lamp does not include directional lamps with an E26 base that utilize light emitting diodes (LEDs) and are covered under the definition of state-regulated Light Emitting Diode Lamps.

"~~Three~~3-way incandescent lamp" ~~includes~~means an incandescent lamp that
(1) employs two filaments, operated separately and in combination, to provide three light levels~~.~~, and
(2) ~~The designation shall be~~ is designated on the lamp packaging~~,~~ and marketing materials ~~shall identify the lamp~~ as being a ~~three~~3-way incandescent lamp.

"U-shaped lamp" means a tubular U-shaped fluorescent lamp with a medium ~~bi-pin~~bipin base with a nominal overall length between 22 and 25 inches and a rated wattage of 28 or more.

"Vibration service lamp" means a lamp that:
(1) has filament configurations that are ~~C-5, C-7A, or C-9~~C5, C7A, or C9, as listed in Figure 6-12 of the 9th Edition of the IES Lighting Handbook or similar configurations;
(2) has a maximum wattage of 60 watts;
(3) is sold at retail in packages of two lamps or less; and
(4) is designated and marketed specifically for vibration service or vibration-resistant applications with:
    (A) the designation appearing on the lamp packaging; and
    (B) marketing materials that identify the lamp as being vibration service only.

"Voltage range" means a band of operating voltages as marked on an incandescent lamp, indicating that the lamp is designed to operate at any voltage within the band.

(l) Emergency Lighting and Self-Contained Lighting Controls.

"Astronomical time-switch control" means an automatic time-switch control device capable of controlling lighting based on the time of day and astronomical events such as sunset and sunrise, accounting for geographic location and date of the year.

"Automatic daylight control" means a self-contained lighting control device that automatically adjusts lighting levels by using one or more photosensors to detect changes in daylight illumination and then changing the electric lighting level in response to the changes in daylight.

"Automatic time-switch control" means a self-contained lighting control device that controls lighting based on the time of day.

"Average Luminance" means the arithmetic mean of all points measured on a surface.

"Dimmer" means a self-contained lighting control device that varies the electric light lumen output in order to change the level of illumination and energy use.

"DIP switch" means one of a set of small on-off switches mounted inside a self-contained lighting control that modifies the functionality of the lighting control.

"Edge-lit exit sign" means an illuminated exit sign in which lettering etched into a glass, plastic, or similar panel is illuminated through the edge of the panel and in which the lettering and the background are luminous.

"Electroluminescent light source" means a solid-state device which produces light when an electric current is passed through a phosphor-impregnated material.

"Face" means an illuminated side of an illuminated exit sign.

"Illuminated exit sign" means a sign that:
(1) is designed to be permanently fixed in place to identify an exit; and
(2) consists of:
    (A) an electrically powered integral light source that illuminates the legend "EXIT" and any directional indicators; and
    (B) provides contrast between the legend, any directional indicators, and the background.

"Input power" means the rate of electricity consumption, in watts, of an illuminated exit sign.

"Input power demand" means the amount of power required to continuously illuminate an exit sign model, measured in watts. For exit sign models with rechargeable batteries, input power demand shall be measured with batteries at full charge.

"Lighting control system" means a lighting control in which two or more components are required to be installed in the field to provide all of the functionality required to make a fully functional and compliant lighting control. Lighting control systems are regulated under ~~S~~sections 119 and 134 of the Title 24 of the California Code of Regulations.

"Luminance" means a measure of the brightness of a luminous surface.

"Luminance contrast" means the relative brightness of an object against its background.

"Matrix illuminated exit sign" means an illuminated exit sign that uses an array of small light sources, such as LEDs, to form the lettering of a sign.

"Maximum to minimum luminance ratio" means the ratio of maximum to minimum luminance where the luminance should be uniform.

"Occupant sensing device" means a self-contained lighting control that automatically controls light, allows for complete manual operation, and includes the following devices:

(1) "Motion sensor," which means an occupant sensing device that is used outdoors, automatically turns lights off when an area is vacated, and automatically turns the lights on when the area is occupied.
(2) "Occupancy sensor," which means an occupant sensing device that is used indoors and automatically turns lights off when an area is vacated and is capable of automatically turning lights on when an area is occupied.
(3) "Partial off," which means a motion sensor or occupancy sensor that automatically turns off part of the lighting load when an area is vacated and is capable of automatically turning on the lighting load when an area is occupied.
(4) "Partial on," which means a motion sensor or occupancy sensor that automatically turns lights off when an area is vacated and is capable of automatically and manually turning on part of the lighting load when an area is occupied.
(5) "Vacancy sensor," which means an occupant sensing device that automatically turns lights off when an area is vacated but requires lighting loads to be turned on manually.

"Panel-type exit sign" means an illuminated exit sign in which a translucent panel diffuses a light source and in which both the lettering and background are luminous.

"Photo control" means an automatic daylight control device that automatically turns lights on and off, or automatically adjusts lighting levels, in response to the amount of daylight that is available. A photo control may also be one component of a field assembled lighting system, the component having the capability to provide a signal proportional to the amount of daylight to a lighting control system for the purpose of dimming the electric lights.

"Photometric measurements" means the measurements of luminance levels made on the face of the sign.

"Self-contained lighting control" means a unitary lighting control module where no additional components are required for it to be a fully functional lighting control. Self-contained lighting control includes an astronomical time-switch control; an automatic daylight control; an automatic time-switch control; a dimmer; a lighting photo control; or an occupant sensing device.

"Stencil illuminated exit sign" means an illuminated exit sign in which an opaque panel conceals the light source and in which only translucent lettering is luminous.

"Wall box dimmer" means a dimmer manufactured and intended to be mounted inside an electrical box within a wall.

(m) Traffic Signal Modules ~~and Traffic Signal Lamps~~.

"Power consumption" means the power consumption, in watts, of a traffic signal module ~~or a traffic signal lamp~~.

"Traffic signal lamp" means a lamp that is designed and marketed for traffic signal applications and has a lifetime of 8,000 hours or greater ~~with lifetime, wattage, focal length, filament configuration, mounting, lamp glass, and lamp base characteristics appropriate for use in traffic signals~~.

"Traffic signal module for vehicle control" means a standard 8-inch (200 mm) or 12-inch (300 mm) round traffic signal indication that:

(1) consists of a light source, a lens, and all other parts necessary for operation; and
(2) communicates movement messages to drivers through red, amber, green colors.

"Traffic signal module for pedestrian control" means a traffic signal module that conveys movement information to pedestrians.

(n) Luminaires and Torchieres.

"Art work luminaire" means a luminaire designed only to be mounted directly to art work only for the purpose of illuminating that art work.

"Automatic daylight control" is a control that automatically reduces lighting in response to available daylight. This control typically uses photosensors to detect changes in daylight illumination and then change the electric lighting level in response to the daylight changes.

"Correlated Ccolor ~~correlated~~ temperature (CCT)" means the color appearance, or actual color of the lamp in accordance with IES LM-16-1993.

~~"Compact fluorescent lamp" means a fluorescent lamp typically designed to replace general service incandescent lamps, but may include sizes that replace conventional linear fluorescent lamps in smaller luminaires, and are typically less than 24 inches in length. "Fluorescent lamp" is defined in Section 1602(k) of this Article.~~

"Dedicated fluorescent lamp socket" means one of the ANSI designated type of fluorescent lamp sockets that will accept only a compact or linear fluorescent lamp, and that is used in luminaires where the ballast is permanently installed in the luminaire between the power cord and the lamp socket. "Dedicated fluorescent lamp socket" does not include sockets where the ballast is located between the socket and the lamp, or where the ballast is integrated into the lamp.

"E12 screw-based socket" means an ANSI designation for a screw-base socket commonly referred to as a candelabra screw-base.

"E17 screw-based socket" means an ANSI designation for a screw-base socket commonly referred to as an intermediate screw-base.

"E26 screw-based socket" means an ANSI designation for a screw-base socket commonly referred to as a medium screw-base.

"General lighting application" means lighting that provides an interior or exterior area with overall illumination.

"~~GU-24~~GU24" means the designation of a lamp holder and socket configuration, based on a coding system by the International Energy Consortium: "G" indicates the broad type of two or more projecting contacts, such as pins or posts; "U" distinguishes between lamp and holder designs of similar type that are not interchangeable due to electrical or mechanical requirements; and "24" indicates 24 millimeter center to center spacing of electrical contact posts."

"~~GU-24~~GU24 adaptor" means a one-piece device, pig-tail, wiring harness, or other such socket/base attachment that connects to a ~~GU-24~~GU24 socket on one end and provides a different type of socket or connection on the other end; a ~~GU-24~~GU24 adaptor does not alter the voltage. A fluorescent ballast with a ~~GU-24~~GU24 base is not a ~~GU-24~~GU24 adaptor.

"High frequency electronic ballast" means a fluorescent lamp ballast having an output frequency of no less than 20kHz. "Fluorescent lamp ballast" is defined in ~~S~~section 1602(j) of this Article.

"Indoor metal halide luminaire" is a metal halide luminaire that is not an outdoor metal halide luminaire.

"Integral control" means a fully functional occupancy sensor or automatic daylight control system for which all required components for an integral control, including control devices, sensors, and wiring, are factory

installed, packaged and sold with each individual luminaire, and are integrated into each individual luminaire at the factory in one of the following three methods:
(1) ~~I~~is integrated directly into the luminaire housing and hardwired to the lighting system; or
(2) ~~I~~is pre-wired to allow proper functionality between the control and luminaire, and to allow remote mounting of the control. One end of the wiring shall be pre-wired to the luminaire, and the other end shall be prewired to the control. The wiring may be either a metal or fiber conductor. The wiring may allow temporary disconnection in the field to allow remote mounting of the control; or
(3) ~~I~~is pre-wired with a wireless radio controlled sensor to allow proper functionality between the control and luminaire, and to allow interaction with the wireless control signal in the lighting system.

"Lamp-ballast system efficiency" means the efficiency of a lamp and ballast combination expressed as a percentage and calculated by dividing the output circuit lamp power by the input circuit power as measured in accordance with ANSI C82.6-2005 (American National Standard for Ballasts for High-Intensity Discharge Lamps - Methods of Measurement).

"LED array or module" means an assembly of LED packages (components), or dies on a printed circuit board or substrate, possibly with optical elements and additional thermal, mechanical, and electrical interfaces that are intended to connect to the load side of a LED driver. Power source and ANSI standard base are not incorporated into the device. The device cannot be connected directly to the branch circuit.

~~"LED lamp, non-integrated" means an assembly comprised of an LED array (module) or LED packages (components) and an ANSI standards base. The device is intended to connect to the LED driver of an LED luminaire through an ANSI standard lamp-holder (socket). The device cannot be connected directly to the branch circuit.~~

"LED lamp, integrated" means an integrated assembly comprised of LED packages (components) or LED arrays (modules), LED driver, ANSI standard base and other optical, thermal, mechanical and electrical components. The device is intended to connect directly to the branch circuit through a corresponding ANSI standard lamp holder (socket)

"LED lamp, non-integrated" means an assembly comprised of an LED array (module) or LED packages (components) and an ANSI standard base. The device is intended to connect to the LED driver of an LED luminaire through an ANSI standard lamp-holder (socket). The device cannot be connected directly to the branch circuit.

"LED luminaire" means a complete lighting unit consisting of LED-based light emitting elements and a matched driver together with parts to distribute light, to position and protect the light emitting elements, and to connect the unit to a branch circuit. The LED-based lighting emitting elements may take the form of LED packages (components), LED arrays (modules), or LED lamps. The LED luminaire is intended to connect directly to a branch circuit.

"LED package" means an assembly of one or more LED dies that includes wire bond or other type of electrical connections, possibly with an optical element and thermal, mechanical, and electrical interfaces. Power source and ANSI standardized base are not incorporated into the device. The device cannot be connected directly to the branch circuit.

~~"LED array or module" means an assembly of LED packages (components), or dies on a printed circuit board or substrate, possibly with optical elements and additional thermal, mechanical, and electrical interfaces that are intended to connect the load side of a LED driver. Power source and ANSI standard base are not incorporated into the device. The device cannot be connected directly to the branch circuit.~~

"Luminaire efficacy" for LEDs means the luminous efficacy of the LED luminaire, or of the LED light engine with integral heat sink, when tested in accordance with IES LM-79-08.

"Metal halide ballast" means a ballast used to start and operate metal halide lamps.

"Metal halide lamp" means a high-intensity discharge lamp in which the major portion of the light is produced by radiation of metal halides and their products of dissociation, possibly in combination with metallic vapors.

"Metal halide lamp fixture" or "Metal halide luminaire" means a light fixture for general lighting application designed to be operated with a metal halide lamp and a ballast for a metal halide lamp.

"Nonpulse-start electronic ballast" means an electronic ballast with a starting method other than pulse-start.

"Occupant sensor, lighting" ~~is~~means a device that automatically reduces lighting or turns lights off soon after an area is vacated.

"Outdoor metal halide luminaire" means a metal halide luminaire that is UL 1598 Wet Location Listed and labeled "Suitable for Wet Locations" as specified by the National Electrical Code 2005, Section 410.4(A).

"Portable floor luminaire" means a portable luminaire designed to be located on the floor and not located on a table, desk, or other structure above the floor.

"Portable luminaire" means a luminaire that has a flexible cord and an attachment plug for connection to a nominal 120-volt, 15- or 20-ampere branch circuit; that allows the user to relocate the luminaire without any rewiring; that are typically controlled with a switch located on the luminaire itself or on the power cord; and that are intended for use in accordance with the National Electrical Code, ANSI/NFPA 70-2002. Portable luminaire does not include any of the following:

~~(A)~~ (1) direct plug-in nightlights;
~~(B)~~ (2) sun and heat lamps;
~~(C)~~ (3) aquarium lamps;
~~(D)~~ (4) medical and dental lights;
~~(E)~~ (5) portable electric hand lamps;
~~(F)~~ (6) signs and commercial advertising displays;
~~(G)~~ (7) photographic lamps;
~~(H)~~ (8) germicidal lamps;
~~(I)~~ (9) illuminated vanity mirrors;
~~(J)~~ (10) lava lamps not providing general or task illumination;
~~(K)~~ (11) industrial work lights rated for use with lamps providing greater than 7,000 lumens;
~~(L)~~ (12) portable luminaires for marine use or for use in hazardous locations as defined in the National Electrical Code, ANSI/NFPA 70.;
~~(M)~~ (13) Christmas tree and decorative lighting outfits or electric candles and candelabras without lamp shades that are covered by the Standard for Christmas Tree and Decorative Outfits, UL 588.

"Portable table luminaire" means a portable luminaire designed to be located on a table, desk, or other structure above the floor.

"Probe-start metal halide ballast" means a ballast that:
(1) starts a probe-start metal halide lamp that contains a third starting electrode (probe) in the arc tube; and
(2) does not generally contain an igniter but instead starts lamps with high ballast open circuit voltage.

"Pulse-start metal halide ballast" means an electronic or electromagnetic ballast that starts a pulse-start metal halide lamp with high voltage pulses. Lamps shall be started by first providing a high voltage pulse for ionization of the gas to produce a glow discharge. To complete the starting process, power shall be provided by the ballast to sustain an arc through a glow-to-arc transition.

"System input power rating" means the operating input wattage of the rated lamp/ballast combination published in manufacturer's catalogs based on independent testing lab reports as specified by "Standards for Luminaire" UL 1598.

"Torchiere" means a portable electric lamp with a reflector bowl that directs light upward to give indirect illumination.

"Under-cabinet luminaire" means a luminaire designed for mounting in, on, under, or within modular office furniture.

"Wall mount adjustable luminaire" means a portable luminaire that is designed only to be mounted on a wall, having no base which will allow the luminaire to stand on a horizontal surface.

(o) Dishwashers.

"Compact dishwasher" means a dishwasher that has a capacity of less than eight place settings plus six serving pieces as defined in 10 C.F.R.~~,~~ part 430, Appendix C1 of ~~S~~subpart B.

"Cycle" means a sequence of operations of a dishwasher that performs a complete dishwashing operation, and that may include variations or combinations of the functions of washing, rinsing, and drying.

"Dishwasher" means a cabinet-like appliance that with the aid of water and detergent, washes, rinses, and dries (when a drying process is included) dishware, glassware, eating utensils, and most cooking utensils by chemical, mechanical, or electrical means, and discharges to ~~a~~the plumbing drainage system.

"Energy factor" of a dishwasher means cycles per kWh, as determined using the applicable test method in ~~S~~section 1604(o) of this Article.

"Non-soil-sensing dishwasher" means a dishwasher that does not have the ability to adjust automatically any energy consuming aspect of the normal cycle based on the soil load of the dishes.

"Soil-sensing dishwasher" means a dishwasher that has the ability to adjust any energy-consuming aspect of the normal cycle based on the soil load of the dishes.

"Standard dishwasher" means a dishwasher that has a capacity equal to or greater than eight place settings plus six serving pieces as defined in 10 C.F.R. part 430, Appendix C1 of ~~S~~subpart B.

"Truncated normal cycle" means the normal cycle interrupted to eliminate the power-dry feature after the termination of the last rinse option.

"Water heating dishwasher" means a dishwasher that, as recommended by the manufacturer, is designed for heating cold inlet water (nominal 50°F) or designed for heating water with a nominal inlet water temperature of 120°F. Any dishwasher designated as water-heating (50°F or 120°F inlet water) must provide internal water heating to above 120°F in at least one phase of the normal cycle.

"Water-softening dishwasher" means a dishwasher which incorporates a water softening system that periodically consumes additional water and energy during the cycle to regenerate.

(p) Clothes Washers.

"Automatic clothes washer" means a class of clothes washer that has a control system that is capable of scheduling a pre-selected combination of operations, such as regulation of water temperature, regulation of the water fill level, and performance of wash, rinse, drain, and spin functions without the need for user intervention subsequent to the initiation of machine operation. Some models may require user intervention to initiate these different segments of the cycle after the machine has begun operation, but they do not require the user to intervene to regulate the water temperature by adjusting the external water faucet valves.

"Clothes washer" means a consumer product designed to clean clothes, utilizing a water solution of soap and/or detergent and mechanical agitation or other movement; and must be one of the following classes: automatic clothes washers, semi-automatic clothes washers, and other clothes washers~~an appliance designed to clean clothes utilizing a water solution of soap or detergent and mechanical agitation or other movement~~.

“Commercial clothes washer” means a soft mount front-loading or soft mount top-loading clothes washer with clothes container compartment no greater than 3.5 ft^3 for horizontal-axis clothes washers, or no greater than 4.0 ft^3 for vertical-axis clothes washers, that is designed for use in (1) applications where the occupants of more than one household will be using it, such as multi-family housing common areas and coin laundries; or (2) other commercial applications.

“Compact clothes washer” means a clothes washer of less than 1.6 ft^3 in clothes container compartment capacity.

“Cycle” means a sequence of operations of a clothes washer that performs a complete washing operation.

“Energy factor” of a clothes washer means ft^3 per kWh per cycle, as determined using the applicable test method in ~~S~~section 1604(p) of this Article.

“Front-loading clothes washer” means a clothes washer with the clothes container compartment access located on the front of the machine.

“Integrated modified energy factor” of a clothes washer means the quotient of the ~~cubic foot~~ft^3 (or liter) capacity of the clothes container divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the sum of the:
(1) ~~the~~ machine electrical energy consumption;
(2) ~~the~~ hot water energy consumption;
(3) ~~the~~ energy required for removal of the remaining moisture in the wash load; and
(4) ~~the~~ combined low-power mode energy consumption.

“Integrated water factor” of a clothes washer means the quotient of the total weighted per-cycle water consumption for all wash cycles in gallons divided by the ~~cubic foot~~ft^3 (or liter) capacity of the clothes washer.

“Modified energy factor (MEF)” of a clothes washer means the quotient of the ft^3 capacity of the clothes container divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load, as determined using the applicable test method in ~~S~~section 1604(p) of this Article.

“Other clothes washer” means a class of clothes washer which is not an automatic or semi-automatic clothes washer.

“Semi-automatic clothes washer” means a clothes washer that is the same as an automatic clothes washer except that user intervention is required to regulate the water temperature by adjusting the external water faucet valves.

“Soft mount clothes washer” means a clothes washer that does not require mechanical fastening to a floor for proper operating performance under typical commercial clothes washer applications.

“Standard clothes washer” means a clothes washer of 1.6 ft^3 ~~3~~ or more in clothes container compartment capacity.

“Suds-saving” means a feature or option on a clothes washer which allows the user to store used wash water in an external laundry tub for use with subsequent wash loads.

“Top-loading clothes washer” means a clothes washer with the clothes container compartment access located on the top of the machine.

“Water factor” means the quotient of the total weighted per-cycle water consumption divided by the capacity of the clothes washer, determined using the applicable test method in ~~S~~section 1604(p) of this Article.

(q) Clothes Dryers.

"Automatic termination control" means a dryer control system with a sensor which monitors either the dryer load temperature or its moisture content and with a controller which automatically terminates the drying process. A mark or detent which indicates a preferred automatic termination control setting must be present if the dryer is to be classified as having an "automatic termination control". A mark is a visible single control setting on one or more dryer controls.

"Clothes dryer" means a cabinet-like appliance that is designed to dry fabrics in a tumble-type drum with forced air circulation and that has a drum and a blower driven by an electric motor.

"Compact clothes dryer" means a clothes dryer with a drum capacity less than 4.4 ft^3.

"Cycle" means a sequence of operation of a clothes dryer which performs a clothes drying operation, and may include variations or combinations of the functions of heating, tumbling, and drying.

"Drum capacity" means the volume of the drying drum in ~~cubic feet~~ft^3.

"Electric clothes dryer" means a cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. ~~clothes dryer whose~~ The heat source is electricity and the drum and blower(s) are driven by an electric motor(s).

"Energy factor" of a clothes dryer means pounds of clothes dried per kWh, as determined using the applicable test method in ~~S~~section 1604(q) of this Article.

"Gas clothes dryer" means a ~~clothes dryer whose~~ cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. The heat source is gas and the drum and blower(s) are driven by an electric motor(s).

"Standard clothes dryer" means a clothes dryer with a drum capacity of 4.4 ft^3 or greater.

"Ventless clothes dryer" means a clothes dryer that uses a closed-loop system with an internal condenser to remove the evaporated moisture from the heated air. The moist air is not discharged from the cabinet.

(r) Cooking Products and Food Service Equipment.

"Built-in microwave oven" means a microwave oven that is supported by surrounding cabinetry, walls, or other similar structures on at least three sides, and can be supported by surrounding cabinetry or the floor.

"Commercial convection oven" means an appliance that is not a consumer product and that is designed for cooking food by forcing hot air over it using a fan in a closed cavity.

"Commercial hot food holding cabinet" means a heated, fully enclosed compartment, with one or more solid or partial glass doors, that is designed to maintain the temperature of hot food that has been cooked in a separate appliance. "Commercial hot food holding cabinet" does not include heated glass merchandising cabinets, drawer warmers or cook-and-hold appliances.

"Commercial range top" means an appliance that is not a consumer product and that is designed for cooking food by direct or indirect heat transfer from one or more cooking units to one or more cooking containers.

"Combined cooking product" means a household cooking appliance that combines a cooking product with other appliance functionality, which may or may not include another cooking product. Combined cooking products include the following products: Conventional range, microwave/conventional cooking top, microwave/conventional oven, and microwave/conventional range.

"Convection microwave oven" means a microwave oven that incorporates convection features and any other means of cooking in a single compartment.

"Conventional cooking top" means a category of cooking products ~~class of kitchen ranges and ovens~~ which is a household cooking appliance consisting of a horizontal surface containing one or more surface units ~~which~~that utilize ~~include either~~ a gas flame, ~~or~~ electric resistance heating, or electric inductive heating. This includes any conventional cooking top component of a combined cooking product.

"Conventional oven" means a category of cooking products ~~class of kitchen ranges and ovens~~ which is a household cooking appliance consisting of one or more compartments intended for the cooking or heating of food by means of either a gas flame or electric resistance heating. It does not include portable or countertop ovens which use electric resistance heating for the cooking or heating of food and are designed for an electrical supply of approximately 120 volts. This includes any conventional oven(s) component of a combined cooking product.

~~"Conventional range" means a class of kitchen ranges and ovens which is a household cooking appliance consisting of a conventional cooking top and one or more conventional ovens.~~

"Convertible cooking appliance" means any kitchen range and oven which is a household cooking appliance designed by the manufacturer to be changed in service from use with natural gas to use with LP-gas, and vice versa, by incorporating in the appliance convertible orifices for the main gas burners and a convertible gas pressure regulator.

"Cook-and-hold" appliance means a multiple-mode appliance intended for cooking food that may be used to hold the temperature of the food that has been cooked in the same appliance.

"Cooking products" means consumer products that are used as the major household cooking appliances. They are designed to cook or heat different types of food by one or more of the following sources of heat: gas, electricity, or microwave energy. Each product may consist of a horizontal cooking top containing one or more surface units and/or one or more heating compartments. They must be one of the following classes: conventional ranges, conventional cooking tops, conventional ovens, microwave ovens, microwave/conventional ranges, and other cooking products.

"Drawer warmer" means an appliance that consists of one or more heated drawers and that is designed to hold hot food that has been cooked in a separate appliance at a specified temperature.

"Food service equipment" means a commercial hot food holding cabinet, a commercial convection oven, or a commercial range top.

"Forced convection" means a mode of conventional oven operation in which a fan is used to circulate the heated air within the oven compartment during cooking.

"Heated glass merchandising cabinet" means an appliance with a heated cabinet constructed of glass or clear plastic doors which, with 70% or more clear area, is designed to display and maintain the temperature of hot food that has been cooked in a separate appliance.

"Major cooking component" means either a conventional cooking top, a conventional oven or a microwave oven.

~~"Microwave/conventional cooking top" means a class of kitchen ranges and ovens that is a household cooking appliance consisting of a microwave oven and a conventional cooking top.~~

~~"Microwave/conventional oven" means a class of kitchen ranges and ovens that is a household cooking appliance consisting of a microwave oven and a conventional oven in separate compartments.~~

~~"Microwave/conventional range" means a class of kitchen ranges and ovens which is a household cooking appliance consisting of a microwave oven, and a conventional oven in separate compartments, and a conventional cooking top.~~

"Microwave oven" means a ~~class of kitchen ranges and ovens comprised~~ category of cooking products which is a household cooking appliance~~s~~ consisting of a compartment designed to cook or heat food by means of microwave energy, including microwave ovens with or without thermal elements designed for surface browning of food and convection microwave ovens. This includes any microwave oven(s) component of a combined cooking product.

"Other cooking products" means any ~~class~~ category of cooking products other than ~~the conventional range,~~ conventional cooking tops, conventional ovens, and microwave oven~~, and microwave/conventional range classes~~.

"Standby mode" ~~(~~of a non-commercial cooking appliance~~)~~ means any mode in which a ~~conventional~~ cooking product~~top, conventional oven, conventional range, or microwave oven~~ is connected to a mains power source and offers one or more of the following user-oriented or protective functions which may persist for an indefinite time:

(1) facilitation of the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer;
(2) provision of continuous functions, including information or status displays (including clocks) or sensor-based functions. A timer is a continuous clock function (which may or may not be associated with a display) that allows for regularly scheduled tasks and that operates on a continuous basis.

"Surface unit" means either a heating unit mounted in a cooking top, or a heating source and its associated heated area of the cooking top, on which vessels are placed for the cooking or heating of food.

(s) Electric Motors and Compressors.

"Accreditation" means recognition by an accreditation body that a laboratory is competent to test the efficiency of electric motors according to the scope and procedures given in 10 C.F.R. sections 431.1 and 431.15, Test Method B of IEEE Std 112-2004 and CSA C390-10.

"Accreditation body" means an organization or entity that conducts and administers an accreditation system and grants accreditation.

"Accreditation system" means a set of requirements to be fulfilled by a testing laboratory, as well as rules of procedure and management, that are used to accredit laboratories.

"Actual volume flow rate" of an air compressor means the volume flow rate of air, compressed and delivered at the standard discharge point, referred to conditions of total temperature, total pressure and composition prevailing at the standard inlet point, and as determined in accordance with the test procedures prescribed in section 1604(s)(3) of this Article.

"Air compressor" means a compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of a compression element (bare compressor), driver(s), mechanical equipment to drive the compressor element, and any ancillary equipment.

"Air-over electric motor" means an electric motor rated to operate in and be cooled by the airstream of a fan or blower that is not supplied with the motor and whose primary purpose is providing airflow to an application other than the motor driving it.

"Alternative efficiency determination method" or AEDM, means, with respect to an electric motor or a small electric motor, a method of calculating the total power loss and average full load efficiency.

"Ancillary equipment" means any equipment distributed in commerce with an air compressor but that is not a bare compressor, driver, or mechanical equipment. Ancillary equipment is considered to be part of a given air compressor, regardless of whether the ancillary equipment is physically attached to the bare compressor, driver, or mechanical equipment at the time when the air compressor is distributed in commerce.

"Auxiliary substance" means any substance deliberately introduced into a compression process to aid in compression of a gas by any of the following: Lubricating, sealing mechanical clearances, or absorbing heat.

"Average full load efficiency" means the arithmetic mean of the full load efficiencies of a population of electric motors of duplicate design or of a population of small electric motors of duplicate design, where the full load efficiency of each motor in the population is the ratio (expressed as a percentage) of the motor's useful power output to its total power input when the motor is operated at its full rated load, rated voltage, and rated frequency.

"Bare compressor" means the compression element and auxiliary devices (e.g., inlet and outlet valves, seals, lubrication system, and gas flow paths) required for performing the gas compression process, but does not include any of the following:
(1) the driver;
(2) speed-adjusting gear(s);
(3) gas processing apparatuses and piping; and
(4) compressor equipment packaging and mounting facilities and enclosures.

"Basic model" of a federally regulated compressor means all units of a class of compressors manufactured by one manufacturer, having the same primary energy source, the same compressor motor nominal horsepower, and essentially identical electrical, physical, and functional (or pneumatic) characteristics that affect energy consumption and energy efficiency.

"Basic model" of a federally regulated electric motor, as defined in 10 C.F.R. section 431.12, means all units of a given type of electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics which affect energy consumption or efficiency. For the purpose of this definition, "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which 10 C.F.R. section 431.25 prescribes nominal full load efficiency standards.

"Basic model" of a federally regulated small electric motor, as defined in 10 C.F.R. section 431.442, means all units of a given type of small electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics that affect energy consumption or efficiency. For the purpose of this definition, "rating" means a combination of the small electric motor's group (i.e., capacitor-start, capacitor-run; capacitor-start, induction-run; or polyphase), horsepower rating (or standard kilowatt equivalent), and number of poles with respect to which 10 C.F.R. section 431.446 prescribes average full load efficiency standards.

"Certification program" means a certification system that determines conformity by electric motors with the energy efficiency standards prescribed by and pursuant to the Act.

"Certification system" means a system, that has its own rules of procedure and management, for giving written assurance that a product, process, or service conforms to a specific standard or other specified requirements, and that is operated by an entity independent of both the party seeking the written assurance and the party providing the product, process or service.

"Compressor" means a machine or apparatus that converts different types of energy into the potential energy of gas pressure for displacement and compression of gaseous media to any higher pressure values above atmospheric pressure and has a pressure ratio at full-load operating pressure greater than 1.3.

"Compressor motor nominal horsepower" means the motor horsepower of the electric motor, as determined in accordance with the applicable procedures in 10 C.F.R. part 431 subparts B and X, with which the rated air compressor is distributed in commerce.

"Definite purpose electric motor" means any electric motor ~~which~~that cannot be used in most general purpose applications and is designed either:
(1) To standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions other than usual, such as those specified in NEMA MG1-2009, paragraph 14.3, "Unusual Service Conditions; or
(2) For use on a particular type of application.

"Driver" means the machine providing mechanical input to drive a bare compressor directly or through the use of mechanical equipment.

~~"Efficiency" of an electric motor means the ratio of an electric motor's useful power output to its total power input, expressed in percentage.~~

"Electric motor" means a machine which converts electrical power into rotational mechanical power.

"Enclosed motor" means an electric motor so constructed ~~so~~ as to prevent the free exchange of air between the inside and outside of the case but not sufficiently closed to be termed airtight.

"Fire pump electric motor" means an electric motor, including any IEC equivalent, that meets the requirements of section 9.5 of NFPA 20 (2010).

"Full-load actual volume flow rate" means the actual volume flow rate of the compressor at the full-load operating pressure.

"General purpose electric motor" means any electric motor that is designed in standard ratings with either:
(1) Standard operating characteristics and mechanical construction for use under usual service conditions, such as those specified in NEMA MG1-2009, paragraph 14.2, "Usual Service Conditions," and without restriction to a particular application or type of application; or
(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA MG1-2009, paragraph 14.3, "Unusual Service Conditions," or for a particular type of application, and which can be used in most general purpose applications.

"General purpose electric motor (subtype I)" means a general purpose electric motor that:
(1) is a single-speed, induction motor;
(2) is rated for continuous duty ~~(NEMA MG1—2009)~~ (MG1) operation or for duty type S1 (IEC);
(3) contains a squirrel-cage ~~(NEMA MG1—2009)~~ (MG1) or cage (IEC) rotor;
(4) has foot-mounting that may include foot-mounting with flanges or detachable feet;
(5) is built in accordance with NEMA T-frame dimensions or their IEC metric equivalents, including a frame size that is between two consecutive NEMA frame sizes or their IEC metric equivalents;
(6) has performance in accordance with NEMA Design A ~~(NEMA MG1—2009)~~ (MG1) or NEMA Design B ~~(NEMA MG1—2009)~~ (MG1) characteristics or equivalent designs such as IEC Design N (IEC);
(7) operates on polyphase alternating current 60-hertz sinusoidal power, and:
  (A) is rated at 230 or 460 volts (or both) including motors rated at multiple voltages that include 230 or 460 volts (or both), or
  (B) can be operated on 230 or 460 volts (or both); and
(8) includes, but is not limited to, explosion-proof construction.

Note to Definition of General purpose electric motor (subtype I): References to "MG1" above refer to NEMA Standards Publication MG1-2009. References to "IEC" above refer to IEC 60034-1, 60034-12, 60050-411, and 60072-1.

"General purpose electric motor (subtype II)" means any general purpose electric motors ~~which~~ incorporates design elements of a general purpose electric motor (subtype I) but, unlike a general purpose electric motor (subtype I), is configured in one or more of the following ways:

(1) is built in accordance with NEMA U-frame dimensions as described in NEMA MG1-1967 or in accordance with the IEC metric equivalents, including a frame size that is between two consecutive NEMA frame sizes or their IEC metric equivalents;

(2) ~~H~~has performance in accordance with NEMA Design C characteristics as described in ~~NEMA MG1-2009)~~ MG1 or an equivalent IEC design(s) such as IEC Design H;

(3) is a close-coupled pump motor;

(4) is a footless motor;

(5) is a vertical solid shaft normal thrust motor (as tested in a horizontal configuration) built and designed in a manner consistent with ~~NEMA MG1-2009)~~ MG1;

(6) is an eight-pole motor (900 RPM); or

(7) is a polyphase motor with a voltage rating of not more than 600 volts, is not rated at 230 or 460 volts (or both), and cannot be operated on 230 or 460 volts (or both).

Note to Definition of General purpose electric motor (subtype II): With the exception of the NEMA Motor Standards MG1-1967references to "MG1" above refer to the 2009 NEMA MG1-2009. References to "IEC" above refer to IEC 60034-1, 60034-12, 60050-411, and 60072-1.

"IEC Design H motor" means an electric motor that:

(1) is an induction motor designed for use with three-phase power;

(2) contains a cage rotor;

(3) is capable of direct-on-line starting

(4) has 4, 6, or 8 poles;

(5) is rated from 0.4 kW to 1600 kW at a frequency of 60 Hz; and

(6) conforms to sections 8.1, 8.2, and 8.3 of the IEC 60034-12 edition 2 requirements for starting torque, locked rotor apparent power, and starting.

"IEC Design N motor" means an electric motor that:

(1) is an induction motor designed for use with three-phase power;

(2) contains a cage rotor;

(3) is capable of direct-on-line starting;

(4) has 2, 4, 6, or 8 poles;

(5) is rated from 0.4 kW to 1600 kW at a frequency of 60 Hz; and

(6) conforms to sections 6.1, 6.2, and 6.3 of the IEC 60034-12 edition 2.1 requirements for torque characteristics, locked rotor apparent power, and starting.

~~"Input power" means the full-load power input required to operate the motor.~~

~~"Multi-voltage electric motor" means an electric motor that is capable of operating at:~~

~~(1) 230 volts and another voltage other than 460 volts,~~

~~(2) 460 volts and at another voltage other than 230 volts, or~~

~~(3) both 230 volts and 460 volts and another voltage.~~

"Mechanical equipment" of a compressor means any component of an air compressor that transfers energy from the driver to the bare compressor.

"NEMA Design A motor" means a squirrel-cage motor that:

(1) is designed to withstand full-voltage starting and developing locked-rotor torque as shown in NEMA MG 1-2009, paragraph 12.38.1;

(2) has pull-up torque not less than the values shown in NEMA MG 1-2009, paragraph 12.40.1;

(3) has breakdown torque not less than the values shown in NEMA MG 1-2009, paragraph 12.39.1;

(4) has a locked-rotor current higher than the values shown in NEMA MG 1-2009, paragraph 12.35.1 for 60 hertz and NEMA MG 1-2009, paragraph 12.35.2 for 50 hertz; and

(5) has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

"NEMA Design B motor" means a squirrel-cage motor that:
(1) is designed to withstand full-voltage starting;
(2) develops locked-rotor, breakdown, and pull-up torques adequate for general application as specified in sections 12.38, 12.39 and 12.40 of NEMA MG1–2009;
(3) draws locked-rotor current not to exceed the values shown in section 12.35.1 for 60 hertz and 12.35.2 for 50 hertz of NEMA MG1-2009; and
(4) has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

"NEMA Design C motor" means a squirrel-cage motor that:
(1) is Designed to withstand full-voltage starting and developing locked-rotor torque for high-torque applications up to the values shown in NEMA MG1-2009, paragraph 12.38.2);
(2) has pull-up torque not less than the values shown in NEMA MG1-2009, paragraph 12.40.2;
(3) has breakdown torque not less than the values shown in NEMA MG1-2009, paragraph 12.39.2;
(4) has a locked-rotor current not to exceed the values shown in NEMA MG1-2009, paragraphs 12.35.1 for 60 hertz and 12.35.2 for 50 hertz; and
(5) has a slip at rated load of less than 5 percent.

"Nominal full load efficiency" means, with respect to an electric motor, a representative value of efficiency selected from the "nominal efficiency" column of Table 12–10, NEMA MG1-2009, that is not greater than the average full load efficiency of a population of motors of the same design.

"Open motor" means a motor having ventilating openings which permit passage of external cooling air over and around the windings of the machine.

"Package isentropic efficiency" means the ratio of power required for an ideal isentropic compression process to the actual packaged compressor power input used at a given load point, as determined in accordance with the test procedures prescribed in section 1604(s)(3) of this Article.

"Pressure ratio at full-load operating pressure" means the ratio of discharge pressure to inlet pressure, determined at full-load operating pressure in accordance with the test procedures prescribed in 10 C.F. R. section 431.344.

"Rotor" means a compression element that rotates continually in a single direction about a single shaft or axis.

"Small electric motor" means a NEMA general purpose alternating current single-speed induction motor, built in a two-digit frame number series in accordance with NEMA Standards Publication MG1-1987, including IEC metric equivalent motors.

"Special purpose motor" means any motor, other than a general purpose motor or definite purpose motor, which has special operating characteristics or special mechanical construction, or both, designed for a particular application.

"Total power loss" means that portion of the energy used by an electric motor not converted to rotational mechanical power, expressed in percent.

"Variable-speed compressor" means an air compressor that is capable of adjusting the speed of the driver continuously over the driver operating speed range in response to incremental changes in the required compressor actual volume flow rate.

(t) Distribution Transformers.

"Autotransformer" means a transformer that:
(1) has one physical winding that consists of a series winding part and a common winding part;
(2) has no isolation between its primary and secondary circuits; and
(3) during step-down operation, has a primary voltage that is equal to the total of the series and common winding voltages, and a secondary voltage that is equal to the common winding voltage.

"Basic model" of a federally regulated distribution transformer, as defined in 10 C.F.R. section 431.192, means a group of models of distribution transformers manufactured by a single manufacturer, that have the same insulation type (i.e., liquid-immersed or dry-type), have the same number of phases (i.e., single or three), have the same standard kVA rating, and do not have any differentiating electrical, physical, or functional features that affect energy consumption. Differences in voltage and differences in basic impulse insulation level (BIL) rating are examples of differentiating electrical features that affect energy consumption.

"BIL" means basic impulse ~~isolation~~insulation level.

"Distribution transformer" means a transformer that:
(1) has an input voltage of 34.5 kV or less;
(2) has an output voltage of 600 V or less;
(3) is rated for operation at a frequency of 60 Hz; and
(4) has a capacity of 10 kVA to 2500 kVA for liquid-immersed units and 15 kVA to 2500 kVA for dry-type units; but
(5) the term "distribution transformer" does not include a transformer that is an:
  (A) autotransformer;
  (B) drive (isolation) transformer;
  (C) grounding transformer;
  (D) machine-tool (control) transformer;
  (E) nonventilated transformer;
  (F) rectifier transformer;
  (G) regulating transformer;
  (H) sealed transformer;
  (I) special-impedance transformer;
  (J) testing transformer;
  (K) transformer with tap range of 20 percent or more;
  (L) uninterruptible power supply transformer; or
  (M) welding transformer.

"Drive (isolation) transformer" means a transformer that:
(1) isolates an electric motor from the line;
(2) accommodates the added loads of drive-created harmonics; and
(3) is designed to withstand the additional mechanical stresses resulting from an alternating current adjustable frequency motor drive or a direct current motor drive.

"Efficiency of distribution transformer" means the ratio of useful power output to the total power input~~, expressed as a percent, as determined using the applicable test method in Section 1604(t)~~.

"Grounding transformer" means a three-phase transformer intended primarily to provide a neutral point for system-grounding purposes, either by means of:
(1) a grounded wye primary winding and a delta secondary winding; or
(2) a transformer with its primary winding in a zig-zag winding arrangement, and with no secondary winding.

~~"Harmonic transformer" means a transformer that is designed to supply loads with higher than normal harmonic current levels and that has a K-rating of K-4 or greater.~~

~~"Impedance transformer" means a transformer that has a specified impedance less than 4 percent or greater than 8 percent.~~

"kVa" means kilovolt-ampere, which is the designation for the apparent power of a circuit.

"Liquid-immersed distribution transformer" means a distribution transformer in which the core and coil assembly is immersed in an insulating liquid.

"Low voltage dry-type distribution transformer" means a distribution transformer that has an input voltage of 600 volts or less, that is air cooled, and that does not use oil as a coolant.

"Machine-tool (control) transformer" means a transformer that is equipped with a fuse or other over-current protection device, and is generally used for the operation of a solenoid, contactor, relay, portable tool, or localized lighting.

"Medium-voltage dry-type distribution transformer" means a distribution transformer in which the core and coil assembly is immersed in a gaseous or dry-compound insulating medium, and which has a rated primary voltage between 601 V and 34.5 kV.

"Mining distribution transformer" means a medium-voltage dry-type distribution transformer that is built only for installation in an underground mine or surface mine, inside equipment for use in an underground mine or surface mine, on-board equipment for use in an underground mine or surface mine, or for equipment used for digging, drilling, or tunneling underground or above ground, and that has a nameplate which identifies the transformer as being for this use only.

"No-load loss" means those losses that are incident to the excitation of the transformer.

"Nonventilated transformer" means a transformer constructed so as to prevent external air circulation through the coils of the transformer while operating at zero gauge pressure.

"Phase angle" means the angle between two phasors, where the two phasors represent progressions of periodic waves of either:
(1) two voltages;
(2) two currents; or
(3) a voltage and a current of an alternating current circuit.

"Phase angle correction" means the adjustment (correction) of measurement data to negate the effects of phase angle error.

"Phase angle error" means incorrect displacement of the phase angle, introduced by the components of the test equipment.

"Rectifier transformer" means a transformer that operates at the fundamental frequency of an alternating-current system and that is designed to have one or more output windings connected to a rectifier.

"Reference temperature" means 20 °C for no-load loss, 55 °C for load loss of liquid-immersed distribution transformers at 50 percent load, and 75 °C for load loss of both low-voltage and medium-voltage dry-type distribution transformers, at 35 percent load and 50 percent load, respectively. It is the temperature at which the transformer losses must be determined, and to which such losses must be corrected if testing is done at a different point. (These temperatures are specified in the test method in 10 C.F.R. Appendix A to subpart K of part 431.)

"Regulating transformer" means a transformer ~~with automatic tap changers~~ that varies the voltage, the phase angle, or both voltage and phase angle, of an output circuit and compensates for fluctuation of load and input voltage, phase angle or both voltage and phase angle.

“Sealed transformer” means a transformer designed to remain hermetically sealed under specified conditions of temperature and pressure.

“Special-impedance transformer” means any transformer built to operate at an impedance outside of the normal impedance range for that transformer's kVA rating. The normal impedance range for each kVA rating for liquid-immersed and dry-type transformers is shown in Tables T-1 and T-2, respectively.

Table T-1
Normal Impedance Ranges for Liquid-Immersed Transformers

Single-phase		*Three-phase*	
kVA	***Impedance (%)***	***kVA***	***Impedance (%)***
10	1.0–4.5	15	1.0–4.5
15	1.0–4.5	30	1.0–4.5
25	1.0–4.5	45	1.0–4.5
37.5	1.0–4.5	75	1.0–5.0
50	1.5–4.5	112.5	1.2–6.0
75	1.5–4.5	150	1.2–6.0
100	1.5–4.5	225	1.2–6.0
167	1.5–4.5	300	1.2–6.0
250	1.5–6.0	500	1.5–7.0
333	1.5–6.0	750	5.0–7.5
500	1.5–7.0	1000	5.0–7.5
667	5.0–7.5	1500	5.0–7.5
833	5.0–7.5	2000	5.0–7.5
		2500	5.0–7.5

Table T-2
Normal Impedance Ranges for Dry-Type Transformers

Single-phase		*Three-phase*	
kVA	***Impedance (%)***	***kVA***	***Impedance (%)***
15	1.5–6.0	15	1.5–6.0
25	1.5–6.0	30	1.5–6.0
37.5	1.5–6.0	45	1.5–6.0
50	1.5–6.0	75	1.5–6.0
75	2.0–7.0	112.5	1.5–6.0
100	2.0–7.0	150	1.5–6.0
167	2.5–8.0	225	3.0–7.0
250	3.5–8.0	300	3.0–7.0
333	3.5–8.0	500	4.5–8.0
500	3.5–8.0	750	5.0–8.0
667	5.0–8.0	1000	5.0–8.0
833	5.0–8.0	1500	5.0–8.0
		2000	5.0–8.0
		2500	5.0–8.0

“Testing transformer” means a transformer used in a circuit to produce a specific voltage or current for the purpose of testing electrical equipment.

“Total loss” means the sum of the no-load loss and the load loss for a transformer.

“Transformer” means a device consisting of two or more coils of insulated wire and that transfers alternating current by electromagnetic induction from one coil to another to change the original voltage or current value.

"Transformer with tap range of 20 percent or more" means a transformer with multiple voltage taps, the highest of which equals at least 20 percent more than the lowest, computed based on the sum of the deviations of the voltages of these taps from the transformer's nominal voltage.

"Uninterruptible power supply (UPS) transformer" means a transformer that is used within an uninterruptible power system, which in turn supplies power to loads that are sensitive to power failure, power sags, over voltage, switching transients, line noise, and other power quality factors.

"Welding transformer" means a transformer designed for use in arc welding equipment or resistance welding equipment.

(u) External Power Supplies.

"Active mode" for federally regulated external power supplies and state-regulated external power supplies means the mode of operation when an external power supply is connected to the main electricity supply and the output is connected to a load.

"Adaptive external power supply" means an external power supply that can alter its output voltage during active-mode based on an established digital communication protocol with the end-use application without any user-generated action.

"Basic-voltage external power supply" means an external power supply that is not a low-voltage external power supply.

"Class A external power supply" ~~that is a federally regulated external power supply~~ means ~~an external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product and~~ a device that:
(1) is designed to convert line voltage AC input into lower voltage AC or DC output;
(2) is able to convert to only one AC or DC output voltage at a time;
(3) is sold with, or intended to be used with, a separate end-use product that constitutes the primary load;
(4) is contained in a separate physical enclosure from the end-use product;
(5) is connected to the end-use product via a removable or hard-wired male/female electrical connection, cable, cord, or other wiring; and
(6) has nameplate output power that is less than or equal to 250 watts.
The term "Class A external power supply" does not include any device that:
(A) requires Federal Food and Drug Administration listing and approval as a medical device in accordance with section 513 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360(c)); or
(B) powers the charger of a detachable battery pack or charges the battery of a product that is fully or primarily motor operated.

~~"Computer" means an electronic machine which, by means of stored instructions and information, performs rapid, often complex calculations or compiles, correlates, and selects data.~~

"Detachable battery" means a battery that is:
(1) Contained in a separate enclosure from the product; and
(2) Intended to be removed or disconnected from the product for recharging.

~~"Digital camera" means an electronic device used to store images in an electronic format rather than storing the images on film.~~

"Direct operation external power supply" means an external power supply that can operate a consumer product that is not a battery charger without the assistance of a battery.

"External power supply design family" means a set of external power supply basic models, produced by the same manufacturer, which share the same circuit layout, output power, and output cord resistance, but differ in output voltage.

"Federally regulated external power supply" means an external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product.

"Indirect operation external power supply" means an external power supply that cannot operate a consumer product that is not a battery charger without the assistance of a battery as determined by the steps in paragraphs (1)(A) through (E) of this definition:

(1) If the external power supply (EPS) can be connected to an end-use consumer product and that consumer product can be operated using battery power, the method for determining whether that EPS is incapable of operating that consumer product directly is as follows:
   (A) If the end-use product has a removable battery, remove it for the remainder of the test and proceed to the step in paragraph (1)(E) of this definition. If not, proceed to the step in paragraph (1)(B).
   (B) Charge the battery in the application via the EPS such that the application can operate as intended before taking any additional steps.
   (C) Disconnect the EPS from the application. From an off mode state, turn on the application and record the time necessary for it to become operational to the nearest five second increment (5 seconds, 10 seconds, etc.).
   (D) Operate the application using power only from the battery until the application stops functioning due to the battery discharging.
   (E) Connect the EPS first to mains and then to the application. Immediately attempt to operate the application. If the battery was removed for testing and the end-use product operates as intended, the EPS is not an indirect operation EPS and paragraph 2 of this definition does not apply. If the battery could not be removed for testing, record the time for the application to become operational to the nearest five second increment (5 seconds, 10 seconds, etc.).
(2) If the time recorded in paragraph (1)(E) of this definition is greater than the summation of the time recorded in paragraph (1)(C) of this definition and five seconds, the EPS cannot operate the application directly and is an indirect operation EPS.

"Low-voltage external power supply" means an external power supply with a nameplate output voltage less than 6 volts and nameplate output current greater than or equal to 550 milliamps.

~~"Mobile phone" means a telephone that is not a wireline telephone.~~

"Multiple-voltage external power supply" means an external power supply that is designed to convert line voltage AC input into more than one simultaneous lower-voltage output.

"No-load mode" means the mode of operation when a Class A external power supply is connected to the main electricity supply and the output is not connected to a load.

~~"Personal digital assistant" (PDA) means a lightweight, hand-held computer used as a personal organizer.~~

"Security or life safety alarm or surveillance system" means:

(1) Equipment designed and marketed to perform any of the following functions (on a continuous basis):
   (A) Monitor, detect, record, or provide notification of intrusion or access to real property or physical assets or notification of threats to life safety.
   (B) Deter or control access to real property or physical assets, or prevent the unauthorized removal of physical assets.
   (C) Monitor, detect, record, or provide notification of fire, gas, smoke, flooding, or other physical threats to real property, physical assets, or life safety.
(2) This term does not include any product with a principal function other than life safety, security, or surveillance that:
   (A) Is designed and marketed with a built-in alarm or theft-deterrent feature; or
   (B) Does not operate necessarily and continuously in active mode.

"Single-voltage external AC-AC power supply" means an external power supply that is designed to convert line voltage AC input into lower voltage AC output and is able to convert to only one AC output voltage at a time.

"Single-voltage external AC-DC power supply" means an external power supply that is designed to convert line voltage AC input into lower-voltage DC output and is able to convert to only one DC output voltage at a time.

"State-regulated external power supply" means a single-voltage external AC to DC or AC to AC power supply that:
(1) is designed to convert line voltage AC input into lower voltage DC or AC output;
(2) is able to convert to only one DC or AC output voltage at a time;
(3) is sold with, or intended to be used with, a separate end-use product that constitutes the primary load;
(4) is contained within a separate physical enclosure from the end-use product;
(5) is connected to the end-use product via a removable or hard-wired male/female electrical connection, cable, cord, or other wiring;
(6) does not have batteries or battery packs that physically attach directly (including those that are removable) to the power supply unit;
(7) does not have a battery chemistry or type selector switch and an indicator light; or, does not have a battery chemistry or type selector switch and a state of charge meter;
(8) has a nameplate output power less than or equal to 250 watts.

The term "state-regulated external power supply" does not include a device that is a "Class A external power supply" that is federally regulated.

"Switch-selectable single voltage external power supply" means a single-voltage AC-AC or AC-DC power supply that allows users to choose from more than one output voltage.

~~"Wireline telephone" means a telephone that makes a connection to the telephone network by having a wire from the telephone's base plugged into a telephone jack on the wall, floor, or other location.~~

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

"Add-in card" means a removable device that can be installed in a computer peripheral component interconnect (PCI) or other slot. Add-in card does not include hard-disks, system memory, removable devices that are intended to operate outside of a computer chassis, or other components that are listed in Table V-8. It also does not include cards, such as riser cards, that split or physically extend a motherboard slot.

"Aspect ratio" means the ratio of width to height of the viewable screen area. Common examples include 4:3 and 16:9.

"Audio standby-passive mode" means the appliance is connected to a power source, produces neither sound nor performs any mechanical function (e.g. playing, recording) but can be switched into another mode with the remote control unit or an internal signal.

"Automatic brightness control" means an integrated control system that automatically adjusts the brightness of a television based upon ambient lighting conditions.

"Combination TV" means a system in which a television or television monitor and an additional device or devices (including but not limited to a DVD player or VCR) are combined into a single unit in which the additional devices are included in the television casing.~~,~~

"Compact audio product", also known as a mini, mid, micro, or shelf audio system, means an integrated audio system encased in a single housing that includes an amplifier and radio tuner, attached or separable speakers, and can reproduce audio from one or more of the following media: magnetic tape, CD, DVD, or flash memory. "Compact audio product" does not include products that can be independently powered by internal batteries or that have a powered external satellite antenna, or that can provide a video output signal.

"Component TV" means a television composed of two or more separate components (e.g., separate display device and tuner) marketed and sold as a television under one model or system designation. The system may have more than one power cord.

"Composite video" means a video display interface that uses Radio Corporation of America (RCA) connections carrying a signal defined by the Society of Motion Picture and Television Engineers' (SMPTE) standard, SMPTE 170M-2004 for regions that support a power frequency of 59.94 Hz or International Telecommunication Union's (ITU) standard, ITU-R BT 470-6 for regions that support a power frequency of 50 Hz.

"Computer" means a device that performs logical operations and processes data. A computer includes both stationary and portable units and includes a desktop computer, a portable all-in-one, a notebook computer, a mobile gaming system, a high expandability computer, a small-scale server, a thin client, and a workstation. Although a computer is capable of using input devices and displays, such devices are not required to be included with the computer when the computer is shipped. A computer is composed of, at a minimum:
(1) A central processing unit (CPU) to perform operations or, if no CPU is present, then the device must function as a client gateway to a server and the server acts as a computational CPU;
(2) Ability to support user input devices such as a keyboard, mouse, or touchpad; and
(3) An integrated display screen or the ability to support an external display screen to output information.
The term "computer" does not include a tablet, a game console, a television, a small computer device, a server other than a small-scale server, or an industrial computer.

"Computer monitor" means an analog or digital device of diagonal screen size greater than or equal to 17 inches and less than or equal to 61 inches, that has a pixel density of greater than 5000 pixels per square inch, and that is designed primarily for the display of computer generated signals for viewing by one person in a desk-based environment. A computer monitor is composed of a display screen and associated electronics. A computer monitor does not include:

(1) Displays with integrated or replaceable batteries designed to support primary operation without AC mains or external DC power, (e.g., electronic readers, mobile phones, tablets, battery-powered digital picture frames); or
(2) A television or a signage display.

"Computer monitor off mode" means the computer monitor is connected to a power source, produces no visual information, and cannot be switched into any other mode with a remote control unit, an internal signal, or an external signal.

"Computer monitor sleep mode" means a low-power mode in which the computer monitor provides one or more non-primary protective functions or continuous functions.

"Computer off mode" means an ACPI System Level S5 state.

"Computer sleep mode" means a low-power mode that the computer enters automatically after a period of inactivity or by manual selection. A computer with sleep capability can quickly "wake" in response to network connections or user interface devices with a latency of less than or equal to five seconds from initiation of the wake event to the system becoming fully usable, including rendering of display. For systems where ACPI standards are applicable, computer sleep mode is ACPI System Level S3 (suspend to RAM) state. Some computers utilize an alternative sleep mode to ACPI S3.

~~"Component TV" means a television composed of two or more separate components (e.g., separate display device and tuner) marketed and sold as a television under one model or system designation. The system may have more than one power cord.~~

"Desktop computer" means a computer whose main unit is designed to be located in a fixed location, often on a desk or on the floor. A desktop computer includes an integrated desktop computer. A workstation, a high expandability computer, or a small-scale server is not a desktop computer.

"Digital Cinema Initiative (DCI)-P3" means a red-green-blue (RGB) color space that covers 41.7% of the CIELUV color space.

"Digital versatile disc (DVD)" means a laser-encoded plastic medium capable of storing a large amount of digital audio, video, and computer data.

"Digital versatile disc (DVD) player" means a commercially-available electronic product encased in a single housing that includes an integral power supply and for which the sole purpose is the decoding of digitized video signals on a DVD.

"Digital versatile disc (DVD) recorder" means a commercially-available electronic product encased in a single housing that includes an integral power supply and for which the sole purpose is the production or recording of digitized video signals on a DVD. "DVD recorder" does not include models that have an EPG function.

"Digital video recorder (DVR)" means a device which can record video signals onto a hard disk drive or other device that can store the images digitally. "DVR" does not include models that have an EPG function."

"Discrete GPU" means a graphics processing unit (GPU) with a local memory controller interface and local graphics-specific memory.

"Download acquisition mode (DAM)" or "Standby-active mode" means the product is connected to a power source, produces neither sound nor a picture, and is downloading channel listing information according to a defined schedule for use by the electronic programming guide, monitoring for emergency messaging/communications or otherwise communicating through a network protocol. The power use in this mode is typically greater than the power requirement in TV standby-passive mode and less than the power requirement in on mode.

"Electronic programming guide (EPG)" means an application that provides an interactive, onscreen menu of TV listings, and that downloads program information from the vertical blanking interval of a regular TV signal.

"Energy-Efficient Ethernet capability" means Ethernet interfaces that are capable of reducing power consumption during times of low data throughput, as specified in *IEEE 802.3az-2010*.

"Enhanced-performance display (EPD)" means a computer monitor that has all of the following features and functionalities:
(1) A contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85°, with or without a screen cover glass;
(2) A native resolution equal to or greater than 2.3 megapixels (MP); and
(3) A color gamut size of at least sRGB as defined by *IEC 61966-2 - 1:1999*. Shifts in color space are allowable as long as 99 percent or more of defined sRGB colors are supported.

"Expandability score (ES)" means the results of a calculation designed to estimate a computer's power supply capacity based on the power draw if each interface present in the system were operated at their designed maximum voltage and current.

"First discrete GPU" means the computer's discrete GPU that has the highest frame buffer bandwidth measured in gigabytes per second (GB/s).

"Forced menu" means a menu which requires the selection of a display mode by a user upon their first use after the manufacture of the television.

"Frame buffer bandwidth" means the amount of data that is processed per second by a discrete GPU, expressed in gigabytes per second (GB/s). It is calculated based on Ecma International Standard ECMA-383 (December 2010).

"Game console" means a device that is designed and marketed primarily for video game usage and that the consumer does not have the ability to add or remove system memory or a central processing unit.

"Gaming monitor" means a computer monitor that is capable of adjusting the monitor refresh rate with the frame rate of the video content, and supports a continuously variable refresh rate ranging across a factor of at least 1.75 times the minimum supported (for example, a variable refresh rate of at least 40Hz to 70Hz if the minimum supported refresh rate is 40Hz). The monitor may include incremental hardware-based assistance.

"Graphical user interface (GUI)" means a user interface, beyond a text-based interface, that allows users to interact with electronic devices through graphical icons and visual indicators.

"Graphics processing unit (GPU)" means an integrated circuit designed to accelerate the rendering of two-dimensional or three-dimensional content to displays. A GPU may be either integrated with the CPU or discrete.

<u>"High-definition multimedia interface (HDMI®)" means an audio and video interface as defined by HDMI® Specification Informational Version 1.0 or greater.</u>

"High expandability computer" means a computer with any of the following:
(1) An expandability score of more than 690;
(2) If the computer is manufactured before January 1, 2020, a power supply of 600 watts or greater and either:
  (A) a first discrete GPU with a frame buffer bandwidth of 400 gigabytes per second (GB/s) or greater; or
  (B) a total of 8 gigabytes or more of system memory with a bandwidth of 432 GB/s or more and an integrated GPU.
(3) If the computer is manufactured on or after January 1, 2020, a power supply of 600 watts or greater and either:
  (A) a first discrete GPU with a frame buffer bandwidth of 600 gigabytes per second (GB/s) or greater; or

(B) a total of 8 gigabytes or more of system memory with a bandwidth of 632 GB/s or more and an integrated GPU.

“Hybrid graphics” means a functionality that automatically places the system's first discrete GPU in a low-power state when not required in favor of an integrated GPU. This functionality allows graphics rendering by lower power and lower capability integrated GPUs while on battery or when the output graphics are not overly complex while then allowing the more power consumptive but more capable discrete GPU to provide rendering capability when the system requires it.

“Idle condition” means an active state of a computer where no user interaction is occurring and where no user-prescribed task is underway.

“Industrial computer” means any of the following:
(1) A process controller that is designed specifically to automate an industrial, medical, or laboratory process.
(2) A computer that is integrated into the chassis of industrial, medical, or laboratory equipment that contains more than a computer, and that is designed specifically to perform logical operations and process data for an industrial, medical, or laboratory product using product-specific software.

“Integrated desktop computer” means a desktop computer in which the computing hardware and display are integrated into a single housing, and which is connected to AC power through a single cable. Integrated desktop computers come in one of two forms:
(1) a system where the display and computer are physically combined into a single unit; or
(2) a system packaged as a single system where the display is separate but is connected to the main chassis by a DC power cord, and both the computer and display are powered from a single power supply.

“Integrated GPU” means a graphics solution that does not contain a discrete GPU.

“Integrated occupancy sensor” means a feature built into a television capable of sensing presence and entering TV standby-passive mode or standby-active mode to save energy in an empty room.

“Keyboard, video, and mouse (KVM)” or “keyboard, mouse, and monitor (KMM)” means a computer monitor that can operate with a KVM switch and is designed to be used in a server rack for use solely in a data center.

“Limited capability operating system” means an operating system that performs basic operations and that meets all of the following criteria:
(1) Does not have automatic power management features;
(2) Does not support USB devices;
(3) Does not have GUI; and
(4) Does not support multiple user profiles or distinguish between users.

“Long-idle mode” means a state where the computer has reached an idle condition 15 minutes after operating system boot, after completing an active workload, or after resuming from computer sleep mode, and the primary computer display has entered a low-power state where screen contents cannot be observed (for example, backlight has been turned off) but remains in the working mode ACPI G0.

“Main storage” means the largest capacity non-volatile storage device present in the system.

“Medical computer monitor” means a computer monitor that meets the definition of a device contained in Section 210(h) of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. § 321(h)) and is listed and approved as such by the U.S. Food and Drug Administration.

“Mobile gaming system” means a computer that is primarily used for gaming and that is designed specifically for portability and to be operated for extended periods both with and without a direct connection to an AC mains power source. A mobile gaming system is sold with an integrated display and a physical keyboard, and has all of the following criteria:
(1) First discrete GPU with frame buffer bandwidth of 128 gigabytes per second or greater;
(2) System memory of 16 gigabytes or more;

(3) An external power supply with a nameplate output power of 150 watts or greater; and
(4) Total battery capacity of 75 watt-hours or greater.

"Mobile thin client" means a notebook computer that relies on a connection to remote computing resources, such as a computer server or a remote workstation, to obtain primary functionality, and does not have integral rotational storage media.

"Mobile workstation" means a high-performance, single-user computer primarily used for graphics, computer-aided design (CAD), software development, financial, or scientific applications, among other computation intensive tasks, excluding game play, and that is designed specifically for portability and to be operated for extended periods of time either with or without a direct connection to an external power source. Mobile workstations utilize an integrated display and are capable of operation on an integrated battery. A mobile workstation may use an external power supply and have an integrated keyboard and pointing device. In addition, a mobile workstation must meet all of the following criteria:
(1) Has a mean time between failures (MTBF) of at least 13,000 hours;
(2) Has qualified or is currently being reviewed for qualification by two or more independent software vendor (ISV) product certifications;
(3) Supports either:
  (A) At least one discrete GPU with frame buffer bandwidth of 96 gigabytes per second or greater; or
  (B) A total of 4 gigabytes or more of system memory with a bandwidth of 134 gigabytes per second or greater and an integrated GPU;
(4) Supports the inclusion of three or more internal storage devices; and
(5) Supports at least 32 gigabytes of system memory.

"Monitor screen area" means the viewable screen area of the computer monitor, calculated by multiplying the viewable image width by the viewable image height. For curved screens, the measurements shall be made along the curvature on the face of the screen rather than along a straight line or chord.

"Native resolution" means the physically present number and size of pixels in a display panel.

"Native vertical resolution" means the physical pixel count for the vertical axis of the television. For example a television with a screen resolution of 1920 x 1080 would have a native vertical resolution of 1080.

"Notebook computer" means a computer designed specifically for portability and to be operated for extended periods both with and without a direct connection to an AC mains power source. A notebook computer is sold with an integrated display and a physical keyboard. The term "notebook computer" includes two-in-one notebooks, mobile thin clients, and notebook computer models with touch-sensitive screens. Notebook computer does not include mobile workstations or mobile gaming systems.

"On mode" means the product is connected to a power source and produces sound and a picture. The power requirement in this mode is typically greater than the power requirement in standby-passive and download acquisition modes.

"Organic light-emitting diode (OLED) monitor" means a monitor in which the emissive electroluminescent layer of the light-emitting diode is a film of organic compound that emits light in response to an electric current.

"Point of Deployment (POD)" means a card which enables a TV to have secure conditional access to a cable or satellite system.

"Portable all-in-one" means a computer designed for limited portability that meets all of the following criteria:
(1) Includes an integrated display with a diagonal size greater than or equal to 17.4 inches;
(2) Does not have a keyboard integrated into the physical housing of the product in its as-shipped configuration;
(3) Includes and primarily relies on touch-screen input, with optional keyboard;
(4) Includes the capacity to connect to a wireless network; and
(5) Includes an internal battery that can power the computer's primary functions.

"Professional signage display" means an electronic display that is:
(1) Composed of an area greater than 1,400 square inches;
(2) Composed of two or more display panels, each with a diagonal size greater than 12 inches;
(3) Designed to be operated by an external data controller; and
(4) Designed and marketed for viewing by multiple people in a non-desk-based environment. Examples of such environments include stadiums, airports, and convention centers.

"Rack-mounted workstation" means a workstation that is designed to be natively rack mounted as described in *IEC 60297-3-101:2004*. The rack-mounted workstation may be accessed locally by direct connection to the workstation and display or accessed remotely across a network by one or more users.

"Retail on mode power" is the measurement of on mode power in the most consumptive mode available in a forced menu.

"Screen size" means the diagonal length from one corner to the corner furthest away of the viewable screen area of a television, measured in inches.

"Selected input mode" means the input port(s) selected which the television is using as a source to produce a visible or audible output. These modes are required for televisions with multiple possible inputs including but not limited to coaxial, composite, S-Video, HDMI, and component connectors.

"Short-idle mode" means a state where the computer has reached an idle condition five minutes after operating system boot, after completing an active workload, or after resuming from computer sleep mode, and the primary computer display is on and the computer remains in the working mode ACPI G0 (S0).

"Signage display" means an analog or digital device designed primarily for the display of computer-generated signals that is not marketed for use as a computer monitor or a television.

"Small computer device" means a computer system with an integrated and primary display that has a screen area of 20 square inches or less.

"Small-scale server" means a computer that uses desktop components in a desktop form factor but that is designed to be a storage host for other computers. A small-scale server is designed to perform functions such as providing network infrastructure services (for example, archiving) and hosting data and media. This product is not designed to process information for other systems or run Web servers as a primary function. A small-scale server has all the following characteristics:
(1) Designed in a pedestal, tower, or other form factor similar to those of desktop computers such that all data processing, storage, and network interfacing is contained within one box or product;
(2) Designed to operate continuously, except for maintenance;
(3) Capable of operating in a simultaneous multi-user environment serving several users through networked client units; and
(4) Designed for an industry-accepted operating system for home or low-end server applications (e.g., Windows Home Server, Mac OS X Server, Linux, UNIX, Solaris).

"Small volume manufacturer" means a manufacturer that meets all of the following criteria:
(1) The manufacturer's gross revenues from the 12-month period preceding the certification under section 1606(~~k~~j) of this Article from all of the entity's operations, including operations of any other person or business entity that controls, is controlled by, or is under common control of the entity, is $2,000,000 or less;
(2) The manufacturer assembles and sells the computers at the same location; and
(3) The manufacturer has certified as a small volume manufacturer to the Energy Commission under Section 1606(~~k~~j) of this Article.

"System memory bandwidth" means the rate at which data can be read from or stored into the computer system's memory, expressed in gigabytes per second (GB/s).

"Tablet" means a device that is designed for portability and that meets all of the following criteria:
(1) Has an integrated display with a diagonal size less than 17.4 inches;
(2) Does not have an integrated, physically attached keyboard in its as-shipped configuration;
(3) Has and primarily relies on touch-screen input;
(4) Has and primarily relies on a wireless network connection; and
(5) Has and is primarily powered by an internal battery with connection to an AC mains power source for battery charging and not for primary powering of the device.
A tablet may be referred to as a slate.

"Television (TV)" means an analog or digital device designed primarily for the display and reception of a terrestrial, satellite, cable, Internet Protocol TV (IPTV), or other broadcast or recorded transmission of analog or digital video and audio signals. TVs include combination TVs, television monitors, component TVs, and any unit that is marketed to the consumer as a TV. "Television (TV)" does not include computer monitors.

"Television monitor" means a TV that does not have an internal tuner/receiver or playback device.

"Thin client" means an independently powered computer that relies on a connection to remote computing resources (for example, a computer server or a remote workstation) to obtain primary functionality. Main computing functions (for example, program execution, data storage, interaction with other internet resources) are provided by remote computing resources. A thin client does not have integral rotational storage media and is designed for use in a fixed location during operation.

"TV standby-passive mode" means the television is connected to a power source, produces neither sound nor picture but can be switched into another mode with the remote control unit or via an internal signal.

"Two-in-one notebook" means a notebook computer which has a clam shell form factor, but has a detachable keyboard. The keyboard and display portions of the product must be shipped as an integrated unit.

"Very high performance monitor" means a computer monitor that meets all of the following criteria:
(1) Has a diagonal screen size of 27 inches or greater;
(2) Has a native resolution equal to or greater than either 3840x2160 pixels or 8.29 megapixels;
(3) Has a color space greater than 99 percent of defined Adobe RGB color or greater than 99 percent of Digital Cinema Initiative (DCI)-P3 colors; and
(4) Has a contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85°, with or without a screen cover glass.

~~"Very high performance monitor" means a computer monitor that meets all of the following criteria:~~
~~(1) Has a diagonal screen size of 27 inches or greater;~~
~~(2) Has a native resolution equal to or greater than either 3840x2160 pixels or 8.29 megapixels;~~
~~(3) Has a color space greater than 99 percent of defined Adobe RGB color or greater than 99 percent of Digital Cinema Initiative (DCI) P3 colors; and~~
~~(4) Has a contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85°, with or without a screen cover glass.~~

"Video Cassette Recorder (VCR)" means a commercially- available analog recording device that includes an integral power supply and which records television signals onto a tape medium for subsequent viewing.

"Video standby-passive mode" means the appliance is connected to a power source, does not perform any mechanical function (e.g. playing, recording), does not produce video or audio output signals but can be switched into another mode with the remote control unit or an internal signal.

"Viewable screen area" means the continuous total area of a television in square inches which displays a digital or analog video signal and is viewable to a consumer.

"Workstation" means a computer used for graphics, computer-aided design (CAD), software development, financial, or scientific applications, among other computation intensive tasks. A workstation covered by this specification must meet the following criteria:

(1) Product as shipped does not support altering frequency or voltage beyond the computer processing unit and GPU manufacturers' operating specifications;
(2) Has system hardware that supports error-correcting code (ECC) that detects and corrects errors with dedicated circuitry on and across the CPU, interconnect, and system memory; and
(3) Meets two or more of the following criteria:
  (A) Supports one or more discrete GPU or discrete compute accelerators.
  (B) Supports four or more lanes of PCI-express, other than discrete GPU, connected to accessory expansion slots or ports where each lane has a bandwidth of 8 gigabits per second (Gb/s) or more.
  (C) Provides multi-processor support for two or more physically separate processor packages or sockets. This requirement cannot be met with support for a single multi-core processor.
  (D) Has qualified or is currently being reviewed for qualification by two or more independent software vendor (ISV) product certifications.

(w) Battery Chargers and Battery Charger Systems.

"24 hour charge and maintenance energy" means the sum of the energy, in watt-hours, consumed by the battery charger system in charge and battery-maintenance mode when charging the battery over time periods as defined in the applicable test method in ~~S~~section 1604(w) of this Article. This time period may exceed 24 hours.

"À la carte charger" means a battery charger that is individually packaged without batteries. À la carte chargers include those with multi-voltage or multi-port capability.

"Battery" or "battery pack" means an assembly of one or more rechargeable cells intended to provide electrical energy to a product, and may be in one of the following forms: (a) detachable battery: a battery that is contained in a separate enclosure from the product and is intended to be removed or disconnected from the product for recharging; or (b) integral battery: a battery that is contained within the product and is not removed from the product for charging purposes.

"Battery analyzer" means a device:
(1) used to analyze and report a battery's performance and overall condition;
(2) capable of being programmed and performing service functions to restore capability in deficient batteries; and
(3) not intended or marketed to be used on a daily basis for the purpose of charging batteries.

"Battery backup" or "uninterruptible power supply charger (UPS)" means a small battery charger system that is voltage and frequency dependent (VFD) and designed to provide power to an end use product in the event of a power outage, and includes a UPS as defined in IEC 62040-3 ed.2.0. The output of the VFD upon which the UPS is dependent changes in AC input voltage and frequency and is not intended to provide additional corrective functions, such as those relating to the use of tapped transformers.

"Battery charger system (BCS)" means a battery charger coupled with its batteries or battery chargers coupled with their batteries, which together are referred to as *battery charger systems*. This term covers all rechargeable batteries or devices incorporating a rechargeable battery and the chargers used with them. Battery charger systems include, but are not limited to:
(1) electronic devices with a battery that are normally charged from AC line voltage or DC input voltage through an internal or external power supply and a dedicated battery charger;
(2) the battery and battery charger components of devices that are designed to run on battery power during part or all of their operations;
(3) dedicated battery systems primarily designed for electrical or emergency backup; and
(4) devices whose primary function is to charge batteries, along with the batteries they are designed to charge. These units include chargers for power tool batteries and chargers for automotive, AA, AAA, C, D, or 9 V rechargeable batteries, as well as chargers for batteries used in larger industrial motive equipment and à la carte chargers.

The charging circuitry of battery charger systems may or may not be located within the housing of the end-use device itself. In many cases, the battery may be charged with a dedicated external charger and power supply combination that is separate from the device that runs on power from the battery.

"Battery energy" means the energy, in watthours, delivered by the battery under the specified discharge conditions as determined using the applicable test method in ~~S~~section 1604(w) of this Article.

"Battery maintenance mode (maintenance mode)" means the mode of operation when the battery charger system is connected to the main electricity supply and the battery is fully charged, but is still connected to the charger.

"Charge return factor" means the number of ampere hours (Ah) returned to the battery during the charge cycle divided by the number of Ah delivered by the battery during discharge.

"Energy ratio" or "nonactive energy ratio" means the ratio of the accumulated nonactive energy divided by the battery energy.

"Federally regulated battery charger" means a device that charges batteries for consumer products, including battery chargers embedded in other consumer products. Backup battery chargers are not included as federally regulated battery chargers.

"Federally regulated uninterruptible power supply" (UPS) means a battery charger consisting of a combination of convertors, switches and energy storage devices (such as batteries), constituting a power system for maintaining continuity of load power in case of input power failure and that utilize the standardized National Electrical Manufacturer Association (NEMA) plug, 1-15P or 5-15P and have an AC output.

"Inductive charger system" means a small battery charger system that transfers power to the charger through magnetic or electric induction.

"Large battery charger system" means a battery charger system (other than a battery charger system for golf carts) with a rated input power of more than 2 kW.

"Multi-port charger" means a battery charger that is capable of simultaneously charging two or more batteries. These chargers also may have multi-voltage capability, allowing two or more batteries of different voltages to charge simultaneously.

"No battery mode" means the mode of operation when the battery charger is connected to the main electricity supply and the battery is not connected to the charger.

"Power conversion efficiency" means the instantaneous DC output power of the charger system divided by the simultaneous utility AC input power.

"Small battery charger system" means a battery charger system with a rated input power of 2 kW or less, and includes golf cart battery charger systems regardless of the output power.

~~"USB charger system" means a small battery charger system that uses a Universal Serial Bus (USB) connector as the only power source to charge the battery, and is packaged with an external power supply rated with a voltage output of 5 volts and a power output of 15 watts or less.~~

The following documents are incorporated by reference in ~~S~~section 1602.

Number	*Title*

FEDERAL STATUTES AND REGULATIONS

C.F.R., Title 10, sections 429.14(d), 429.16(a), and 429.61(d)
C.F.R., Title 10, section 430.2
C.F.R., Title 10, sections 431.25, 431.192, 431.344, 431.442, and 431.446
C.F.R., Title 10, part 430, ~~S~~subpart B
C.F.R., Title 10, part 431, ~~S~~subparts ~~B~~A through ~~W~~Y

Copies available from: Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
~~http://ecfr.gpoaccess.gov/~~www.ecfr.gov

ADOBE SYSTEMS INCORPORATED

Adobe RGB (1998) — Adobe RGB (1998) Color Image Encoding Version 2005-05 (May 2005)

Copies available from: Adobe Systems Incorporated
Corporate Headquarters
345 Park Avenue
San Jose, CA 95110-2704
~~(408) 536-6000~~
~~http://~~www.adobe.com
Phone: (408) 536-6000

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C78.1-1991 (R1996)	Dimensional and Electrical Characteristics of Fluorescent Lamps, Rapid Start Types
ANSI C78.3-1991 (R1996)	Dimensional and Electrical Characteristics of Fluorescent Lamps, Instant Start and cold Cathode Types
ANSI C78.21-1989	Incandescent Lamps – PAR and R Shapes
ANSI C78.81-2003	American National Standard for Electric Lamp Bases
ANSI C78.901-2014	American National Standard for Electric Lamps—Single-Based Fluorescent Lamps—Dimensional and Electrical Characteristics
ANSI C79.1-1994	Nomenclature for Glass Bulbs – Intended for Use with Electric Lamps
ANSI C79.1-2002	American National Standard for Electric Lamps—Nomenclature for Glass Bulbs Intended for Use with Electric Lamps
ANSI-IEC C81.61-2003	American National Standard for Electric Lamp Bases
ANSI C81.61-2006	Specifications for Electric Bases
ANSI ANSLG C81.61-2009 (2014)	American National Standard for Electrical Lamp Bases – Specifications for Bases (Caps) for Electric Lamps

ANSI C82.2-1984	Fluorescent Lamp Ballasts, Methods of Measurement
ANSI C82.6-2005	Standard for Ballasts for High-Intensity Discharge Lamps -Methods of Measurement
ANSI Z21.50	Vented Gas Fireplaces
ANSI Z21.88	Vented Gas Fireplace Heaters
Copies available from:	American National Standards Institute 1819 L Street, NW, 6th Floor Washington, DC 20036 www.ansi.org Phone: (202) 293-8020 FAX: (202) 293-9287

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C177-13	Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
ASTM C518-15	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM Standard E 1084-86 (Reapproved 2009)	Standard Test Method for Solar Transmittance (Terrestrial) of Sheet Materials Using Sunlight
Copies available from:	ASTM 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org Phone: (610) 832-9555 FAX: (610) 832-9555

ASSOCIATION OF HOME APPLIANCES MANUFACTURERS (AHAM)

ANSI/AHAM DW-1-1992	Household Electric Dishwashers
Copies available from:	Association of Home Appliance Manufacturers 1111 19th Street, NW, Suite 402 Washington, DC 20036 www.aham.org Phone: (202) 872-5955 FAX: (202) 872-9354

CANADIAN STANDARDS ASSOCIATION (CSA)

CSA C390-10	Test methods, marking requirements, and energy efficiency levels for three-phase induction motors

Copies available from:	Canadian Standards Association 178 Rexdale Blvd. Toronto, Ontario, Canada, M9W 1R3 Phone: (416) 747-4044 http:/shop.csa.ca/ ~~Phone: (416) 747-4044~~

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION (ECMA)

Ecma International Standard ECMA- 383 (2010)	Measuring the Energy Consumption of Personal Computing Products, 3rd edition (December 2010)
Copies available from:	ECMA International Rue du Rhone 114 – CH – 1204 Geneva ~~Tel~~Phone: +41 22 849 6000 FAX~~ax~~: +41 22 849 6001 http://www.ecmainternational.org/publications/standards/Categories_to_be_used_with_Ecma-383.htm http://www.ecma-international.org/publications/files/ECMA-ST/ECMA-383.pdf

FM GLOBAL (FM)

FM Class Number 1319 January 2015 edition	Approval Standard for Centrifugal Fire Pumps (Horizontal, End Suction Type)
Copies available from:	FM Global 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062 www.fmglobal.com Phone: (781) 762-4300

HDMI LICENSING ADMINISTRATOR, INC.

HDMI Specification Informational Version 1.0	High-Definition Multimedia Interface Specification
Copies available from:	HDMI Licensing Administrator, Inc. 550 S. Winchester Blvd., Ste. 515 San Jose, CA 95128 www.hdmi.org/

HYDRAULIC INSTITUTE (HI)

ANSI/HI 1.1-1.2-2014	Rotodynamic Centrifugal Pumps for Nomenclature and Definitions
ANSI/HI 2.1-2.2-2014	Rotodynamic Vertical Pumps of Radial, Mixed, and Axial Flow Types for Nomenclature and Definitions
Copies available from:	Hydraulic Institute 6 Campus Dr., First Floor North Parsippany, NJ 07054-4405 http://www.pumps.org/ www.hydraulicinstitute.com Phone: (973) 267-9700 FAX: (973) 267-9055

ILLUMINATING ENGINGEERING SOCIETY (IES)

IES LM-9-09	Electrical and Photometric Measurements of Fluorescent Lamps
IES LM-16-1993	IES Practical Guide to Colorimetry of Light Sources
IES LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI/IES RP-16-10	Nomenclature and Definitions for Illuminating Engineering
Copies available from:	Illuminating Engineering Society 120 Wall Street, 17th Floor New York, NY 10005-4001 www.ies.org Phone: (212) 248-5000 FAX: (212) 248-5017/18

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 802.3az-2010	IEEE Standard for Information technology-- Local and metropolitan area networks-- Specific requirements-- Part 3: CSMA/CD Access Method and Physical Layer Specifications Amendment 5: Media Access Control Parameters, Physical Layers, and Management Parameters for Energy Efficient Ethernet
Test Method B of IEEE Std 112-2004	IEEE Standard Test Procedure for Polyphase Induction Motors and Generators
Copies available from:	IEEE (TechStreet) Publications Office 10662 Los Vaqueros Circle PO Box 3014 Los Alamitos, CA 90720-1264 http://www.techstreet.com/ieee/ http://standards.ieee.org

INTERNATIONAL COMMISSION ON ILLUMINATION (CIE)

CIE Publication 13.3 1995	Method of Measuring and Specifying Colour Rendering Properties of Light Sources
Copies available from:	International Commission on Illumination CIE Central Bureau Kegelgasse 27 A-1030 Vienna AUSTRIA Phone: +43 1 714 31 87 0 FAX: +43 1 714 31 87 18 e-mail: ciecb@cie.co.at

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 60034-1 (1996)	Rotating Electrical Machines
IEC 60034-12 ~~(1980)~~	Rotating Electrical Machines, Part 12: Starting Performance of

Edition 2.1 2007-09	Single-Speed Three-Phase Cage Induction Motors for Voltages Up to and Including 660 V
IEC 60050-411 (1996)	International Electrotechnical Vocabulary Chapter 411: Rotating Machines
IEC 60072-1 (1991)	Dimensions and Output Series for Rotating Electrical Machines- Part 1: Frame Numbers 56 to 400 and Flange Numbers 55 to 1080
IEC 60297-3-101:2004	Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-101: Subracks and associated plug-in units
IEC 61966-2-1:1999	Multimedia systems and equipment –Colour measurement and management. Part 2-1: Colour management - Default RGB colour space - sRGB
Copies available from:	International Electrotechnical Commission 3, rue de Varembé P.O. Box 131 CH – 1211 Geneva 20 Switzerland http://www.iec.ch Phone: +41 22 919 02 11 FAX: +41 22 919 03 00

INTERNATIONAL TELECOMMUNICATION UNION (ITU)

ITU-R BT 470-6	Conventional Television Systems
Copies available from:	International Telecommunication Union Place des Nations 1211 Geneva 20 Switzerland www.itu.int Phone: +41 22 730 6141 FAX: + 41 22 730 5194

NATIONAL ELECTRIC CODE (NEC)

NFPA 20 (2016)	Standard for the Installation of Stationary Pumps for Fire Protection
ANSI/NFPA 70 (2002)	National Electrical Code
Copies available from:	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org Phone: (617) 770-3000 FAX: (617) 770-0700

NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG1-1967	Motors and Generators
NEMA MG1-1987	Motors and Generators
NEMA MG1-2009	Motors and Generators
NEMA Premium™: Product Scope and Nominal Efficiency Levels (2001)	Motors
Copies available from:	National Electric Manufacturers Association 1300 N. 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org Phone: (703) 841-3200 FAX: (703) 841-3300

NSF INTERNATIONAL

NSF/ANSI 51-2007	Food Equipment Materials
Copies available from:	NSF International Standards Department 789 Dixboro Road P. O. Box 130140 Ann Arbor, MI 48113-0140 www.nsf.org Phone: (734) 769-8010 FAX: (734) 769-0109

OPTICAL SOCIETY OF AMERICA (OSA)

Journal of Optical Society of America, Volume 58 (1968)

Copies available from:	Optical Society of America 2010 Massachusetts Ave., N.W. Washington, D.C. 20036-1012 USA www.osa.org Phone: 202.223.8130 FAX: 202.223.1096

SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS (SMPTE)

SMPTE 170M-2004	Television - Composite Analog Video Signal - NTSC for Studio Applications
Copies available from:	Society of Motion Picture and Television Engineers White Plains Plaza 445 Hamilton Ave, Ste 601 White Plains, NY 10106-1827 www.smpte.org Phone: (914) 761-1100 FAX: (914) 206-4216

UNDERWRITERS LABS (UL)

ANSI/UL 448-2013	Standard for Safety Centrifugal Stationary Pumps for Fire Protection Service
UL 588	Standard for Seasonal and Holiday Decorative Products
UL 1598	Standards for Luminaires
UL 1995	Heating and Cooling Equipment
Copies available from:	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com Phone: (847) 272-8800 FAX: (847) 272-8129

UNIFIED EXTENSIBLE FIRMWARE INTERFACE FORUM

Advanced Configuration and Power Interface Specification Revision 5.0 (December 6, 2011) and Advanced Configuration and Power Interface Specification Revision 5.0 Errata A (November 13, 2013)	Advanced Configuration and Power Interface Specification
Copies available from:	UEFI Forum Administration 3855 SW 153rd Drive Beaverton, OR 97003~~ USA~~ http://www.uefi.org Phone: +1 503-619-0864 FAX~~ax~~: +1 503-644-6708

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4, and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1602.1 Rules Of Construction.

(a) Where the context requires, the singular includes the plural and the plural includes the singular.

(b) The use of “and” in a conjunctive provision means that all elements in the provision must be complied with, or must exist in order to make the provision applicable. “Or” (rather than “and/or”) is used where compliance with one or more elements suffices, or where the existence of one or more elements makes the provision applicable.

(c) “Shall” is mandatory and “may” is permissive.

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-(c), and 25960, Public Resources Code.
Reference: Sections 25216.5(d), 25402(a)-(c), and 25960, Public Resources Code.

Section 1603. Testing: All Appliances

(a) Testing Requirements.

The manufacturer shall cause the testing of units of each basic model of appliance within the scope of ~~S~~section 1601 of this Article, using the applicable test method listed in ~~S~~section 1604 of this Article unless otherwise provided in subsection (c) of this section. If the manufacturer of the basic model does not participate in an approved industry certification program for the basic model, or does not apply such a program to test all units under this Article, the testing shall be at a laboratory that the Executive Director determines, under ~~S~~section 1608(i) of this Article, that:

(1) has conducted tests using the applicable test method within the previous 12 months;
(2) agrees to and does interpret and apply the applicable test method set forth in ~~S~~section 1604 of this Article precisely as written;
   (A) for laboratories testing federally regulated appliances and equipment, agrees to and does interpret and apply any applicable provisions of 10 C.F.R. ~~§~~section 429, ~~S~~subpart C;
(3) has, and keeps properly calibrated and maintained, all equipment, material, and facilities necessary to apply the applicable test method precisely as written;
(4) agrees to and does maintain copies of all test reports, and provides any such report to the Executive Director on request, for all basic models that are still in commercial production; and
(5) agrees to and does allow the Executive Director to witness any test of such an appliance on request, up to once per calendar year for each basic model.

~~EXCEPTION to section 1603(a): Section 1603(a) does not apply to any water heater:~~
~~(1) that is within the scope of 42 U.S.C. sections 6292(a)(4) or 6311(1)(F),~~
~~(2) that has a rated storage volume of less than 20 gallons, and~~
~~(3) for which there is no federal test method applicable to that type of water heater.~~

(b) Approved Industry Certification Programs.

(1) An "approved industry certification program" is an appliance certification program that has successfully applied through MAEDbS to become an approved industry certification program; and that the Executive Director has determined:
   (A) is operated by an appliance manufacturer trade association or other entity approved as an approved industry certification program by the Executive Director;
   (B) is accredited by ANSI or ISO, or has received from a nationally recognized entity an approval that provides substantially similar guarantees of substantive and procedural reliability and accuracy; and
   (C) provides:
      1. an internet-accessible listing of appropriate energy performance information that is updated at least every 6 months;
      2. testing of appliances according to applicable test methods and accurate reporting of test results;
      3. listings that:
         a. include no appliance not meeting an applicable federal standard,
         b. clearly and distinctly indicate which appliances meet the applicable federal standard but do not meet an applicable California standard, which shall be identified, and
         c. where there is no federal standard, clearly and distinctly indicate which appliances do not meet an applicable California standard which shall be identified; and
   (D verification of manufacturer-submitted data;
   (E) an appropriate procedure for program participants to challenge listed information; and
   (F) compatibility with the MAEDbS described in section 1606(c) of this Article.

(~~1~~2) The Executive Director shall, within 30 days of receiving a written request by an entity administering an appliance certification program, determine whether the program meets the criteria in ~~S~~section 160~~2~~3(~~a~~b)(1) of this Article. If the Executive Director determines that the program meets all the criteria, he or she shall designate the program as an approved industry certification program. The Executive Director shall periodically publish a list of all approved industry certification programs.

(~~2~~3) The Executive Director shall, within 30 days of receiving a written request, determine whether an approved industry certification program continues to meet the criteria in ~~S~~section 160~~2(a)~~3(b)(1) of this Article. If the Executive Director determines that the program meets all the criteria, the program shall remain on the list of approved industry certification programs published under ~~subparagraph~~ section 1603(b)(~~1~~2) of this Article. If the Executive Director determines that the program does not meet all the criteria, he or she shall remove the program from the list, and the program shall no longer be an approved industry certification program.

(c) Appliances for Which There Is a Waiver of the Federal Test Method.

(1) If, for a basic model of an appliance, there is in effect a waiver from an otherwise-applicable federal test method granted pursuant to 10 C.F.R. section 430.27, and the waiver is conditioned on adherence to an alternate test procedure pursuant to 10 C.F.R. section 430.27(l), then the manufacturer shall cause the testing of units of the basic model using such alternate test procedure, and such alternate test procedure shall be deemed to be the test method listed or specified in ~~S~~section 1604 of this Article for the basic model.

(2) If, for a basic model of an appliance, there is in effect a waiver from an otherwise-applicable federal test method granted pursuant to 10 C.F.R. section 430.27, and the waiver is not conditioned on adherence to an alternate test procedure pursuant to 10 C.F.R. section 430.27(l), then the manufacturer shall petition the Executive Director to specify:
   (A) an alternative assessment method; if the Executive Director so specifies, then the manufacturer shall cause the testing of units of the basic model of appliance using the alternative assessment method, and such alternative assessment method shall be deemed to be the test method listed or specified in ~~S~~section 1604 of this Article for the basic model; or
   (B) that there is no alternative assessment method, because either the basic model has physical characteristics that prevent testing or there is no method that can produce reasonably accurate results; if the Executive Director so specifies, then the manufacturer need not test units of the basic model and it shall be deemed that there is no test method listed or specified in ~~S~~section 1604 of this Article for the basic model.

The manufacturer of the basic model shall obtain a specification from the Executive Director before submitting a statement for the basic model pursuant to ~~S~~section 1606(a) of this Article.

The following document is incorporated by reference in ~~S~~section 1603.

Number	***Title***
FEDERAL STATUTES AND REGULATIONS	
C.F.R., Title 10, part 429, ~~S~~subpart C	
Copies available from:	Superintendent of Documents U.S. Government Printing Office Washington, DC 20402 ~~http://ecfr.gpoaccess.gov/~~www.ecfr.gov

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-(c), ~~25553(b)~~ and 25960, Public Resources Code. Reference: Sections 25216.5(d), 25402(a)-(c), ~~25553(b)~~ and 25960, Public Resources Code.

Section 1604. Test Methods for Specific Appliances.

(a) Refrigerators, Refrigerator-Freezers, and Freezers.

(1) The test methods for non-commercial refrigerators designed for the refrigerated storage of food at temperatures above 32°F and below 39°F, configured for general refrigerated food storage, non-commercial refrigerator-freezers, miscellaneous refrigeration products, and non-commercial freezers~~,~~ are 10 C.F.R. sections 430.23(a) (Appendix A to subpart B of part 430) and 430.23(b) (Appendix B to subpart B of part 430)~~shown in Table A-1~~.

~~**Table A-1**~~
~~**Non-Commercial Refrigerator, Refrigerator-Freezer, and Freezer Test Methods**~~

~~***Appliance***~~	~~***Test Method***~~
~~Non-commercial refrigerators, designed for the refrigerated storage of food at temperatures above 32°F and below 39°F, configured for general refrigerated food storage; refrigerator-freezers; and freezers.~~	~~10 C.F.R. sections 430.23(a) (Appendix A to Subpart B of part 430) and 430.23(b) (Appendix B to Subpart B of part 430)~~
~~Wine chillers that are consumer products~~	~~10 C.F.R. section 430.23(a) (Appendix A1 to Subpart B of part 430), with the following modifications:~~ ~~Standardized temperature as referred to in section 3.2 of Appendix A1 shall be 55°F (12.8°C).~~ ~~The calculation of test cycle energy expended (ET) in section 5.2.1.1 of Appendix A shall be made using the modified formula: ET=(EP x 1440 x k)/T~~ ~~Where k = 0.85~~

(2) The test methods for commercial refrigerators, commercial refrigerator-freezers, and commercial freezers are shown in Table A-1~~2~~.

Table A-1~~2~~
Commercial Refrigerator, Refrigerator-Freezer, and Freezer Test Methods

Appliance	***Test Method***
Automatic commercial ice makers	10 C.F.R. sections 431.133 and 431.134
Refrigerated bottled or canned beverage vending machines	10 C.F.R. sections 431.293 and 431.294
Refrigerated buffet and preparation tables	ANSI/ASTM F2143-01
Other commercial refrigerators, refrigerator-freezers, and freezers, with doors	10 C.F.R. sections 431.63 and 431.64
Other commercial refrigerators, refrigerator-freezers, and freezers, without doors	10 C.F.R. sections 431.63 and 431.64
Walk-in coolers and walk-in freezers	10 C.F.R. sections 431.303 and 431.304

(3) When a refrigerator, refrigerator-freezer, or freezer can be operated using either alternating current electricity or one or more other sources of primary power, the test shall be performed using alternating current electricity only.

(4) The test method for water dispensers is EPA Energy Star Program Requirements for Bottled Water Coolers (2004).

EXCEPTION to Section 1604(a)(4): ~~for units~~**Water dispensers equipped with an integral, automatic timer.** ~~Units~~Water dispensers equipped with an integral, automatic timer shall not be tested using Section 4)D, "Timer Usage," of the referenced test method.

(b) Room Air Conditioners, Room Air-Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.

The test methods for room air conditioners, room air-conditioning heat pumps, packaged terminal air conditioners, and packaged terminal heat pumps are shown in Table B-1.

Table B-1
Room Air Conditioner, Room Air-Conditioning Heat Pump, Packaged Terminal Air Conditioner, and Packaged Terminal Heat Pump Test Methods

Appliance	*Test Method*
Room air conditioners and room air-conditioning heat pumps	10 C.F.R. section 430.23(f) (Appendix F to ~~S~~subpart B of part 430)
Packaged terminal air conditioners and packaged terminal heat pumps	10 C.F.R. sections 431.95 and 431.96

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

(1) The test methods for central air conditioners are shown in Table C-1.

(2) Air-cooled central air conditioners with rated cooling capacity less than 65,000 Btu per hour that are designed for use either at 230 volts or at another voltage may be tested at 230 volts and the results applied to the other voltages. Central air conditioners that are designed for use either at 208 volts or at another voltage may be tested at 208 volts and the results applied to the other voltages.

(3) Split system central air conditioners and compressor-containing units shall be tested with the non-compressor-containing unit most likely to represent the highest national sales volume for the combined equipment.

Table C-1
Central Air Conditioner Test Methods

Appliance	***Test Method***
Computer Room Air Conditioners	
evaporatively- cooled	ANSI/ASHRAE 127-2001
air-cooled, glycol-cooled, water-cooled	10 C.F.R. sections 431.95 and 431.96
Other electric-powered unitary air-conditioners and electric-powered heat pumps	
air-cooled air conditioners and air-source heat pumps	
< 65,000 Btu/hr, single-phase	10 C.F.R. section 430.23(m) (Appendix M to ~~S~~subpart B of part 430)
< 65,000 Btu/hr, three-phase	10 C.F.R. sections 431.95 and 431.96
≥ 65,000 and < 760,000 Btu/hr	10 C.F.R. sections 431.95 and 431.96
evaporatively- cooled air conditioners < 240,000 Btu/hr	10 C.F.R. sections 431.95 and 431.96
water-cooled air conditioners and water-source heat pumps	
< 240,000 Btu/hr	10 C.F.R. sections 431.95 and 431.96
ground water-source heat pumps	ARI/ISO-13256-1:1998
ground-source closed-loop heat pumps	ARI/ISO-13256-1:1998
Variable Refrigerant Flow Multi-split Systems	10 C.F.R. sections 431.95 and 431.96
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps	10 C.F.R. sections 431.95 and 431.96
Gas-fired air conditioners and gas-fired heat pumps	ANSI Z21.40.4-1996 as modified by CEC, Efficiency Calculation Method for Gas-Fired Heat Pumps as a New Compliance Option (1996)

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

Table C-2
Air Filter Test Methods

Appliance	***Test Method***
Air Filter Pressure Drop	AHRI 680-2009* or ASHRAE 52.2-2012
Minimum Efficiency Reporting Value (MERV)	ASHRAE 52.2-2012
Air Filter Particle Size Efficiency	AHRI 680-2009* or ASHRAE 52.2-2012
Dust Holding Capacity	AHRI 680-2009* or ASHRAE 52.2-2012
* MERV not reportable for models being tested to AHRI 680-2009 only.	

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

(5) **Heat Pump Water Heating Packages.** Heat pump water-~~chilling~~heating 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.

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

The test methods for ~~spot~~portable air conditioners, evaporative coolers, ceiling fans, ceiling fan light kits, whole house fans, residential exhaust fans, ~~and~~ dehumidifiers, and residential furnace fans are shown in Table D-~~1~~3.

Table D-~~1~~3
~~Spot~~Portable Air Conditioner, Ceiling Fan, Ceiling Fan Light Kit, Evaporative Cooler, Whole House Fan, Residential Exhaust Fan, ~~and~~ Dehumidifier, and Residential Furnace Fan Test Methods

Appliance	*Test Method*
Spot Air Conditioners	ANSI/ASHRAE 128-2001
Single-Duct and Dual-Duct Portable Air Conditioners	10 C.F.R. section 430.23(dd) Appendix CC to subpart B of part 430
Ceiling Fans~~, Except Low-Profile Ceiling Fans~~	10 C.F.R. section 430.23(w) (Appendix U to ~~S~~subpart B of part 430)
Ceiling Fan Light Kits	10 C.F.R. section 430.23(x) (Appendix V to ~~S~~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-Publication 916 29 September 2015 HVI Airflow Test Procedure, as specified in section 5.2. Use setups for whole house comfort ventilators.
Dehumidifiers	10 C.F.R. section 430.23(z) (Appendix X to ~~S~~subpart B of part 430, active mode portion only)
Portable Dehumidifiers and Whole-Home Dehumidifiers Manufactured On or After June 13, 2019	10 C.F.R. section 430.23(z) (Appendix X1 to subpart B of part 430)
Residential Exhaust Fans	HVI-Publication 916 29 September 2015 HVI Airflow Test Procedure, as specified in section 5.2.
Residential Furnace Fans	10 C.F.R. section 430.23(cc) (Appendix AA to ~~S~~subpart B of part 430)

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

(1) **Gas Space Heaters and Oil Space Heaters.** The test methods for gas space heaters and oil space heaters are shown in Table E-1.

(2) **Natural Gas and LPG Space Heaters.** Gas space heaters intended for use either with natural gas or LPG may be tested with natural gas and the results applied to both fuel types.

(3) **Combination Space-Heating and Water-Heating Appliances.** The test method for combination space-heating and water-heating appliances is ANSI/ASHRAE 124-2007.

Table E-1
Gas and Oil Space Heater Test Methods

Appliance	*Test Method*
Central furnaces < 225,000 Btu/hr, single phase	10 C.F.R. section 430.23(n) (Appendix N to ~~S~~subpart B of part 430)
< 225,000 Btu/hr, three phase	10 C.F.R. section 430.23(n) (Appendix N to ~~S~~subpart B of part 430) or 10 C.F.R. sections 431.75 and 431.76 (at manufacturer's option)
≥ 225,000 Btu/hr	10 C.F.R. sections 431.75 and 431.76
Gas infrared heaters patio heaters ~~gas-fired~~ high-intensity infrared heaters ~~gas-fired~~ low-intensity infrared heaters	ASTM F2644-07 ANSI Z83.19-2001 ANSI Z83.20-2001
~~Unit heaters~~ ~~gas-fired~~ ~~oil-fired~~	 ~~ANSI Z83.8-2002*~~ ~~UL 731-1995*~~
Gas duct furnaces	ANSI Z83.8-2002
Boilers < 300,000 Btu/hr ≥ 300,000 Btu/hr	 10 C.F.R. section 430.23(n) (Appendix N to ~~S~~subpart B of part 430) 10 C.F.R. sections 431.85 and 431.86
Wall furnaces, floor furnaces, and room heaters	10 C.F.R. section 430.23(o) (Appendix O to ~~S~~subpart B of part 430)
~~*To calculate maximum energy consumption during standby, measure the gas energy used in one hour (in Btus) and the electrical energy used (in watt-hours) over a one-hour period, when the main burner is off. Divide Btus and watt-hours by one hour to obtain Btus per hour and watts. Divide Btus per hour by 3.412 to obtain watts. Add watts of gas energy to watts of electrical energy to obtain standby energy consumption in watts.~~	

(f) Water Heaters.

(1) ~~**Small Water Heaters:** The test methods for small water heaters are shown in Table F-1.~~

Residential Water Heaters: The test method for residential water heaters is 10 C.F.R. section 430.23(e) (Appendix E to subpart B of part 430).

~~Table F-1~~
~~Small Water Heater Test Methods~~

~~*Appliance*~~	~~*Test Method*~~
~~Small water heaters that are federally-regulated consumer products~~	~~10 C.F.R. part 430, Subpart B, Appendix E, section 5: "Test Procedures" and part 430.23(e)(4): "The alternative uniform test method for measuring the energy consumption of untested water heaters shall be that set forth in section 7.0 of Appendix E of this subpart."~~
~~Small water heaters that are not federally-regulated consumer products~~	
~~— Gas and oil storage-type < 20 gallons rated capacity~~	~~ANSI/ASHRAE 118.2-1993~~
~~— Booster water heaters~~	~~ANSI/ASTM F2022-00 (for all matters other than volume) ANSI Z21.10.3-1998 (for volume)~~
~~— Hot water dispensers~~	~~Test Method in 1604(f)(4)~~
~~— Mini-tank electric water heaters~~	~~Test Method in 1604(f)(5)~~
~~— All others~~	~~10C.F.R. section 430.23(e) (Appendix E to Subpart B of part 430)~~

(2) ~~Large w~~**Water heaters that are Regulated Under subpart G of 10 C.F.R. part 431**.

~~(A)~~ The test methods for ~~large~~ water heaters that are regulated under subpart G of 10 C.F.R. part 431~~, except for large heat pump water heaters,~~ are found at 10 C.F.R. sections 431.105 and 431.106.

~~(B) There is no test method for large heat pump water heaters.~~

(3) **Dual-Fuel Models.** Water heaters intended for use either with natural gas or LPG may be tested with natural gas and the results applied to both fuel types.

~~(4) **Hot Water Dispensers.** The test method for hot water dispensers is as follows:~~

~~(A) Connect the hot water dispenser to a water supply, a power supply and a means of measuring energy use. Fill the hot water dispenser with water and apply the power supply. Control the ambient temperature in the laboratory at 77°F ± 7°F throughout the test.~~

~~(B) Let the unit operate in standby mode for at least 2 complete cycles of thermostat operation, with the thermostat set to 150°F ± 10°F as described below.~~

~~(C) If the thermostat is adjustable, set it to produce water at 150°F ± 10°F, determined by discharging 5 oz. of water into an insulated cup immediately after a thermostat cut out, then measuring its temperature.~~

~~(D) If the thermostat is adjustable, and the temperature is not within the tolerance shown in Step B, readjust the thermostat and allow it to operate in standby mode for 2 cycles, measuring the discharge temperature immediately after the second cut out, as described above.~~

~~(E) After the thermostat has been properly adjusted, allow the unit to operate in standby mode for a minimum of 2 cycles, then measure the electricity used (in Wh) during the next 24 hours (plus time for first cut out after 24 hours). Begin measuring electricity usage immediately after a thermostat cut out, and end just after the first thermostat cut out after 24 hours. The total length of the test will be~~

somewhat longer than 24 hours, depending on the first cut out after 24 hours. Divide the measured electricity used (in Wh) by the time (in hours), to obtain the standby loss (in watts).

(F) Record the water temperature measured in Step D and the standby loss calculated in Step E.

(5) **Mini-Tank Electric Water Heaters**. The test method for mini-tank electric water heaters is as follows:

(A) Storage Tank Volume

Determine the storage capacity of the water heater, in gallons, by subtracting the weight of the empty water heater from the weight of the water heater when completely filled with water (with all air eliminated and line pressure applied) and dividing the resulting net weight by the density of water at the measured temperature.

$$V = \frac{Wf - Wt}{\rho}$$

Where:

V = the storage capacity in gallons
Wf = the weight of the water heater when full (lb)
Wt = the weight of the empty water heater (lb)
ρ = the density of the water (lb/gal)

(B) Test Set-Up

1. Insulate the water piping, including heat traps, if provided by the manufacturer, for a length of 4 feet from the connection to the appliance with material having a thermal resistance I value of not less than 4°F x ft² x hr/Btu. Ensure that the insulation does not contact any water heater surface except at the location where the pipe connections penetrate the appliance jacket.

2. If the manufacturer has not provided a temperature and pressure relief valve, one shall be installed and insulated.

3. Maintain the temperature of the supply water at 70°F ± 2°F and the pressure of the water supply between 40 psi and the maximum pressure specified by the manufacturer. The accuracy of the pressure measuring devices shall be within ± 1.0 pound per square inch. The water heater shall be isolated by use of a shut-off valve in the supply line with an expansion tank installed in the supply line downstream of the shutoff valve. There shall be no shut-off means between the expansion tank and the appliance inlet.

4. Before starting testing of the water heater, the setting of the thermostat shall first be obtained by supplying the water in the system at 70°F ± 2°F and then noting the maximum mean temperature of the water after the thermostat shuts off the electric supply to be 142°F ± 8°F.

5. For measuring the energy consumption, instrumentation shall be installed which measures within ± 2 percent. Voltage shall be within ± 10 percent of the rated voltage.

6. Three or more temperature sensing means shall be installed inside the storage tank on the vertical center of each of three or more nonoverlapping sections of approximately equal volume from the top to the bottom of the tank. Each temperature sensing means is to be located as far as possible from any heat source or other irregularity, anodic protective device, or water tank or flue wall. The anodic protective device shall be removed in order to install the temperature sensing means and testing shall be carried out with the device removed. If the temperature sensing means cannot be installed as specified above, placement of the temperature sensing means shall be made at the discretion of the testing agency so that comparable water temperature measurements are obtained.

A temperature sensing means, shielded against direct radiation and positioned at the vertical midpoint of a tank-type water heater at a perpendicular distance of approximately 24 inches from the surface of the jacket, shall be installed in the test room.

7. The ambient air temperature of the test room shall be maintained at 75°F ± 10°F. The ambient temperature shall not vary more than ± 7.0°F from the average during the test, temperature readings being taken at 15 minute intervals and averaged at the end of the test.

(C) First Hour Rating, F_{hr}, gallons/hr

Heat the water to mean water temperature of 142°F ± 8°F. Draw hot water at 0.6 gpm±0.1 gpm until the mean water temperature drops 25°F, while recording the water temperature every 5 seconds. Maintain the supply water temperature at 70°F ± 2°F. Measure the volume of water drawn, (F_{hr}), which is the first hour rating F_{hr}.

(D) Standby Loss

Fill the water heater with water. Turn on the electric power to the water heater. After the first cut out, allow the water heater to remain in the standby mode until the next cut out. At this time, record the time, ambient temperature and begin measuring the electric consumption. Record the maximum mean tank temperature that occurs after cut out.

Record the mean tank temperature and the ambient air temperature at the end of the first 15 minute interval and at the end of each subsequent 15 minute interval. The duration of this test shall be until the first cut out that occurs after 24 hours.

Immediately after the conclusion of the test, record the total electrical energy consumption, the final ambient air temperature, and the time duration of the standby loss test (t) in hours rounded to the nearest one hundredth of an hour and the maximum mean tank temperature that occurs after cut out. Calculate the average of the recorded values of the mean tank temperatures and of the ambient air temperatures taken at the end of each time interval, including the initial and final values. Determine the difference (<<delta>>T_3) between these two averages by subtracting the latter from the former, and the differences (<<delta>>T_4) between the final and initial mean tank temperatures by subtracting the latter from the former.

Standby Loss (% per hour).

Determine the percentage standby loss using the formula:

$$S = \left[\frac{E \times 3412}{(K)(V)(\Delta T_3)(t)} - \frac{(\Delta T_4)}{(\Delta T_3)(t)(E_r/100)} \right] \times 100$$

Where:

S = standby loss, percent per hour, expressed as a ratio of the heat loss per hour to the heat content of the stored water above room temperature
K = 8.25 Btu per gallon°F, the nominal specific heat of water
V = tank capacity expressed in gallons
3412 = conversion factor, 1 kWh = 3412 Btu
ΔT_3 = difference between the mean tank temperature and the average ambient air temperature,°F
ΔT_4 = difference between the final and initial mean tank temperature,°F
t = duration of test, hrs.
E = electrical energy consumption in kWh

~~E_r = recovery efficiency, assumed to be 98% for water heaters with immersed heating elements~~

~~(E) Calculations~~

~~Determine the Recovery Efficiency (E_r) using the following formula:~~

$$E_r = 1 - \frac{(S \times K \times V \times \Delta T_2)}{(P \times 3412\ Btu/kWh)}$$

~~Where:~~

~~S = standby loss, hr^{-1}~~
~~ΔT_2 = 45°F, the nominal difference between the mean tank temperature and the ambient air temperature during recovery~~
~~P = Rated input, kW~~
~~K = 8.25 Btu per gallon°F, the nominal specific heat of water~~
~~V = tank capacity expressed in gallons~~
~~3412 = conversion factor from kWh to Btu/hr~~

~~Determine the Standby Loss (W) using the formula:~~

~~$W = S \times K \times V (\Delta T_1) / (3412\ Btu/kWh)$~~
~~Where:~~

~~ΔT_1 = 70°F, the nominal difference between mean tank temperature and the average ambient air temperature~~
~~S = standby loss, hr^{-1}~~
~~K = 8.25 Btu per gallon°F, the nominal specific heat of water~~
~~V = tank capacity expressed in gallons~~
~~3412 = conversion factor from kWh to Btu/hr~~

~~Determine the Daily Water Heating Energy Consumption, (C_{wh}) using the formula:~~

$$C_{wh} = \frac{K \times U \times \Delta T_5}{E_r}$$

~~Where:~~

~~U = 12 gallons, daily water use~~
~~ΔT_5 = 72°F, difference in outlet and inlet water temperatures~~
~~K = 8.25 Btu per gallon°F, the nominal specific heat of water~~
~~E_r = recovery efficiency, assumed to be 98%~~

~~Determine the Average Hourly Hot Water Storage Energy Consumption, (C_{us}) using the formula:~~

$$C_{us} = S \times K \times V \times \Delta T_1$$

~~Where:~~

~~ΔT_1 = 70°F, the nominal difference between the mean tank temperature and the ambient air temperature during standby~~
~~S = standby loss, hr^{-1}~~
~~K = 8.25 Btu per gallon°F, the nominal specific heat of water~~
~~V = tank capacity expressed in gallons~~

~~Determine the Average Daily Energy Consumption for Electric Water Heaters, (C_y) using the formula:~~

~~$C_y = C_{wh} + C_{us} \times \frac{24 \text{ hrs}}{\text{day}} - \frac{C_{wh}}{P \times 3412 \text{ Btu/kWh}}$~~

~~Where:~~

~~$C_{wh} = \frac{K \times U \times \Delta T_5}{E_r}$~~
~~$C_{us} = S \times K \times V \times \Delta T_1$~~
~~P = Rated input, kW~~
~~3412 = conversion factor from kWh to Btu/hr~~

~~Determine the Daily Hot Water Energy Consumption, (C_e) using the formula:~~

~~$C_e = K \times U \times \Delta T_5$~~

~~Where:~~

~~K = 8.25 Btu per gallon°F, the nominal specific heat of water~~
~~U = 12 gallons, daily water use~~
~~ΔT_5 = 72°F, the nominal difference between the outlet and inlet water temperatures~~

~~Determine the Annual Energy Consumption, kBtu/year (E_{annual}) using the formula:~~

~~$E_{annual} = \frac{C_y \text{ Btu/day} \times 365 \text{ days/yr}}{1000}$~~

~~(F) Report the following values:~~

~~Measured Volume, V~~	~~=~~	~~gallons~~
~~First Hour Rating, F_{hr}~~	~~=~~	~~gallons/hr~~
~~Rated electrical input, P~~	~~=~~	~~kW~~
~~Size (overall dimensions)~~	~~=~~	~~inches (h x w x d)~~
~~Recovery Efficiency, E_r~~	~~=~~	~~%~~
~~Standby Loss, S~~	~~=~~	~~%/hr~~
~~Standby Loss~~	~~=~~	~~watts~~
~~Annual Energy Consumption, E_{annual}~~	~~=~~	~~kBtu~~

(g) Pool Heaters, Portable Electric Spas, Pumps, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.

(1) **Test Methods for Pool Heaters.**

The test method for fossil fuel-fired pool heaters, electric resistance pool heaters, and electric heat pump pool heaters is 10 C.F.R. section 430.23(p) (Appendix P to subpart B of part 430).
~~The test methods for pool heaters are shown in Table G-1.~~

~~Table G-1~~
~~Pool Heater Test Methods~~

~~Appliance~~	***~~Test Method~~***

~~Gas-fired and oil-fired pool heaters~~	~~10 C.F.R. section 430.23(p) (Appendix P to Subpart B of part 430)~~
~~Electric resistance pool heaters~~	~~ANSI/ASHRAE 146-1998~~
~~Heat pump pool heaters~~	~~ANSI/ASHRAE 146-1998, as modified by Addendum Test Procedure published by Pool Heat Pump Manufacturers Association dated April, 1999, Rev 4: Feb. 28, 2000:~~

~~***Reading***~~	~~***Standard Temperature Rating***~~	~~***Low-Temperature Rating***~~	~~***Spa Conditions Rating***~~
~~Air Temperature~~ ~~Dry-bulb~~ ~~Wet bulb~~	~~27.0°C (80.6°F)~~ ~~21.7°C (71.0°F)~~	~~10.0°C (50.0°F)~~ ~~6.9°C (44.4°F)~~	~~27.0°C (80.6°F)~~ ~~21.7°C (71.0°F)~~
~~Relative Humidity~~	~~63%~~	~~63%~~	~~63%~~
~~Pool Water Temperature~~	~~26.7°C (80.0°F)~~	~~26.7°C (80.0°F)~~	~~40.0°C (104.0°F)~~

(2) **Test Method for Portable Electric Spas.**

The test method for portable electric spas is as follows:

(A) Minimum continuous testing time shall be 72 hours.

(B) The spa shall be filled with water to the halfway point between the bottom of the skimmer basket opening and the top of the spa. If there is no skimmer basket, the spa shall be filled with water to six inches below the top of the spa.

(C) The water temperature shall be 102°F, ± 2°F for the duration of the test.

(D) The ambient air temperature shall be 60°F, ± 3°F for the duration of the test.

(E) The standard cover that comes with the unit shall be used during the test.

(F) The test shall start when the water temperature has been at 102°F,± 2°F for at least four hours.

(G) Record the total energy use for the period of test, starting at the end of the first heating cycle after the stabilization period specified in ~~S~~section 1604(g)(2)(F) of this Article, and finishing at the end of the first heating cycle after 72 hours has elapsed.

(H) The unit shall remain covered and in the default operation mode during the test. Energy-conserving circulation functions, if present, must not be enabled if not appropriate for continuous, long-term use. Ancillary equipment including, but not limited to lights, audio systems, and water treatment devices, shall remain connected to the mains but may be turned off during the test if their controls are user accessible.

(I) The measured standby power shall be normalized to a temperature difference of 37°F using the equation,

$$P_{norm} = P_{meas} \frac{\Delta T_{ideal}}{\Delta T_{meas}}$$

Where:

P_{meas} = measured standby power during test (E/t)
ΔT_{ideal} = 37°F
$\Delta T_{meas} = T_{water\ avg} - T_{air\ avg}$
$T_{water\ avg}$ = Average water temperature during test
$T_{air\ avg}$ = Average air temperature during test.

(J) Data reported shall include: spa identification (make, model, S/N, specifications); volume of the unit in gallons; supply voltage; minimum, maximum, and average water temperatures during test; minimum, maximum, and average ambient air temperatures during test; date of test; length of test (t, in hours); total energy use during the test (E, in Wh); and normalized standby power (P_{norm}, in watts).

(3) **Test Method for Residential Pool Pumps.**

The test method for residential pool pumps is as follows:

(A) Reported motor efficiency shall be verifiable by test method IEEE 114-2001.

(B) ANSI/HI 1.6-2000 shall be used for the measurement of pump efficiency.

(C) Three curves shall be calculated:

Curve A: $H = 0.0167 \times F^2$

Curve B: $H = 0.050 \times F^2$

Curve C: $H = 0.0082 \times F^{2.2}$

Where:

H is the total system head in feet of water.

F is the flow rate in gallons per minute (gpm).

(D) For each curve (A, B, or C), the pump head shall be adjusted until the flow and head lie on the curve. The following shall be tested and reported (i) for each curve for single-speed pumps or (ii) for each curve at both highest and lowest speeds for two-, multi-, or variable-speed pumps:

1. Motor nominal speed (RPM)
2. Flow (gallons per minute)
3. Power (watts and volt amps)
4. Energy Factor (gallons per watt hour)

Where the Energy Factor (EF) is calculated as:

EF = Flow (gpm) * 60 / Power (watts)

(4) **Test Method for Pumps**

The test method for pumps is 10 C.F.R. section 431.464 (Appendix A to subpart Y of part 431).

(h) Plumbing Fittings.

(1) **Commercial Pre-Rinse Spray Valves.** The test method for commercial pre-rinse spray valves is 10 C.F.R. sections 431.263 and 431.264.

(2) **Showerheads.** The test methods for showerheads are:

(A) **Maximum flow rate test.** The test method for determining maximum flow rate of a showerhead is 10 C.F.R. Section 430.23(t) (Appendix S to ~~S~~subpart B of P~~p~~art 430).
(B) **Minimum flow rate test.** The test method for determining minimum flow rate of a showerhead is ASME A112.18.1-2012 / CSA B125.1-2012, Section 5.12.
(C) **Showerheads with multiple nozzles.** Showerheads with multiple nozzles shall be tested with all nozzles in use at the same time.

(3) **Other Plumbing Fittings.** The test method for other plumbing fittings is 10 C.F.R. Section 430.23(s) (Appendix S to ~~S~~subpart B of P~~p~~art 430).

(4) **Showerhead-tub spout diverter combinations.** Showerhead-tub spout diverter combinations shall have both the showerhead and tub spout diverter tested individually.

(5) ~~A tub spout diverter manufactured before June 1, 2016 shall be tested per 10 C.F.R. section 430.23(s) (Appendix S to Subpart B of part 430).~~

~~(6)~~ **Tub Spout Diverters.** A tub spout diverter manufactured on or after June 1, 2016 shall be tested in accordance with ASME A112.18.1-2012/CSA B125.1-12, Section 5.3.6 for the rate of leakage conducted prior to life cycle testing and Section 5.6.1.5 for the rate of leakage conducted after life cycling testing.

(i) Plumbing Fixtures.

(1) **Water Closets.** The test method for testing gallons per flush of water closets is 10 C.F.R. Section 430.23 (u) (Appendix T to ~~S~~subpart B of part 430). See ~~S~~section 1604(i)(3) of this Article for the required waste extraction test.

(2) **Urinals.** The test method for testing gallons per flush of urinals is 10 C.F.R. Section 430.23(v) (Appendix T to ~~S~~subpart B of part 430).

(3) **Waste Extraction Test.** The waste extraction test method for water closets is Section 7.10 of ASME A112.19.2/CSA B45.1-2013.

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

(1) **Fluorescent Lamp Ballasts Except Deep-Dimming Fluorescent Lamp Ballasts.** The test method for fluorescent lamp ballasts is 10 C.F.R. section 430.23(q) (Appendix Q to ~~S~~subpart B of part 430) ~~as applicable for models manufactured before November 14, 2014~~.

~~(2) The test method for fluorescent lamp ballasts is 10 C.F.R. section 430.23(q) (Appendix Q1 to Subpart B of part 430) as applicable for models manufactured on or after November 14, 2014.~~

~~(3)~~(2) **Deep-Dimming Fluorescent Lamp Ballasts.** Deep-dimming fluorescent lamp ballasts shall be tested using 10 C.F.R. Section 430.23(q) (Appendix Q to ~~S~~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:

1. 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;

2. 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;

3. 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.

4. 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.

(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.

(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_o. The measurement must be taken 90 minutes after entering this state. P_o shall be recorded as the mean value of measurements taken at 5 second intervals over a 5-minute period.

(D) The weighted ballast luminous efficacy shall be calculated using the following formula and table:

$$Weighted\ ballast\ luminous\ efficacy = BLE_{100} \times w_{100} + BLE_{80} \times w_{80} + BLE_{50} \times w_{50}$$

Where the time values (w_{100}, w_{80}, w_{50}) are taken from the appropriate table below:

Table J-1
Percentage Time of Operation Table

Time Variable	Measurements taken			
	P_{80}, P_{50}	P_{80}, ~~n~~No P_{50}	No P_{80}, P_{50}	No P_{80}, No P_{50}
w_{100}	0.2	0.35	0.45	1
w_{80}	0.5	0.65	0	0
w_{50}	0.3	0	0.55	0

(k) Lamps.

(1) The test method for federally-regulated general service fluorescent lamps, federally-regulated general service incandescent lamps, and federally-regulated incandescent reflector lamps is 10 C.F.R. section 430.23(r) (Appendix R to ~~S~~subpart B of part 430).

(2) The test method for ~~state-regulated general service incandescent lamps, state regulated incandescent reflector lamps, and~~ state-regulated small diameter directional lamps that use incandescent filament technology is 10 C.F.R. section 430.23(r) (Appendix R to ~~S~~subpart B of part 430).

(3) The test method for medium base compact fluorescent lamps is 10 C.F.R. section 430.23(y) (Appendix W to ~~S~~subpart B of part 430).

(4) The test methods for LED state-regulated small diameter directional lamps and state-regulated LED lamps are ~~contained~~ shown in Table K-1. For certification, compliance, and enforcement purposes, the sampling provisions in ~~80 Fed. Reg. 39664-39665 (July 9, 2015)~~ 10 C.F.R. section 429.56 shall be used.

Table K-1
Test Methods for State-Regulated LED Lamps and
LED State-Regulated Small Diameter Directional Lamps

Measurement	***Test Procedure***	***Required or Optional***
Input power, Lumen output, LPW~~Lumens per Watt~~, Correlated Color Temperature, Duv, Color Rendering Index, Power Factor	IES LM-79 (2008) with additional requirements provided in ~~80 Fed. Reg. 39665-39666 (July 9, 2015), §~~10 C.F.R. section 430.23(~~dd~~ee) ~~and~~ (Appendix BB to ~~S~~subpart B of ~~P~~part 430).	Required
Lumen Maintenance and Time to Failure	IES LM-84 (2014) and TM-28 (2014) with additional requirements provided in ~~80 Fed. Reg. 39665-39667 (July 9, 2015), §~~10 C.F.R. section 430.23(~~dd~~ee) ~~and~~ (Appendix BB to ~~S~~subpart B of ~~P~~part 430).	Required
Standby Power	~~IEC 62301 (2011) with additional requirements provided in 80 Fed. Reg. 39667 (July 9, 2015)~~10 C.F.R. section 430.23(ee) (Appendix BB to subpart B of ~~P~~part 430). ~~and with the following additional requirements for connected LED lamps:~~ ~~(A) Ensure that the lamp is connected to only one network type and the lamp is in Network Mode~~ ~~(i) If lamp has ability to connect to multiple networks, only one network shall be tested, and the network selected for testing shall be selected using the following prioritization:~~ ~~1.Wi-Fi~~ ~~2.ZigBee~~ ~~3.ANT~~ ~~4.Bluetooth~~ ~~5.RF~~ ~~6.Wired~~ ~~7.Other~~ ~~(B) Measure standby power as described in section 5.3.2 of IEC 62301 (2011) for a total period of no less than 60 minutes.~~ ~~(i) Standby power shall be measured at a lamp that is a distance of 10 meters (+/- 0.5 meters) from the hub, or wireless controller if no hub exists. If connection is not possible at this distance, conduct testing within 1 meter of the maximum connection distance.~~ ~~(C) To calculate standby power, divide the accumulated energy consumption in watt-hours by the duration of the test in hours. Record this value as the average Network Standby Power.~~ ~~For lamps that are not connected LED lamps, record this value as "not applicable."~~	Required
Flicker	Title 24, part 6, Joint Appendix 10 (2015), tested at both 100% and 20% output. Lamps with a percent amplitude modulation (percent flicker) less than 30 percent at frequencies less than 200Hz shall report "yes" for "reduced flicker operation" described in section 1606 of this Article, otherwise report "no."	Optional
Lumen Maintenance, Rated Life, and Survival Rate for Compliance with Title 24 Joint Appendix 8 and minimum dimming level	Title 24, part 6, Joint Appendix 8 (2015).	Optional

Audible Noise	ENERGY STAR Recommended Practice – Noise (2013) with the following modification: measurements shall be taken at 100 percent output as well as at 20 percent output if dimmable.	Optional

*Required test procedures must be conducted per section 1603(a) of this Article for each basic model of lamp. Optional test procedures are conditionally required depending on manufacturer claims of performance as described in sections 1607(d)(12) of this Article and 1606 ~~t~~Table X of this Article.

(5) There are no federally prescribed test methods for ~~federally-regulated light-emitting diode (LED) lamps,~~ federally regulated organic light-emitting diode (OLED) lamps; federally regulated candelabra base incandescent lamps, or federally regulated intermediate base incandescent lamps.

(l) Emergency Lighting and Self-Contained Lighting Controls.

(1) **Emergency Lighting.** The test method for illuminated exit signs is 10 C.F.R. section 431.204(b).

(2) **Self-Contained Lighting Controls.** There is no test method for self-contained lighting controls.

(m) Traffic Signal Modules ~~and Traffic Signal Lamps~~.

~~(1)~~ **Traffic Signal Modules.** The test method~~s~~ for traffic signal modules for vehicle or pedestrian control ~~are~~ is 10 C.F.R. section 431.224.

~~(2) There is no test method for traffic signal lamps.~~

(n) Luminaires and Torchieres.

(1) **Torchieres.**

There is no test method for torchieres.

(2) **Metal Halide Luminaires.**

The test method for metal halide luminaires is ANSI C82.6-2005. Ballasts may be tested separately, outside the luminaire. A sample of at least five ballasts shall be tested for each lamp wattage for which the luminaire and ballasts are rated. The average of these tests shall be used for certification and compliance purposes.

Ballasts efficiency for High Intensity Discharge (HID) luminaire means the efficiency of a lamp and ballast combination expressed as a percentage and calculated by Efficiency = P_{out} / P_{in}, as measured. P_{out} is the measured operating lamp wattage and P_{in} is the measured operating input wattage.

The lamp, and the capacitor when it is provided, is to constitute a nominal system in accordance with ANSI C78.43-2004~~2005~~. P_{in} and P_{out} are to be measured after lamps have been stabilized according to Section 4.4 of ANSI C82.6-2005 using a wattmeter with accuracy specified in Section 4.5 of ANSI C82.6-2005 for ballasts with a frequency of 60 Hz and shall have a basic accuracy of ± 0.5 percent at the higher of (a.) three times the output operating frequency of the ballast, or (b.) 2 kHz for ballast with a frequency greater than 60 Hz.

(3) **Under-Cabinet Luminaires.**

The test method for under-cabinet luminaires is 10 C.F.R. 430.23(q) (Appendix Q to subpart B of part 430 (2015)).

(4) **Portable Luminaires.**

(A) The test methods for LED luminaires using LED lamps are shown in Table K-1 of section 1604(k)(4) of this Article.

(B) The test methods for LED luminaires using LED ~~lamps and~~ light engines are California Joint Appendix JA8 – 2008, "Testing of Light Emitting Diode Light Sources," or IES LM-79-08, "Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products," at manufacturer's option.

(o) Dishwashers.

The test method for dishwashers is 10 C.F.R. section 430.23(c) (Appendix C1 to ~~S~~subpart B of part 430).

(p) Clothes Washers.

(1) **Clothes Washers That Are Consumer Products.** The test method~~s~~ for clothes washers that are consumer products ~~and commercial clothes washers~~ is 10 C.F.R. section 430.23(j) (Appendix J2 to ~~S~~subpart B of part 430).

(2) **Commercial Clothes Washers.**

(A) **Testing Before January 1, 2018.** The test method for commercial clothes washers before January 1, 2018 is 10 C.F.R. section 430.23(j) (Appendix J1 to subpart B of part 430).

(B) **Testing On or After January 1, 2018.** The test method for commercial clothes washers on or after January 1, 2018 is 10 C.F.R. section 430.23(j) (Appendix J2 to subpart B of part 430).

(q) Clothes Dryers.

The test method~~s~~ for clothes dryers ~~is~~are 10 C.F.R. section 430.23(d) (Appendix D1 or Appendix D2 to ~~S~~subpart B of part 430). Manufacturers must use a single appendix for all representations, including certifications of compliance, and may not use appendix D1 for certain representations and appendix D2 for other representations.

(r) Cooking Products and Food Service Equipment.

The test methods for cooking products that are consumer products, commercial hot food holding cabinets, commercial convection ovens and commercial range tops are shown in Table R-1.

Table R-1
Cooking Product and Food Service Equipment Test Methods

Appliance	*Test Method*
Cooking products that are consumer products	10 C.F.R. section 430.23(i) (Appendix I to ~~S~~subpart B of part 430)
Combined cooking products	10 C.F.R. section 430.23(i) (Appendix I to Subpart B of part 430)
Commercial hot food holding cabinets	ANSI/ASTM F2140-01 (Test for idle energy rate-dry test) and US EPA's Energy Star Guidelines, "Measuring Interior Volume" (Test for interior volume)
Commercial convection ovens	ANSI/ASTM F1496-99 (Test for energy input rate and idle energy consumption only)
Commercial range tops	ANSI/ASTM F1521-96 (Test for cooking energy efficiency only)

(s) Electric Motors and Compressors.

(1) **Electric Motors, Except Small Electric Motors.** The test methods for electric motors are 10 C.F.R. sections 431.15, 431.16, 431.17, 431.18, 431.19, 431.20, and 431.21, including but not limited to provisions on testing laboratories, recognition of accreditation bodies, and recognition of certification programs.

(2) **Small Electric Motors.** The test methods for small electric motors are 10 C.F.R. sections 431.443, 431.444 and 431.445, including but not limited to provisions on alternative efficiency determination method (AEDM) and additional testing requirements concerning selection of models to be tested if an AEDM is to be applied.

(3) **Compressors.** The test method for compressors is 10 C.F.R. section 431.344 (Appendix A to Subpart T of 10 C.F.R., § 431).

(t) Distribution Transformers.

The test method for distribution transformers is 10 C.F.R. section 431.193 (Appendix A of ~~S~~subpart K).

(u) External Power Supplies.

(1) The test method for federally regulated direct operation external power supplies and federally regulated indirect operation Class A ~~federally regulated~~ external power supplies is 10 C.F.R. section 430.23(bb) (Appendix Z to ~~S~~subpart B of part 430).

(2) The test method for state-regulated external power supplies is US EPA "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" dated August 11, 2004, except that the test voltage specified in Section 4(d) of the test method shall be only 115 volts, 60 Hz.

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

(1) **Consumer Audio and Video Equipment.** The test method for standby-passive mode consumer audio and video equipment is International Electrotechnical Commission (IEC) 62087:2002(E) – "Methods of Measurement for the Power Consumption of Audio, Video, and Related Equipment."

(2) **Televisions and Signage Displays.** The test method for televisions manufactured on or after April 24, 2014 is 10 C.F.R. section 430.23(h) (Appendix H to ~~S~~subpart B of part 430). The test method for signage displays manufactured on or after April 24, 2014, is 10 C.F.R. Section 430.23(h) (Appendix H to ~~S~~subpart B of part 430) (January 1, 2014).

~~(3) The test method for televisions manufactured before April 24, 2014 is as follows:~~

~~(A) The test method for standby-passive mode for televisions is International Electrotechnical Commission (IEC) 62301:2005, Edition 1.0 "Household Electrical Appliances—Measurement of Standby Power."~~

~~(B) The on mode and power factor test method for televisions shall be International Electrotechnical Commission (IEC) 62087:2008(E), Edition 2.0 "Methods of Measurement for the Power Consumption of Audio, Video, and Related Equipment." Televisions shall be tested using section 11.6.1: "On mode (average) testing with dynamic broadcast-content video signal."~~

~~(1) The power factor of the television shall be measured during the on mode test and the reported value shall be the average of power factor measurements taken at one minute intervals simultaneous to IEC 62087:2008(E), Edition 2.0 section 11.6.1 on mode wattage measurements. The measurement of power factor must be accurate to a hundredth of a percent.~~

~~(2) A television shall be tested as manufactured without any modifications to screen settings with the exception of televisions manufactured with a forced menu. Televisions manufactured with a forced menu shall be adjusted and tested under the following conditions, 1 or 2, as applicable to the unit being tested.~~

~~i. The on mode measurement of a television with a forced menu shall be tested in the "home" mode or the manufacturer's recommended mode for home use. In addition, the on mode of a television shall be measured in the most energy consumptive mode available in the forced menu.~~

~~ii. If neither a "home" mode nor a manufacturer's recommended mode for home use are available, the television shall be tested in the most consumptive mode available in the forced menu to measure the on mode power.~~

~~(3) The on mode power consumption for televisions with and without forced menus, and incorporating automatic brightness controls, shall be calculated as follows:~~

~~$P_{a1\_broadcast} = 0.55 * P = 0.55 * P_{o\_broadcast} + 0.45 * P_{abe\_broadcast}$~~

~~Where:~~

~~$P_{o\_broadcast}$ = on mode power test with 300 lux entering the light sensor~~

~~$P_{abe\_broadcast}$ = on mode power test with 0 lux entering the light sensor.~~

~~(4) All luminance testing shall be performed in dark room conditions. The display screen illuminance measurement (E) in TV standby-passive mode must be less than or equal to 1.0 lux. Measurements should be taken perpendicular to the center of the display screen using a Light Measuring Device (LMD).~~

~~Measurements shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognized state of the art measurement methods. Measurements shall also be made with the Automatic Brightness Control function, if such a function exists, disabled. If the Automatic Brightness Control function exists and cannot be disabled, then measurements shall be performed with light entering directly into the ambient light sensor at a level between 300 lux and 400 lux.~~

~~i. Ensure the television is set to the Home mode, or the default mode as shipped.~~

~~ii. Immediately following the on mode power testing using the dynamic broadcast content video signal as outlined in Section 1604(v)(3) display the three bar video signal provided in IEC 62087 Edition 2.0, Section 11.5.5, which displays three bars of white (100%) over a black (0%) background.~~

~~Iii. After the three bar video signal has been displayed for 10 minutes, measure the luminance (L_{home}). See *Note 1.*~~

~~Iv. Within 1 minute of measuring L_{home}, set the television to Retail mode, or the brightest selectable preset mode, and display the three bar video signal.~~

~~V. After the three bar video signal has been displayed for an additional 10 minutes, measure the luminance (L_{high}). See *Note 2.*~~

~~Vi. Calculate and report the luminance ratio by dividing L_{home} by L_{high}.: Luminance ratio = L_{home}/L_{high}.~~

~~**Note 1:** For television sets that are known to stabilize within 10 minutes, this duration may be reduced if the resulting measurement can be shown to be within 2% of the result that would otherwise be achieved using the full 10 minute duration.~~

~~**Note 2:** When possible, measurements of luminance shall be made without changing the LMD's measurement position on the display when switching between the home mode and retail mode. If this is not possible, the tester should replicate the measurement position of the LMD so that measurements in the home mode and retail mode are in the same position on the display.~~

(~~4~~3) **Computer Monitors.** The test method for computer monitors is the ENERGY STAR Program Requirements for Displays, Final Test Method (September 2015), with the following modifications:

(A) On mode measurements shall be made using the IEC 62087: 2011 and computer monitor sleep mode and computer monitor off mode measurements shall be made using the IEC 62301:2011, as specified in the ENERGY STAR Program Requirements for Displays, Final Test Method (September 2015).

(B) A computer monitor shall be tested as required by the test procedure for each of the following:
1. On mode power draw.
2. Computer monitor sleep mode power draw.
3. Computer monitor off mode power draw.

(C) Product features and functions not specifically addressed by the test method shall be turned off or disconnected. Built-in speakers shall be muted or turned down to their lowest volume setting for the on mode power draw test.

(D) Before starting the test procedure for measuring on mode power draw, any feature unrelated to the display of images (for example USB hubs, webcams, speakers, LAN connections, and SD card readers) shall be turned off.

(~~5~~4) **Computers.** The test method for computers is the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016), with the following modifications:

(A) Settings regarding hard-disk spinning shall not be altered from the default as-shipped settings.

(B) The total annual energy consumption of a computer shall be calculated using Equation 1 in Section 3 of the ENERGY STAR Program Requirements for Computers, Eligibility Criteria Version 6.1 (Rev. March-2016).

1. Computers manufactured before July 1, 2021 shall use the "conventional" mode weighting of Table 3 for a desktop computer, a mobile gaming system, a small-scale server, a high expandability computer, or a thin client, or Table 4 for a notebook computer, a mobile workstation, or a portable all-in-one computer, contained within Section 3 of the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016) , unless they meet either the criteria in Section 1604(v)(~~54~~)(B)(~~2~~). of this Article to use "full capability" mode weighting, or the criteria in Section 1604(v)(~~54~~)(B)(~~3~~). of this Article to use "remote wake."
2. In order to use the "full capability" mode weighting a computer shall have the following features enabled as shipped:
   a. Maintain Ethernet (IEEE 802.3-2015) or wireless (IEEE 802.11-2012) network addresses and network connection capability while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode;
   b. Resume from ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode upon request from outside the local network; and
   c. Support advertising host services and network name while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode.
3. In order to use the "remote wake" mode weighting a computer shall have the following features enabled as shipped:
   a. Maintain Ethernet (IEEE 802.3-2015) or wireless (IEEE 802.11-2012) network addresses and network connection capability while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode; and
   b. Resume from ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode upon request from outside the local network.
4. Computers manufactured on or after July 1, 2021, shall use the "conventional" mode weighting of Table 3 for a desktop computer, a mobile gaming system, a small-scale server, a high-expandability computer, or a thin client, or Table 4 for a notebook computer, a mobile workstation, or a portable all-in-one computer, contained within Section 3 of the ENERGY STAR Program Requirements for Computers, Eligibility Criteria Version 6.1 (Rev. March-2016).
5. Workstations shall calculate total annual energy consumption using the weighting of Table 8, contained within Section 3 of the ENERGY STAR Program Requirements for Computers, Eligibility Criteria Version 6.1 (Rev. March-2016).

(C) The expandability score calculation shall be included in test reports and shall be calculated as follows:

1. Identify the score for each individual interface type as determined by Table V-1 and then multiply by the total number of occurrences of that particular interface type present in the system as sold or offered for sale. Finally, sum the subtotals for all interface types.
2. Each instance of an interface may only receive one score.
3. Add 100 to the score.

Table V-1
Interface Types and Scores for Expandability Score Calculation

Interface Type	*Interface Score*
USB 2.0 or less	5
USB 3.0 or 3.1 Gen 1	10
USB 3.1 Gen 2	15
USB ports or Thunderbolt 3.0 or greater that can provide 100 or more watts of power	100
USB ports or Thunderbolt 3.0 or greater that can provide from 60 or more to less than 100 watts of power	60
USB ports or Thunderbolt 3.0 or greater that can provide from 30 or more to less than 60 watts of power	30

Thunderbolt 3.0 or greater or USB ports that are not otherwise addressed in Table V-1 and that cannot provide 30 or more watts of power	20
Unconnected USB 2.0 motherboard header	10 per header
Unconnected USB 3.0 or 3.1 Gen 1 motherboard header	20 per header
PCI slot other than PCIe x16 (only count mechanical slots)	25
PCIe x16 or higher (only count mechanical slots)	75
Thunderbolt 2.0 or less	20
M.2 (except key M)	10
IDE, SATA, eSATA	15
M.2 key M, SATA express, U.2	25
Integrated liquid cooling	50
Either: 1) CPU and motherboard support for 4 or more channels of system memory and at least 8 GB of installed and compatible system memory; or 2) At least 8 GB of system memory installed on a 256 bit or greater memory interface.	100

(D) A computer monitor used in the testing of desktop computers shall have a native resolution of at least 1920x1080 pixels and use progressive scanning. The computer operating system shall be set to operate at a minimum of 1920x1080 pixels and progressive scanning. If multiple display connections are available on the computer, choose the correct connection using the following criteria:

1. If hybrid graphics is available, choose the port that enables hybrid graphics.
2. If a discrete GPU is installed, choose a connection to the first GPU, except for where it conflicts with subdivision (D)(1) of this section.
3. If no discrete GPU is installed, choose a connection to a port integrated into the motherboard.
4. If there are multiple connector ports to choose from pursuant to subdivisions (v)(5)(D)1. through (v)(5)(D)3. of this section, connect the display to a port using the first available from the port types listed below:
    a. Display Port
    b. HDMI
    c. DVI
    d. VGA
    e. Other

(E) An integrated desktop computer, mobile gaming system, or notebook computer shall be tested using the integrated display's native resolution.

(F) High expandability computers shall be configured for the test in a manner identical to desktop computers. Mobile gaming systems and mobile workstations shall be configured for the test in a manner identical to notebook computers.

(G) For purposes of providing data as required in ~~S~~section 1606 of this Article, desktop computers, thin clients, mobile gaming systems, notebook computers, and portable all-in-ones shall be tested by selecting the configuration that has the greatest allowable energy consumption as provided for in ~~S~~section 1605.3(v)(5) of this Article. If multiple configurations exist that meet this criteria, select the configuration that will yield the greatest annual energy consumption as measured by the test procedure.

(H) The computer sleep mode power measurement shall be tested in a modified manner from the test procedure described in IEC 62623:2012. Instead of measuring power after manually entering sleep mode, the power measurement shall begin no sooner than 30 minutes and no later than 31 minutes of user inactivity on the unit under test. This measurement shall be performed after the long-idle test without altering the unit under test.

(I) The power factor of a computer power supply and compliance with Table V-9 in Section 1605.3(v)(6) of this Article shall both be determined by the following test procedure: Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies Revision 6.7 (March 1,

2014). In addition the median power factor during short-idle measurements shall be recorded in the test report.

(w) Battery Chargers and Battery Charger Systems.

(1) **Test Method for Federally Regulated Battery Chargers and Federally Regulated Uninterruptible Power Supplies**. The test method for federally regulated battery chargers and federally regulated uninterruptible power supplies is 10 C.F.R. section 430.23(aa) (Appendix Y to subpart B of part 430).

~~(1)~~(2)**Test Method for Small Battery Charger Systems.** The test method for small battery charger systems that are not federally regulated battery chargers, federally regulated uninterruptible power supplies, battery backups, or non-federally regulated uninterruptible power supplies is 10 C.F.R. section 430.23(aa) (Appendix Y to ~~S~~subpart B of part 430) (Jan. 1, 2017).

(A) Multi-port battery charger systems shall be tested for 24-hour efficiency and maintenance mode with a battery in each port.

(B) For single port small battery charger systems, the highest 24-hour charge and maintenance energy, maintenance mode, and no battery mode results of the test procedure shall be used for purposes of reporting and determining compliance with ~~S~~section 1605.3(w)(2), Table W-~~2~~3 of this Article.

(C) For purposes of computing the small battery charger system standard, the number of ports included in a multi-port charger system shall be equal to the number ports that are separately controlled. For example a multi-port charger system that charges eight batteries by using two charge controllers that charge four batteries in parallel would use two for "N" as described in ~~S~~section 1605.3(w)(2), Table W-~~2~~3 of this Article.

(D) Small battery charger systems that are not consumer products may use the battery manufacturer's recommended end of discharge voltage in place of values in 10 CFR ~~S~~section 420.23(aa) (Appendix Y to ~~S~~subpart B of ~~P~~part 430) (~~2011~~Jan.1, 2017), Table ~~5.2~~ 3.3.2, where the table's values are not applicable.

(3) **Test Method for Battery Backups and Non-Federally Regulated Uninterruptible Power Supplies.** The test method for battery backups and non-federally regulated uninterruptible power supplies is 10 C.F.R. section 430.23(aa) (Appendix Y to subpart B of part 430) (Jan. 1, 2016).

~~(2)~~(4) **Test Method for Large Battery Charger Systems**. The test method for large battery charger systems that are not federally regulated battery chargers or federally regulated uninterruptible power supplies is *Energy Efficiency Battery Charger System Test Procedure* Version 2.2 dated November 12, 2008 and published by ECOS and EPRI Solutions with the following modifications:

(A) The test procedure shall be conducted for 100, 80, and 40 percent discharge rates for only one charge profile, battery capacity, and battery voltage. The manufacturer shall test one battery and one charge profile using the following criteria:

1. the charge profile with the largest charge return factor;

2. the smallest rated battery capacity; and

3. the lowest voltage battery available at that rated capacity.

(B) The battery manufacturer's recommended end of discharge voltage may be used in place of values in the test method ~~P~~part 1, ~~S~~section III.F, Table D where the table's values are not applicable.

The following documents are incorporated by reference in ~~S~~section 1604.

CALIFORNIA ENERGY COMMISSION TEST METHODS

CEC/Gas-Fired Heat Pumps	Efficiency Calculation Method for Gas-Fired Heat Pumps as a Exceptional Method (1996) New Compliance Option (1996)
California Title 24, ~~P~~part 6, Joint Appendix 8 JA-8 - 2015	Qualification Requirements for High Efficacy Light Sources
California Title 24, ~~P~~part 6, Joint Appendix 10 JA-10 - 2015	Test Method for Measuring Flicker of Lighting Systems and Reporting Requirements
California Joint Appendix JA8 – 2008	Testing of Light Emitting Diode Light Sources
Copies available from:	California Energy Commission Energy Hotline 1516 Ninth Street, MS-25 Sacramento, California 95814 Phone: (916) 654-5106 FAX: (916) 654-4304

FEDERAL TEST METHODS

C.F.R, Title 10, section 430.23(aa) (Appendix Y of subpart B of part 430 (Jan. 1, 2016)
C.F.R, Title 10, section 430.23(aa) (Appendix Y of subpart B of part 430 (Jan. 1, 2017)
C.F.R., Title 10, section 429.56
C.F.R., Title 10, section 430.23, and 10 C.F.R. Appendixes A, B, C1, D1, D2, E, F, H, I, J1, J2, M, N, O, P, Q, R, S, T, U, V, W, X, S1, Y, Z, AA, BB, and CC of subpart B of part 430
C.F.R., Title 10, sections 431.15, 431.16, 431.17, 431.18, 431.19, 431.20, and 431.21
C.F.R., Title 10, sections 431.63 and 431.64
C.F.R., Title 10, sections 431.75 and 431.76
C.F.R., Title 10, sections 431.85 and 431.86
C.F.R., Title 10, sections 431.95 and 431.96
C.F.R., Title 10, sections 431.105 and 431.106
C.F.R., Title 10, sections 431.133 and 431.134
C.F.R., Title 10, section 431.193
C.F.R., Title 10, section~~s 431.203 and~~ 431.204(b)
C.F.R., Title 10, section~~s 431.223 and~~ 431.224
C.F.R., Title 10, sections 431.263 and 431.264
C.F.R., Title 10, sections 431.293 and 431.294
C.F.R., Title 10, sections 431.303 and 431.304
C.F.R., Title 10, section 431.344
C.F.R., Title 10, sections 431.443, 431.444, and 431.445
C.F.R., Title 10, section 431.464
C.F.R., Title 10, section 431 subpart G

Copies available from:	Superintendent of Documents U.S. Government Printing Office Washington, DC 20402 ~~http://ecfr.gpoaccess.gov/~~www.ecfr.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

	~~EPA Energy Star~~ENERGY STAR® Program Requirements for Bottled Water Coolers (2004)
	ENERGY STAR® Program Requirements for Computers, subparts Eligibility Criteria Version 6.1 (Rev. March- 2016) and Final Test Method (Rev. March-2016)

	ENERGY STAR® Program Requirements for Displays, subpart Final Test Method (Rev. Sep-2015)
	EPA "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" August 11, 2004)
	Energy Star Guidelines, "Measuring Interior Volume" (Test for measuring interior volume of commercial hot food holding cabinets)
ENERGY STAR Recommended Practice – Noise (2013)	EPA ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) Version 1.1 (August 2014).
Copies available from:	US EPA Climate Protection Partnership ENERGY STAR Programs Hotline & Distribution (MS-6202J) 1200 Pennsylvania Ave NW Washington, DC 20460 www.energystar.gov
~~80 Federal Register 39664-39667 (July 9, 2015)~~	~~Energy Conservation Program: Test Procedures for Integrated Light-Emitting Diode Lamps, Proposed Rule~~
~~Copies available from:~~	~~Office of the Federal Register 800 North Capitol Street, NW Suite 700 Washington DC 20001 Phone: (202) 741-6000 FAX: 202 741-6012 www.energystar.gov~~

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C78.43-2004~~2005~~	American National Standards for Electric Lamps - Single-Ended Metal Halide Lamps
ANSI C82.6-2005	Ballasts for High Intensity Discharge Lamps – Method of Measurement
ANSI Z21.10.3-1998	Standard for Gas Water Heaters, Volume III, Storage Water Heaters with Input Ratings Above 75,000 Btu per hour, Circulating and Instantaneous
ANSI Z21.40.4-1996	Performance Testing and Rating of Gas-Fired Air-Conditioning and Heat Pump Appliances
ANSI Z83.8-2002	Standard for Gas Unit Heaters and Gas-Fired Duct Furnaces
ANSI Z83.19-2001	Standard for Gas-Fired High-Intensity Infrared Heaters

ANSI Z83.20-2001	Standard for Gas-Fired Low-Intensity Infrared Heaters
ANSI/AHRI 550-590 (I-P) 2011	Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle
Copies available from:	American National Standards Institute 1819 L Street, NW, 6th Floor Washington DC 20036 www.ansi.org Phone: (202) 293-8020 FAX: (202) 293-9287

~~THE~~ AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A112.19.2/CSA B45.1-2013	Ceramic Plumbing Fixtures
ASME A112.18.1-2012/ CSA B125.1-2012	Plumbing Supply Fittings
Copies available from:	ASME HEADQUARTERS TWO PARK AVENUE NEW YORK, NY 10016-5990 WWW.ASME.ORG PHONE: 800-843-276~~23~~ (U.S./CANADA) 001-800-843-2763 (MEXICO) 973-882-1170 (OUTSIDE NORTH AMERICA) EMAIL: CUSTOMERCARE@ASME.ORG

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ANSI/ASTM F1496-99	Standard Test Method for Performance of Convection Ovens
ANSI/ASTM F1521-96	Standard Test Methods for Performance of Range Tops
~~ANSI/ASTM F2022-00~~	~~Standard Test Method for Performance of Booster Water Heaters~~
ANSI/ASTM F2140-01	Standard Test Method for the Performance of Hot Food Holding Cabinets
ANSI/ASTM F2143-01	Standard Test Method for the Performance of Refrigerated Buffet and Preparation Tables
ASTM F2644-07	Standard Test Method for Performance of Commercial Patio Heaters
Copies available from:	ASTM 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org Phone: (610) 832-9585 FAX: (610) 832-9555

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
ANSI/ASHRAE 118.2-1993	Method of Testing for Rating Residential Water Heaters
ANSI/ASHRAE 124-2007	Method of Testing for Rating Combination Space-Heating and Water-Heating Appliances
ANSI/ASHRAE 127-2001	Method of Testing for Rating Computer and Data Processing Room Unitary Air-Conditioners
ANSI/ASHRAE 128-2001	Method of Rating Spot Unitary Air Conditioners
ANSI/ASHRAE 133-~~2001~~2008	Method of Testing Direct Evaporative Air Coolers
ANSI/ASHRAE 143-~~2000~~2007	Method of Test for Rating Indirect Evaporative Coolers

ANSI/ASHRAE 146-1998	Method of Testing and Rating Pool Heaters
Copies available from:	American Society of Heating, Refrigerating, and Air-Conditioning Engineers 1791 Tullie Circle N.E. Atlanta, GA 30329 www.ashrae.org Phone: (800) 527-4723 (U.S./Canada) or (404) 636-8400 FAX: (404) 321-5478

ECOS CONSULTING

	Energy Efficiency Battery Charger System Test Procedure Version 2.2 dated November 12, 2008
Copies available from:	Ecos Consulting 801 Florida Road, # 11 Durango, CO 81301 http://www.efficientproducts.org/ Phone: (970) 259-6801 FAX: (970) 259-8585

ECOVA

	Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies Revision 6.7 (March 1, 2014)
Copies available from:	Plug Load Solutions by Ecova www.plugloadsolutions.com Phone: (971) 201-4180

HOME VENTILATING INSTITUTE (HVI)

HVI-Publication 916	29 September 2015 HVI Air-flow Test Procedure
Copies available from:	Home Ventilating Institute 1000 N. Rand Rd., Suite 214 Wauconda, IL 60084 www.hvi.org Phone: (847) 526-2010 FAX: (847) 526-3993

HYDRAULIC INSTITUTE (HI)

ANSI/HI 1.6-2000	Centrifugal Pump Tests
Copies available from:	Hydraulic Institute ~~9 Sylvan Way~~6 Campus Dr., First Floor North Parsippany, NJ 07054-4405 http://www.pumps.org/ www.hydraulicinstitute.com Phone: (973) 267-9700 FAX: (973) 267-9055

ILLUMINATING ENGINGEERING SOCIETY (IES)

IES LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
IES LM-84-14	Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and ~~Luminaries~~Luminaires.
IES TM-28 (2014)	Projecting Long-Term Luminous Flux Maintenance of LED Lamps and Luminaires
Copies available from:	Illuminating Engineering Society 120 Wall Street, 17th Floor New York, NY 10005-4001 www.ies.org Phone: (212) 248-5000 FAX: (212) 248-5017/18

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 62087 (2002) (E)	Methods of Measurement for the Power Consumption of Audio, Video, and Related Equipment.
IEC 62087:2008(E), Edition 2.0	Methods of Measurement for the Power Consumption of Audio, Video, and Related Equipment
~~IEC 62301:2005~~	~~Household Electrical Appliances – Measurement of Standby Power~~
~~IEC 62301 (2011) (E)~~	~~Household electrical appliances - Measurement of standby power~~
IEC 62087: 2011	Methods of measurement for the power consumption of audio, video and related equipment
IEC 62301:2011	Household electrical appliances – Measurement of standby power
IEC 62623:2012	Desktop and notebook computers – Measurement of energy consumption
Copies available from:	IEC Central Office 3, rue de Varembé P.O. Box 131 CH – 1211 GENEVA 20 Switzerland Phone: +41 22 919 02 11

INTERNATIONAL ORGANIZATION FOR STANDARDS (ISO)

ISO 13256-1-1998	Water-source heat pumps-Testing and rating for performance- Ppart 1: Water-to-air and brine-to-air heat pumps
Copies available from:	ISO Central Secretariat International Organization for Standardization (ISO) 1, rue de Varembé, Case postale 56 CH-1211 Geneva 20, Switzerland www.iso.org Phone: +41 22 749 01 11 FAX: +41 22 733 34 30

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 114-2001	Standard Test Procedures for Single-Phase Induction Motors
IEEE 802.3-2015	IEEE Standard for Ethernet
IEEE 802.11-2012	IEEE Standard for Information technology-- Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
Copies available from:	Institute of Electrical and Electronics Engineers Publications Office 10662 Los Vaqueros Circle PO Box 3014 Los Alamitos, CA 90720-1264 www.ieee.org

Phone: (714) 821-8380
Fax: (714) 821-4010

~~**POOL HEAT PUMP MANUFACTURERS ASSOCIATION**~~

~~Addendum Test Procedure – April 1999, Rev. 4: Feb. 28, 2000~~

~~Copies available from:~~ ~~Pool Heat Pump Manufacturers Association~~
~~Jeff Tawney, President~~
~~c/o Aquacal~~
~~2737 24th Street, North~~
~~St. Petersburg, FL 33713~~
~~Phone: (727) 823-5642 Ext. 130~~

~~**UNDERWRITERS LABORATORIES, INC. (UL)**~~

~~UL 731-1995~~ ~~Standard for Safety for Oil-Fired Unit Heaters~~
~~Copies available from:~~ ~~Underwriters Laboratories, Inc.~~
~~333 Pfingsten Road~~
~~Northbrook, IL 60062-2096~~
~~www.ul.com~~
~~Phone: (847) 272-8800~~
~~FAX: (847) 272-8129~~

UNIFIED EXTENSIBLE FIRMWARE INTERFACE FORUM

Advanced Configuration and Power Interface Specification Revision 5.0 (December 6, 2011) and Advanced Configuration and Power Interface Specification Revision 5.0 Errata A (November 13, 2013)	Advanced Configuration and Power Interface Specification
Copies available from:	UEFI Forum Administration 3855 SW 153rd Drive Beaverton, OR 97003 USA ~~http~~://www.uefi.org Phone: +1 503-619-0864 FAX~~ax~~: +1 503-644-6708

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1605. Energy Performance, Energy Design, Water Performance, and Water Design Standards: In General.

(a) **California Standards that are the Same as Federal Standards.** Section 1605.1 of this Article contains standards that are the same as the federal standards contained in, or adopted in regulations pursuant to, NAECA or EPAct.

(1) The standards in ~~S~~section 1605.1 of this Article are applicable as federal law to the sale of appliances in California and the rest of the United States. The standards apply to federally-regulated consumer products and federally-regulated commercial and industrial equipment. Under 42 U.S.C. sections 6302(a)(5), 6316(a), and 6316(b)(1), which are enforced by the U.S. Department of Energy, no appliance listed in this ~~S~~section may be sold in the United States unless the appliance complies with the applicable standard listed in this Section as determined using the applicable test method listed in ~~S~~section 1604 of this Article, and with all other requirements of federal law.

(2) Each standard in ~~S~~section 1605.1 of this Article is also adopted in this Article as California state law applicable to the sale and offering for sale of appliances in California, if the corresponding federal standard is repealed or becomes inoperable, inapplicable, or otherwise invalid as federal law. Immediately upon the effect of such federal repeal or invalidity the standard becomes effective as California state law, and no appliance previously covered by the federal standard shall be sold or offered for sale in the state unless the appliance complies with the state standard as determined using the applicable test method listed in ~~S~~section 1604 of this Article, and with all other requirements of this Article. Provided, however, that if a waiver from federal preemption is required for a standard in ~~S~~section 1605.1 of this Article, the state standard takes effect as California state law only on the effective date of a U.S. Department of Energy waiver from federal preemption.

(b) **California Standards for Federally-Regulated Appliances.** Section 1605.2 of this Article contains standards that are exclusively California standards. They are applicable as state law to the sale and offering for sale of appliances in California. Because the standards apply to federally-regulated appliances, they take effect as state law only on

(1) the effective date of a U.S. Department of Energy waiver from federal preemption; or

(2) one year after removal of federal preemption by action such as a change in federal law, but no earlier than July 1, 2004. When an applicable standard in ~~S~~section 1605.2 of this Article takes effect as state law, no appliance may be sold or offered for sale in California unless the appliance complies with the standard as determined using the applicable test method in ~~S~~section 1604 of this Article (and with all the other applicable requirements of this Article).

(c) **California Standards Applicable to Sale and Installation.** Section 1605.3 of this Article contains standards that are exclusively California standards. They are applicable as state law to the sale or offering for sale of appliances in California. No appliance may be sold or offered for sale in California unless the appliance complies with the applicable standard in ~~S~~section 1605.3 of this Article as determined using the applicable test method listed in ~~S~~section 1604 of this Article (and with all the other requirements of this Article).

(d) **Multiple Standards.** If more than one standard is shown for an appliance in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the appliance shall meet all the standards shown.

(e) **Multiple Test Methods.** If more than one test method is shown as applicable to a standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the appliance shall comply with the standard when tested with each and every individual specified test method, except for those appliances where the appropriate provision in section 1604 of this Article specifically allows a choice of test method at the manufacturer's option.

(f) **Multiple Functions.** If an appliance can serve more than one function, such as ~~either~~ space-heating and service water-heating then:

(1) if the primary function is served by a federally- regulated appliance, the primary function appliance shall meet the applicable standard in ~~S~~section 1605.1 of this Article; and

(2) if the primary function is served by an appliance that is not a federally- regulated appliance, the primary function appliance shall meet the applicable standard in ~~S~~section 1605.2 or ~~S~~section 1605.3 of this Article; and the secondary function appliances shall meet the applicable standards in ~~S~~sections 1605.1, 1605.2, and 1605.3 of this Article. Water heaters that are federally- regulated appliances, and that are contained in combination space-heating and water-heating appliances that are federally- regulated appliances, are required only to meet the standard for the applicable type of water heater, and are not required to meet any standard for space heaters.

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-(c), and 25960, Public Resources Code. Reference: Sections 25216.5(d), 25402(a)-(c), and 25960, Public Resources Code.

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

(a) Refrigerators, Refrigerator-Freezers, and Freezers.

(1) **Non-Commercial Refrigerators, Non-Commercial Refrigerator-Freezers, and Non-Commercial Freezers.**

(A) The energy consumption of non-commercial refrigerators designed for the refrigerated storage of food at temperatures above 32°F and below 39°F, configured for general refrigerated food storage, non-commercial refrigerator-freezers, and non-commercial freezers, including ~~internal freezers,~~ drawer units, and kitchen units that are manufactured on or after the effective dates shown shall be not greater than the applicable values shown in Table A-~~3~~2.

Table A-32

Standards for Non-Commercial Refrigerators, Refrigerator-Freezers, and Freezers

Appliance	Defrost	Compact, Built-in, Neither	Ice		Maximum Energy Consumption (kWh/year)	
			Equipped with Automatic Ice Maker?	Dispense Ice Through Door?	July 1, 2001[1]	Sept. 15, 2014[2]
Refrigerators						
Not 'all refrigerator'	Manual	Neither	--	--	8.82AV + 248.4	7.99AV + 225.0
Not 'all refrigerator'	Manual	Compact	--	--	10.70AV + 299.0	9.03AV + 252.3
'All refrigerator'	Manual	Compact	--	--	10.70AV + 299.0	7.84AV + 219.1
'All refrigerator'	Manual	Neither	--	--	--	6.79AV + 193.6
'All refrigerator'	Automatic	Neither	--	--	9.80AV + 276.0	7.07AV + 201.6
'All refrigerator'	Automatic	Built-in	--	--	--	8.02AV + 228.5
'All refrigerator'	Automatic	Compact	--	--	12.70AV + 355.0	9.17AV + 259.3
Refrigerator-freezers						
	Manual	Neither	--	--	8.82AV + 248.4	7.99AV + 225.0
	Partial	Neither	--	--	8.82AV + 248.4	7.99AV + 225.0
	Manual	Compact	--	--	--	9.03AV + 252.3
	Partial	Compact	--	--	7.00AV + 398.0	5.91AV + 335.8
Refrigerator-freezers						
Bottom-Freezer	Automatic	Neither	No	--	4.60AV + 459.0	8.85AV + 317.0
	Automatic	Neither	Yes	No	--	8.85AV + 401.0
	Automatic	Neither	Yes	Yes	--	9.25AV + 475.4
	Automatic	Compact	No	--	13.10AV + 367.0	11.80AV + 339.2
	Automatic	Compact	Yes	--	--	11.80AV + 423.2
	Automatic	Built-in	No	--	--	9.40AV + 336.9
	Automatic	Built-in	Yes	No	--	9.40AV + 420.9
	Automatic	Built-in	Yes	Yes	--	9.83AV + 499.9
Refrigerator-freezers						
Side-by-side	Automatic	Neither	No	--	4.91AV+507.5	8.51AV + 297.8
	Automatic	Neither	Yes	No	--	8.51AV + 381.8
	Automatic	Neither	Yes	Yes	10.10AV + 406.0	8.54AV + 432.8
	Automatic	Compact	No	--	7.60AV + 501.0	6.82AV + 456.9
	Automatic	Compact	Yes	--	--	6.82AV + 540.9
	Automatic	Built-in	No	--	--	10.22AV + 357.4
	Automatic	Built-in	Yes	No	--	10.22AV + 441.4
	Automatic	Built-in	Yes	Yes	--	10.25AV + 502.6
Refrigerator-freezers						
Top-Freezer	Automatic	Neither	No	--	9.80AV + 276.0	8.07AV + 233.7
	Automatic	Neither	Yes	No	--	8.07AV + 317.7
	Automatic	Neither	Yes	Yes	10.20AV + 356.0	8.40AV + 385.4
	Automatic	Compact	No	--	12.70AV + 355.0	11.80AV + 339.2
	Automatic	Compact	Yes	--	--	11.80AV + 423.2
	Automatic	Built-in	No	--	--	9.15AV + 264.9
	Automatic	Built-in	Yes	No	--	9.15AV + 348.9
Freezers						
Upright Freezer	Manual	Neither	No	--	7.55AV + 258.3	5.57AV + 193.7
	Manual	Compact	--	--	9.78AV + 250.8	8.65AV + 225.7
	Automatic	Neither	No	--	12.43AV + 326.1	8.62AV + 228.3
	Automatic	Neither	Yes	--	--	8.62AV + 312.3
	Automatic	Compact	--	--	11.40AV + 391.0	10.17AV + 351.9
	Automatic	Built-in	No	--	--	9.86AV + 260.9
	Automatic	Built-in	Yes	--	--	9.86AV + 344.9
Freezers						
Chest Freezer	Manual	NOT Compact	No	--	--	7.29AV + 107.8
	Partial	NOT Compact	No	--	--	7.29AV + 107.8
	Automatic	NOT Compact	No	--	9.88AV + 143.7	10.24AV + 148.1
	--	Compact	--	--	10.45AV + 152.0	9.25AV + 136.8
Freezers						
Neither Chest Freezer nor Upright Freezer	--	NOT Compact	No	--	--	7.29AV + 107.8

Product class	***Maximum Energy Use (kWh/year)* Equation***
1. Refrigerator-freezers and refrigerators other than all-refrigerators with manual defrost	7.99AV + 225.0 0.282av + 225.0
1A. All-refrigerators—manual defrost	6.79AV + 193.6 0.240av + 193.6
2. Refrigerator-freezers—partial automatic defrost	7.99AV + 225.0 0.282av + 225.0
3. Refrigerator-freezers—automatic defrost with top-mounted freezer without an automatic icemaker	8.07AV + 233.7 0.285av + 233.7
3-BI. Built-in refrigerator-freezer—automatic defrost with top-mounted freezer without an automatic icemaker	9.15AV + 264.9 0.323av + 264.9
3I. Refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker without through-the-door ice service	8.07AV + 317.7 0.285av + 317.7
3I-BI. Built-in refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker without through-the-door ice service	9.15AV + 348.9 0.323av + 348.9
3A. All-refrigerators—automatic defrost	7.07AV + 201.6 0.250av + 201.6
3A-BI. Built-in All-refrigerators—automatic defrost	8.02AV + 228.5 0.283av + 228.5
4. Refrigerator-freezers—automatic defrost with side-mounted freezer without an automatic icemaker	8.51AV + 297.8 0.301av + 297.8
4-BI. Built-In Refrigerator-freezers—automatic defrost with side-mounted freezer without an automatic icemaker	10.22AV + 357.4 0.361av + 357.4
4I. Refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker without through-the-door ice service	8.51AV + 381.8 0.301av + 381.8
4I-BI. Built-In Refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker without through-the-door ice service	10.22AV + 441.4 0.361av + 441.4
5. Refrigerator-freezers—automatic defrost with bottom-mounted freezer without an automatic icemaker	8.85AV + 317.0 0.312av + 317.0
5-BI. Built-In Refrigerator-freezers—automatic defrost with bottom-mounted freezer without an automatic icemaker	9.40AV + 336.9 0.332av + 336.9
5I. Refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker without through-the-door ice service	8.85AV + 401.0 0.312av + 401.0
5I-BI. Built-In Refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker without through-the-door ice service	9.40AV + 420.9 0.332av + 420.9
5A. Refrigerator-freezer—automatic defrost with bottom-mounted freezer with through-the-door ice service	9.25AV + 475.4 0.327av + 475.4
5A-BI. Built-in refrigerator-freezer—automatic defrost with bottom-mounted freezer with through-the-door ice service	9.83AV + 499.9 0.347av + 499.9
6. Refrigerator-freezers—automatic defrost with top-mounted freezer with through-the-door ice service	8.40AV + 385.4 0.297av + 385.4
7. Refrigerator-freezers—automatic defrost with side-mounted freezer with through-the-door ice service	8.54AV + 432.8 0.302av + 432.8
7-BI. Built-In Refrigerator-freezers—automatic defrost with side-mounted freezer with through-the-door ice service	10.25AV + 502.6 0.362av + 502.6
8. Upright freezers with manual defrost	5.57AV + 193.7 0.197av + 193.7
9. Upright freezers with automatic defrost without an automatic icemaker	8.62AV + 228.3 0.305av + 228.3
9I. Upright freezers with automatic defrost with an automatic icemaker	8.62AV + 312.3 0.348av + 260.9
9-BI. Built-In Upright freezers with automatic defrost without an automatic icemaker	9.86AV + 260.9 0.348av + 260.9
9I-BI. Built-in upright freezers with automatic defrost with an automatic icemaker	9.86AV + 344.9 0.348av + 344.9
10. Chest freezers and all other freezers except compact freezers	7.29AV + 107.8 0.257av + 107.8
10A. Chest freezers with automatic defrost	10.24AV + 148.1 0.362av + 148.1
11. Compact refrigerator-freezers and refrigerators other than all-refrigerators with manual defrost	9.03AV + 252.3 0.319av + 252.3
11A.Compact all-refrigerators—manual defrost	7.84AV + 219.1 0.277av + 219.1

Table A-2 cont'd

Product class	***Maximum Energy Use (kWh/year)* Equation****
12. Compact refrigerator-freezers—partial automatic defrost	5.91AV + 335.8 0.209av + 335.8
13. Compact refrigerator-freezers—automatic defrost with top-mounted freezer	11.80AV + 339.2 0.417av + 339.2
13I. Compact refrigerator-freezers—automatic defrost with top-mounted freezer with an automatic icemaker	11.80AV + 423.2 0.417av + 423.2
13A. Compact all-refrigerators—automatic defrost	9.17AV + 259.3 0.324av + 259.3
14. Compact refrigerator-freezers—automatic defrost with side-mounted freezer	6.82AV + 456.9 0.241av + 456.9
14I. Compact refrigerator-freezers—automatic defrost with side-mounted freezer with an automatic icemaker	6.82AV + 540.9 0.241av + 540.9
15. Compact refrigerator-freezers—automatic defrost with bottom-mounted freezer	11.80AV + 339.2 0.417av + 339.2
15I. Compact refrigerator-freezers—automatic defrost with bottom-mounted freezer with an automatic icemaker	11.80AV + 423.2 0.417av + 423.2
16. Compact upright freezers with manual defrost	8.65AV + 225.7 0.306av + 225.7
17. Compact upright freezers with automatic defrost	10.17AV + 351.9 0.359av + 351.9
18. Compact chest freezers	9.25AV + 136.8 0.327av + 136.8

*AV = Adjusted total volume, expressed in ft^3, as determined in 10 C.F.R. sections 430.23(a) (Appendix A to subpart B of part 430) and 430.23(b) (Appendix B to subpart B of part 430)
*av = Adjusted total volume, expressed in Liters.

(B) **Miscellaneous refrigeration products.** The energy standards as determined by the equations shown in Table A-3 shall be rounded off to the nearest kWh per year. If the equation calculation is halfway between the nearest two kWh per year values, the standard shall be rounded up to the higher of these values.

1. Coolers manufactured on or after October 28, 2019 shall have Annual Energy Use (AEU) not more than the applicable values shown in Table A-3.

Table A-3
Standards for Miscellaneous Refrigeration Products

Product Class	***Maximum Annual Energy Use (AEU) (kWh/year)***
Coolers	
Built-in Compact Cooler	7.88AV + 155.8
Built-in Cooler	--
Freestanding Compact Cooler	--
Freestanding Cooler	--
Combination Coolers	
Combination Cooler with all-refrigerator—automatic defrost	4.57AV + 130.4
Built-in combination cooler with all-refrigerator—automatic defrost	5.19AV + 147.8
Combination Cooler with upright freezers with automatic defrost without an automatic icemaker	5.58AV + 147.7
Built-in combination cooler with upright freezer with automatic defrost without an automatic icemaker	6.38AV + 168.8
Combination Cooler with upright freezer with automatic defrost with an automatic icemaker	5.58AV + 231.7
Built-in combination cooler with upright freezer with automatic defrost with an automatic icemaker	6.38AV + 252.8
Compact combination cooler with all-refrigerator—automatic defrost	5.93AV + 193.7

Built-in compact combination cooler with all-refrigerator—automatic defrost	6.52AV + 213.1
AV = Adjusted total volume, expressed in ft^3, as calculated according to 10 C.F.R. Appendix A to subpart B of part 430.	

(2) **Commercial Refrigerators, Commercial Refrigerator-Freezers, and Commercial Freezers.**

(A) ~~The daily energy consumption (in kilowatt hours per day) of each commercial refrigerator-freezer with solid doors and a self-contained condensing unit, manufactured on or after January 1, 2010, and before March 27, 2017, shall be not greater than the greater of ((0.27 × adjusted volume) − 0.71) or 0.70 kWh.~~

~~(B)~~ The daily energy consumption (in kilowatt hours per day) of each commercial refrigerator and commercial freezer manufactured on or after ~~the effective dates shown~~ March 27, 2017 shall be not greater than the applicable values shown in Tables A-4~~,~~ ~~and~~ A-5, and A-6.

Table A-4
Standards for Commercial Refrigerators~~, Refrigerator-~~ and Freezers with a Self-Contained Condensing Unit That are Not Commercial Hybrid Units

~~*Equipment Category and Effective Date*~~	~~*Condensing Unit Configuration*~~	~~*Equipment Family*~~	~~*Rating Temperature (°F)*~~	~~*Operating Temperature (°F)*~~	~~*Equipment Class Designation**~~	~~*Maximum Daily Energy Consumption (kWh)*~~
~~Refrigerators and Freezers~~ ~~Effective January 1, 2010~~ ~~Effective January 1, 2012~~	~~Self Contained (SC)~~	~~Vertical Closed Transparent (VCT)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~VCT, SC, M VCT, SC, L~~	~~0.12 × V + 3.34 0.75 × V + 4.10~~
		~~Horizontal Closed Transparent (HCT)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~HCT, SC, M HCT, SC, L~~	~~0.12 × V + 3.34 0.75 × V + 4.10~~
		~~Vertical Closed Solid (VCS)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~VCS, SC, M VCS, SC, L~~	~~0.10 × V + 2.04 0.40 × V + 1.38~~
		~~Horizontal Closed Solid (HCS)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~HCS, SC, M HCS, SC, L~~	~~0.10 × V + 2.04 0.40 × V + 1.38~~
		~~Service Over Counter (SOC)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~SOC, SC, M SOC, SC, L~~	~~0.12 × V + 3.34 0.6 x TDA + 1.0[1] 0.75 × V + 4.10~~
~~Refrigerators with transparent doors designed for pull-down temperature applications~~ ~~Effective January 1, 2010~~	~~Self Contained (SC)~~	~~Vertical Closed Transparent (VCT)~~	~~38 (P)~~	~~≥ 32~~	~~VCT, SC, P~~	~~0.126 × V + 3.51~~
		~~Horizontal Closed Transparent (HCT)~~	~~38 (P)~~	~~≥ 32~~	~~HCT, SC, P~~	~~0.126 × V + 3.51~~
~~Refrigerators and Freezers~~	~~Self Contained (SC)~~	~~Vertical Open (VOP)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~VOP, SC, M VOP, SC, L~~	~~1.74 × TDA + 4.71 4.37 × TDA +11.82~~

~~without doors~~ ~~Effective January 1, 2012~~		~~Semivertical Open (SVO)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~SVO, SC, M SVO, SC, L~~	~~1.73 × TDA + 4.59 4.34 × TDA +11.51~~
		~~Horizontal Open (HZO)~~	~~38 (M) 0 (L)~~	~~≥ 32 < 32~~	~~HZO, SC, M HZO, SC, L~~	~~0.77 × TDA + 5.55 1.92 × TDA + 7.08~~
~~* The meaning of the letters in this column is indicated in the *Condensing Unit Configuration*, *Equipment Family*, and *Rating Temperature (°F)* columns to the left.~~						

Equipment Category	***Condensing Unit Configuration***	***Equipment Family***	***Rating Temperature (°F)***	***Operating Temperature (°F)***	***Equipment Class Designation****	***Maximum Daily Energy Consumption (kWh)***
Refrigerators and Freezers	Self-Contained (SC)	Vertical Closed Transparent (VCT)	38 (M) 0 (L)	≥ 32 < 32	VCT, SC, M VCT, SC, L	0.1 × V + 0.86 0.29 × V + 2.95
		Vertical Closed Solid (VCS)	38 (M) 0 (L)	≥ 32 < 32	HCT, SC, M HCT, SC, L	0.05 × V + 1.36 0.22 × V + 1.38
		Horizontal Closed Transparent (HCT)	38 (M) 0 (L)	≥ 32 < 32	VCS, SC, M VCS, SC, L	0.06 × V + 0.37 0.08 × V + 1.23
		Horizontal Closed Solid (HCS)	38 (M) 0 (L)	≥ 32 < 32	HCS, SC, M HCS, SC, L	0.05 × V + 0.91 0.06 × V + 1.12
		Service Over Counter (SOC)	38 (M) 0 (L)	≥ 32 < 32	SOC, SC, M SOC, SC, L	0.51 × TDA +1 1.10 × TDA + 2.10
Refrigerators with Transparent Doors	Self-Contained (SC)	Pull Down (PD)	38 (P)	≥ 32	PD, SC, M	0.11 × V + 0.81
Refrigerators and Freezers without doors	Self-Contained (SC)	Vertical Open (VOP)	38 (M) 0 (L)	≥ 32 < 32	VOP, SC, M VOP, SC, L	1.69 × TDA + 4.71 4.25 × TDA +11.82
		Semivertical Open (SVO)	38 (M) 0 (L)	≥ 32 < 32	SVO, SC, M SVO, SC, L	1.70 × TDA + 4.59 4.26 × TDA +11.51
		Horizontal Open (HZO)	38 (M) 0 (L)	≥ 32 < 32	HZO, SC, M HZO, SC, L	0.72 × TDA + 5.55 1.90 × TDA + 7.08
* The meaning of the letters in this column is indicated in the *Condensing Unit Configuration*, *Equipment Family*, and *Rating Temperature (°F)* columns to the left.						

Table A-5
Standards for Commercial Refrigerators and Freezers
with a Remote Condensing Unit That are Not Commercial Hybrid Units

~~*Equipment Category*~~	~~*Condensing Unit Configuration*~~	~~*Equipment Family*~~	~~*Rating Temperature (°F)*~~	~~*Operating Temperature (°F)*~~	~~*Equipment Class Designation**~~	~~*Maximum Daily Energy Consumption (kWh)*~~
~~Refrigerators and Freezers~~ ~~Effective January 1, 2012~~	~~Remote (RC)~~	~~Vertical Open (VOP)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~VOP, RC, M~~ ~~VOP, RC, L~~	~~0.82 × TDA + 4.07~~ ~~2.27 × TDA + 6.85~~
		~~Semivertical Open (SVO)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~SVO, RC, M~~ ~~SVO, RC, L~~	~~0.83 × TDA + 3.18~~ ~~2.27 × TDA + 6.85~~
		~~Horizontal Open (HZO)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~HZO, RC, M~~ ~~HZO, RC, L~~	~~0.35 × TDA + 2.88~~ ~~0.57 × TDA + 6.88~~
		~~Vertical Closed Transparent (VCT)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~VCT, RC, M~~ ~~VCT, RC, L~~	~~0.22 × TDA + 1.95~~ ~~0.56 × TDA + 2.61~~
		~~Horizontal Closed Transparent (HCT)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~HCT, RC, M~~ ~~HCT, RC, L~~	~~0.16 × TDA + 0.13~~ ~~0.34 × TDA + 0.26~~
		~~Vertical Closed Solid (VCS)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~VCS, RC, M~~ ~~VCS, RC, L~~	~~0.11 × V + 0.26~~ ~~0.23 × V + 0.54~~
		~~Horizontal Closed Solid (HCS)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~HCS, RC, M~~ ~~HCS, RC, L~~	~~0.11 × V + 0.26~~ ~~0.23 × V + 0.54~~
		~~Service Over Counter (SOC)~~	~~38 (M)~~ ~~0 (L)~~	~~≥ 32~~ ~~< 32~~	~~SOC, RC, M~~ ~~SOC, RC, L~~	~~0.51 × TDA + 0.11~~ ~~1.08 × TDA + 0.22~~
~~* The meaning of the letters in this column is indicated in the *Condensing Unit Configuration*, *Equipment Family*, and *Rating Temperature (°F)* columns to the left.~~						

Equipment Category	***Condensing Unit Configuration***	***Equipment Family***	***Rating Temperature (°F)***	***Operating Temperature (°F)***	***Equipment Class Designation****	***Maximum Daily Energy Consumption (kWh)***
Refrigerators and Freezers	Remote (RC)	Vertical Open (VOP)	38 (M) 0 (L)	≥ 32 < 32	VOP, RC, M VOP, RC, L	0.64 × TDA + 4.07 2.20 × TDA + 6.85
		Semivertical Open (SVO)	38 (M) 0 (L)	≥ 32 < 32	SVO, RC, M SVO, RC, L	0.66 × TDA + 3.18 2.20 × TDA + 6.85
		Horizontal Open (HZO)	38 (M) 0 (L)	≥ 32 < 32	HZO, RC, M HZO, RC, L	0.35 × TDA + 2.88 0.55 × TDA + 6.88
		Vertical Closed Transparent (VCT)	38 (M) 0 (L)	≥ 32 < 32	VCT, RC, M VCT, RC, L	0.15 × TDA + 1.95 0.49 × TDA + 2.61
		Horizontal Closed Transparent (HCT)	38 (M) 0 (L)	≥ 32 < 32	HCT, RC, M HCT, RC, L	0.16 × TDA + 0.13 0.34 × TDA + 0.26
		Vertical Closed Solid (VCS)	38 (M) 0 (L)	≥ 32 < 32	VCS, RC, M VCS, RC, L	0.10 × V + 0.26 0.21 × V + 0.54
		Horizontal Closed Solid (HCS)	38 (M) 0 (L)	≥ 32 < 32	HCS, RC, M HCS, RC, L	0.10 × V + 0.26 0.21 × V + 0.54

		Service Over Counter (SOC)	38 (M) 0 (L)	≥ 32 < 32	SOC, RC, M SOC, RC, L	0.44 × TDA + 0.11 0.93 × TDA + 0.22
* The meaning of the letters in this column is indicated in the *Condensing Unit Configuration*, *Equipment Family*, and *Rating Temperature (°F)* columns to the left.						

(~~C~~B) The daily energy consumption (in kilowatt hours per day) of commercial ice cream freezers that are not commercial hybrid units and that are manufactured on or after ~~January 1, 2012~~March 27, 2017, shall be not greater than the applicable values shown in Table A-6.

Table A-6
Standards for Commercial Ice Cream Freezers That are Not Commercial Hybrid Units and Are Manufactured on or After January 1, 2012

~~*Equipment Family*~~	~~*Condensing Unit Configuration*~~	~~*Equipment Class Designation*~~	~~*Maximum Daily Energy Consumption (kWh)**~~
~~Vertical Open (VOP)~~	~~Remote (RC) Self-Contained (SC)~~	~~VOP, RC, I VOP, SC, I~~	~~2.89 × TDA + 8.7 5.55 × TDA +15.02~~
~~Semivertical Open (SVO)~~	~~Remote (RC) Self-Contained (SC)~~	~~SVO, RC, I SVO, SC, I~~	~~2.89 × TDA + 8.7 5.52 × TDA +14.63~~
~~Horizontal Open (HZO)~~	~~Remote (RC) Self-Contained (SC)~~	~~HZO, RC, I HZO, SC, I~~	~~0.72 × TDA + 8.74 2.44 × TDA + 9~~
~~Vertical Closed Transparent (VCT)~~	~~Remote (RC) Self-Contained (SC)~~	~~VCT, RC, I VCT, SC, I~~	~~0.66 × TDA + 3.05 0.67 × TDA + 3.29~~
~~Horizontal Closed Transparent (HCT)~~	~~Remote (RC) Self-Contained (SC)~~	~~HCT, RC, I HCT, SC, I~~	~~0.4 × TDA + 0.31 0.56 × TDA + 0.43~~
~~Vertical Closed Solid (VCS)~~	~~Remote (RC) Self-Contained (SC)~~	~~VCS, RC, I VCS, SC, I~~	~~0.27 × V + 0.63 0.38 × V + 0.88~~
~~Horizontal Closed Solid (HCS)~~	~~Remote (RC) Self-Contained (SC)~~	~~HCS, RC, I HCS, SC, I~~	~~0.27 × V + 0.63 0.38 × V + 0.88~~
~~Service Over Counter (SOC)~~	~~Remote (RC) Self-Contained (SC)~~	~~SOC, RC, I SOC, SC, I~~	~~1.26 × TDA + 0.26 1.76 × TDA + 0.36~~
~~* Based on Rating Temperature -15°F and Operating Temperature ≤ -5°F.~~			

Equipment Family	***Condensing Unit Configuration***	***Equipment Class Designation[1]***	***Maximum Daily Energy Consumption (kWh)[2]***
Vertical Open (VOP)	Remote (RC) Self-Contained (SC)	VOP, RC, I VOP, SC, I	2.79 × TDA + 8.7 5.40 × TDA +15.02
Semivertical Open (SVO)	Remote (RC) Self-Contained (SC)	SVO, RC, I SVO, SC, I	2.79 × TDA + 8.7 5.41 × TDA +14.63
Horizontal Open (HZO)	Remote (RC) Self-Contained (SC)	HZO, RC, I HZO, SC, I	0.70 × TDA + 8.74 2.42 × TDA + 9
Vertical Closed Transparent (VCT)	Remote (RC) Self-Contained (SC)	VCT, RC, I VCT, SC, I	0.58 × TDA + 3.05 0.62 × TDA + 3.29
Horizontal Closed Transparent (HCT)	Remote (RC) Self-Contained (SC)	HCT, RC, I HCT, SC, I	0.40 × TDA + 0.31 0.56 × TDA + 0.43
Vertical Closed Solid (VCS)	Remote (RC) Self-Contained (SC)	VCS, RC, I VCS, SC, I	0.25 × V + 0.63 0.34 × V + 0.88

Horizontal Closed Solid (HCS)	Remote (RC) Self-Contained (SC)	HCS, RC, I HCS, SC, I	0.25 × V + 0.63 0.34 × V + 0.88
Service Over Counter (SOC)	Remote (RC) Self-Contained (SC)	SOC, RC, I SOC, SC, I	1.09 × TDA + 0.26 1.53 × TDA + 0.36
[1] The meaning of the letters in this column is indicated in the *Condensing Unit Configuration*, *Equipment Family*, and *Rating Temperature (°F)* columns to the left, and where "I" represents "ice cream freezer." [2] Based on Rating Temperature -15°F and Operating Temperature ≤ -5°F.			

(~~D~~C) **Commercial refrigeration equipment with two or more compartments.** For commercial refrigeration equipment with two or more compartments, (i.e., hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers), the maximum daily energy consumption (MDEC) for each model shall be the sum of the MDEC values for all of its compartments. For each compartment, measure the TDA or volume of that compartment, and determine the appropriate equipment class based on that compartment's equipment family, condensing unit configuration, and designed operating temperature. The MDEC limit for each compartment shall be the calculated value obtained by entering that compartment's TDA or volume into the standard equation in ~~Sections 1605.1(a)(2)(B) and 1605.1(a)(2)(C)~~Table A-4, Table A-5, or Table A-6 of this Article for that compartment's equipment class. Measure the calculated daily energy consumption (CDEC) or total daily energy consumption (TDEC) for the entire case as described in 10 C.F.R. section 431.66(d)(2)(i) through (iii), except that where measurements and calculations reference ARI Standard 1200-2006, AHRI Standard 1200 (I-P)-2010 shall be used.~~:~~

~~(i) For remote condensing commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers, where two or more independent condensing units each separately cool only one compartment, measure the total refrigeration load of each compartment separately according to the ARI Standard 1200-2006 test procedure test procedure incorporated by reference in 10 C.F.R. section 431.63. Calculate compressor energy consumption (CEC) for each compartment using Table 1 in ARI Standard 1200-2006 using the saturated evaporator temperature for that compartment. The CDEC for the entire case shall be the sum of the CEC for each compartment, fan energy consumption (FEC), lighting energy consumption (LEC), anti-condensate energy consumption (AEC), defrost energy consumption (DEC), and condensate evaporator pan energy consumption (PEC), as measured in ARI Standard 1200-2006.~~

~~(ii) For remote condensing commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers, where two or more compartments are cooled collectively by one condensing unit, measure the total refrigeration load of the entire case according to the ARI Standard 1200-2006 test procedure incorporated by reference in 10 C.F.R. section 431.63. Calculate a weighted saturated evaporator temperature for the entire case by:~~

~~a. Multiplying the saturated evaporator temperature of each compartment by the volume of that compartment (as measured in ARI Standard 1200-2006),~~

~~b. Summing the resulting values for all compartments, and~~

~~c. Dividing the resulting total by the total volume of all compartments.~~

~~Calculate the CEC for the entire case using Table 1 in ARI Standard 1200-2006, using the total refrigeration load and the weighted average saturated evaporator temperature. The CDEC for the entire case shall be the sum of the CEC, FEC, LEC, AEC, DEC, and PEC.~~

~~(iii) For self-contained commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and nonhybrid refrigerator-freezers, measure the TDEC for the entire case according to the ARI Standard 1200-2006 test procedure incorporated by reference in 10 C.F.R. section 431.63.~~

(~~E~~D) **Wedge Cases.** For remote-condensing and self-contained wedge cases, measure the CDEC or TDEC according to the AHRI Standard 1200 (I-P) ~~2006~~2010 test procedure incorporated by reference in 10 C.F.R. section 431.63. For wedge cases in equipment classes for which a volume metric is used, the MDEC

shall be the amount derived from the appropriate standards equation in Table A-4, Table A-5, or Table A-6 of this Article. For wedge cases of equipment classes for which a TDA metric is used, the ~~The~~ MDEC for each model shall be the amount derived by incorporating into the standards equation in ~~paragraph (D)~~ Table A-4, Table A-5, or Table A-6 of this Article ~~section~~ for the appropriate equipment class a value for the TDA that is the product of:
~~(i)~~1. The vertical height of the air-curtain (or glass in a transparent door), and
~~(ii)~~2. The largest overall width of the case, when viewed from the front.

EXCEPTION to Section 1605.1(a)(2) of this Article: The standards shown in section 1605.1(a)(2) of this Article do not apply to salad bars, buffet tables, chef bases, or griddle stands.

(3) **Automatic Commercial Ice Makers.**

(A) **Cube Type.** Each cube type automatic commercial ice maker with capacities between 50 and 2500 pounds per 24-hour period and is manufactured on or after January 1, 2010, and before January 28, 2018, shall meet the standard levels set forth in Table A-7.

Table A-7
Standards for Cube Type Automatic Commercial Ice Makers
Manufactured on or After January 1, 2010 and Before January 28, 2018

~~Equipment type~~	~~Type of cooling~~	~~Harvest rate (lbs ice/24 hours)~~	~~Maximum energy use (kWh/100 lbs ice)~~	~~Maximum condenser water use* (gal/100 lbs ice)~~
~~Ice Making Head~~	~~Water~~	~~< 500~~	~~7.80–0.0055H~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 500 and < 1436~~	~~5.58–0.0011H~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 1436~~	~~4.0~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Air~~	~~< 450~~	~~10.26–0.0086H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 450~~	~~6.89–0.0011H~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~< 1000~~	~~8.85–0.0038H~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~≥ 1000~~	~~5.1~~	~~Not applicable.~~
~~Remote Condensing and Remote Compressor~~	~~Air~~	~~< 934~~	~~8.85–0.0038H~~	~~Not applicable.~~
~~Remote Condensing and Remote Compressor~~	~~Air~~	~~≥ 934~~	~~5.3~~	~~Not applicable.~~
~~Self Contained~~	~~Water~~	~~< 200~~	~~11. 40–0.019H~~	~~191–0.0315H.~~
~~Self Contained~~	~~Water~~	~~≥ 200~~	~~7.6~~	~~191–0.0315H.~~
~~Self Contained~~	~~Air~~	~~< 175~~	~~18.0–0.0469H~~	~~Not applicable.~~
~~Self Contained~~	~~Air~~	~~≥ 175~~	~~9.8~~	~~Not applicable.~~
~~H Harvest rate in pounds per 24 hours.~~ ~~*Water use is for the condenser only and does not include potable water used to make ice.~~				

Equipment Type	Type of Cooling	Harvest Rate (lbs ice/24 hours)	Maximum energy use	Maximum condenser water use

			(kWh/100 lbs ice)	***(gallons/100 lbs ice)***
Ice Making Head	Water	< 500	7.80–0.0055H	200–0.022H.
		≥ 500 and < 1436	5.58–0.0011H	200–0.022H.
		≥ 1436	4.0	200–0.022H.
	Air	< 450	10.26–0.0086H	Not applicable.
		≥ 450	6.89–0.0011H	Not applicable.
Remote Condensing (but not remote compressor)	Air	< 1000	8.85–0.0038H	Not applicable.
		≥ 1000	5.1	Not applicable.
Remote Condensing and Remote Compressor		< 934	8.85–0.0038H	Not applicable.
		≥ 934	5.3	Not applicable.
Self-Contained	Water	< 200	11. 40–0.019H	191–0.0315H.
		≥ 200	7.6	191–0.0315H.
	Air	< 175	18.0–0.0469H	Not applicable.
		≥ 175	9.8	Not applicable.
H Harvest rate in pounds per 24 hours. *Water use is for the condenser only and does not include potable water used to make ice.				

(B) **Batch Type.** Each batch type automatic commercial ice maker with capacities between 50 and 4000 pounds per 24-hour period and is manufactured on or after January 28, 2018, shall meet the standard levels set forth in Table A-8.

1. Batch type automatic commercial ice makers include cube type automatic commercial ice makers for purposes of the standards for models manufactured on or after January 28, 2018.

Table A-8
Standards for Batch Type Automatic Commercial Ice Makers
Manufactured on or After January 28, 2018

~~*Equipment type*~~	~~*Type of cooling*~~	~~*Harvest rate (lbs ice/24 hours)*~~	~~*Maximum energy use (kWh/100 lbs ice)*~~	~~*Maximum condenser water use* (gal/100 lbs ice)*~~
~~Ice Making Head~~	~~Water~~	~~≥ 50 and < 300~~	~~6.88-0.0055H~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 300 and < 850~~	~~5.80-0.00191H~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 850 and < 1500~~	~~4.42-0.00028H~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 1500 and < 2500~~	~~4.0~~	~~200–0.022H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 2500 and < 4000~~	~~4.0~~	~~145~~
~~Ice Making Head~~	~~Air~~	~~≥ 50 and < 300~~	~~10-0.01233H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 300 and < 850~~	~~7.05-0.0025H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 850 and < 1500~~	~~5.55-0.00063H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 1500 and < 4000~~	~~4.61~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~≥ 50 and < 988~~	~~7.97-0.00342H~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~≥ 988 and < 4000~~	~~4.59~~	~~Not applicable.~~
~~Remote Condensing and Remote Compressor~~	~~Air~~	~~≥ 50 and < 930~~	~~7.97-0.00342H~~	~~Not applicable.~~

~~Remote Condensing and Remote Compressor~~	~~Air~~	~~≥ 930 and < 4000~~	~~4.79~~	~~Not applicable.~~
~~Self Contained~~	~~Water~~	~~≥ 50 and < 200~~	~~9.5-0.019H~~	~~191–0.0315H.~~
~~Self Contained~~	~~Water~~	~~≥ 200 and < 2500~~	~~5.7~~	~~191–0.0315H.~~
~~Self Contained~~	~~Water~~	~~≥ 2500 and < 4000~~	~~5.7~~	~~112~~
~~Self Contained~~	~~Air~~	~~≥ 50 and < 110~~	~~14.79-0.0469H~~	~~Not applicable.~~
~~Self Contained~~	~~Air~~	~~≥ 110 and < 200~~	~~12.42-0.02533H~~	~~Not applicable.~~
~~Self Contained~~	~~Air~~	~~≥ 200 and < 4000~~	~~7.35~~	~~Not applicable.~~
~~H Harvest rate in pounds per 24 hours.~~ ~~*Water use is for the condenser only and does not include potable water used to make ice.~~				

Equipment Type	***Type of Cooling***	***Harvest Rate (lbs ice/24 hours)***	***Maximum energy use (kWh/100 lbs ice)***	***Maximum condenser water use (gallons/100 lbs ice)***
Ice Making Head	Water	≥ 50 and < 300	6.88-0.0055H	200–0.022H.
		≥ 300 and < 850	5.80-0.00191H	200–0.022H.
		≥ 850 and < 1500	4.42-0.00028H	200–0.022H.
		≥ 1500 and < 2500	4.0	200–0.022H.
		≥ 2500 and < 4000	4.0	145
	Air	≥ 50 and < 300	10-0.01233H	Not applicable.
		≥ 300 and < 850	7.05-0.0025H	Not applicable.
		≥ 850 and < 1500	5.55-0.00063H	Not applicable.
		≥ 1500 and < 4000	4.61	Not applicable.
Remote Condensing (but not remote compressor)	Air	≥ 50 and < 988	7.97-0.00342H	Not applicable.
		≥ 988 and < 4000	4.59	Not applicable.
Remote Condensing and Remote Compressor		≥ 50 and < 930	7.97-0.00342H	Not applicable.
		≥ 930 and < 4000	4.79	Not applicable.
Self-Contained	Water	≥ 50 and < 200	9.5-0.019H	191–0.0315H.
		≥ 200 and < 2500	5.7	191–0.0315H.
		≥ 2500 and < 4000	5.7	112
	Air	≥ 50 and < 110	14.79-0.0469H	Not applicable.
		≥ 110 and < 200	12.42-0.02533H	Not applicable.
		≥ 200 and < 4000	7.35	Not applicable.
H Harvest rate in pounds per 24 hours. *Water use is for the condenser only and does not include potable water used to make ice.				

(C) **Continuous Type.** Each continuous type automatic commercial ice maker with capacities between 50 and 4,000 pounds per 24-hour period manufactured on or after January 28, 2018, shall meet the standard levels set forth in Table A-9.

Table A-9
Standards for Continuous Type Automatic Commercial Ice Makers
Manufactured on or After January 28, 2018

Equipment type	***Type of cooling***	***Harvest rate (lbs ice/24 hours)***	***Maximum energy use (kWh/100 lbs ice)***	***Maximum condenser water use* (gal/100 lbs ice)***
~~Ice Making Head~~	~~Water~~	~~≥ 50 and < 801~~	~~6.48-0.00267H~~	~~180-0.0198H~~

~~Ice Making Head~~	~~Water~~	~~≥ 801 and < 2500~~	~~4.34~~	~~180-0.0198H.~~
~~Ice Making Head~~	~~Water~~	~~≥ 2500 and < 4000~~	~~4.34~~	~~130.5~~
~~Ice Making Head~~	~~Air~~	~~≥ 50 and < 310~~	~~9.19-0.00629H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 310 and < 820~~	~~8.23-0.0032H~~	~~Not applicable.~~
~~Ice Making Head~~	~~Air~~	~~≥ 820 and < 4000~~	~~5.61~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~≥ 50 and < 800~~	~~9.7-0.0058H~~	~~Not applicable.~~
~~Remote Condensing (but not remote compressor)~~	~~Air~~	~~≥ 800 and < 4000~~	~~5.06~~	~~Not applicable.~~
~~Remote Condensing and Remote Compressor~~	~~Air~~	~~≥ 50 and < 800~~	~~9.9-0.0058H~~	~~Not applicable.~~
~~Remote Condensing and Remote Compressor~~	~~Air~~	~~≥ 800 and < 4000~~	~~5.26~~	~~Not applicable.~~
~~Self Contained~~	~~Water~~	~~≥ 50 and < 900~~	~~7.6-0.00302H~~	~~153-0.0252H~~
~~Self Contained~~	~~Water~~	~~≥ 900 and < 2500~~	~~4.88~~	~~153-0.0252H.~~
~~Self Contained~~	~~Water~~	~~≥ 2500 and < 4000~~	~~4.88~~	~~90~~
~~Self Contained~~	~~Air~~	~~≥ 50 and < 200~~	~~14.22-0.03H~~	~~Not applicable.~~
~~Self Contained~~	~~Air~~	~~≥ 200 and < 700~~	~~9.47-0.00624H~~	~~Not applicable.~~
~~Self Contained~~	~~Air~~	~~≥ 700 and < 4000~~	~~5.1~~	~~Not applicable.~~

~~H Harvest rate in pounds per 24 hours.~~
~~*Water use is for the condenser only and does not include potable water used to make ice.~~

Equipment Type	***Type of Cooling***	***Harvest Rate (lbs ice/24 hours)***	***Maximum energy use (kWh/100 lbs ice)***	***Maximum condenser water use (gallons/100 lbs ice)***
Ice Making Head	Water	≥ 50 and < 801	6.48-0.00267H	180-0.0198H
		≥ 801 and < 2500	4.34	180-0.0198H
		≥ 2500 and < 4000	4.34	130.5
	Air	≥ 50 and < 310	9.19-0.00629H	Not applicable
		≥ 310 and < 820	8.23-0.0032H	Not applicable
		≥ 820 and < 4000	5.61	Not applicable
Remote Condensing (but not Remote Compressor)	Air	≥ 50 and < 800	9.7-0.0058H	Not applicable
		≥ 800 and < 4000	5.06	Not applicable
Remote Condensing and Remote Compressor		≥ 50 and < 800	9.9-0.0058H	Not applicable
		≥ 800 and < 4000	5.26	Not applicable
Self-Contained	Water	≥ 50 and < 900	7.6-0.00302H	153-0.0252H
		≥ 900 and < 2500	4.88	153-0.0252H
		≥ 2500 and < 4000	4.88	90
	Air	≥ 50 and < 200	14.22-0.03H	Not applicable
		≥ 200 and < 700	9.47-0.00624H	Not applicable
		≥ 700 and < 4000	5.1	Not applicable

H Harvest rate in pounds per 24 hours.
*Water use is for the condenser only and does not include potable water used to make ice.

(4) **Walk-In Coolers and Walk-In Freezers.** Walk-in coolers and walk-in freezers manufactured on or after January 1, 2009 shall:
(A) have automatic door closers that firmly close all walk-in doors that have been closed to within one inch of full closure, except that this subparagraph shall not apply to doors wider than three feet nine inches or taller than seven feet;
(B) have strip doors, spring hinged doors, or other method of minimizing infiltration when doors are open;
(C) contain wall, ceiling, and door insulation of at least R-25 for coolers and R-32 for freezers, except that this subparagraph shall not apply to:
~~(i)~~1. glazed portions of doors nor to structural members; and
~~(ii)~~2. A walk-in cooler or walk-in freezer component if the component manufacturer has demonstrated to the satisfaction of the Secretary in a manner consistent with applicable requirements that the component reduces energy consumption at least as much as if such insulation requirements of ~~S~~section 1605.1(a)(4)(C) of this Article were to apply.
(D) contain floor insulation of at least R-28 for freezers;
(E) for evaporator fan motors of under one horsepower and less than 460 volts, use:
~~(i)~~1. electronically commutated motors (brushless direct current motors); or
~~(ii)~~2. 3-phase motors;
(F) for condenser fan motors of under one horsepower, use:
~~(i)~~1. electronically commutated motors (brushless direct current motors);
~~(ii)~~2. permanent split capacitor-type motors; or
~~(iii)~~3. 3-phase motors; and
(G) for all interior lights, use light sources with an efficacy of 40 lumens per watt (LPW) or more, including ballast losses (if any), except that light sources with an efficacy of 40 LPW or less, including ballast losses (if any), may be used in conjunction with a timer or device that turns off the lights within 15 minutes of when the walk-in cooler or walk-in freezer is not occupied by people.

(5) **Walk-In Coolers with Transparent Reach-in Doors and Walk-In Freezers with Transparent Reach-In Doors.** In addition to the design standards in ~~S~~section 1605.1(a)(4) of this Article, walk-in coolers equipped with transparent reach-in doors and walk-in freezers equipped with transparent reach-in doors and manufactured on or after January 1, 2009 shall also meet the following design standards:
(A) Transparent reach-in doors for walk-in freezers and windows in walk-in freezer doors shall be of triple-pane glass with either heat-reflective treated glass or gas fill;
(B) Transparent reach-in doors for walk-in coolers and windows in walk-in cooler doors shall be either:
1. double-pane glass with heat-reflective treated glass and gas fill; or
2. triple-pane glass with either heat-reflective treated glass or gas fill;
(C) ~~i~~If the ~~appliance~~walk-in cooler or walk-in freezer has an anti-sweat heater:
1. without anti-sweat heat controls, the ~~appliance~~walk-in cooler or walk-in freezer shall have a total door rail, glass, and frame heater power draw of not more than 7.1 watts per square foot (W/ft^2) of door opening (for freezers) and 3.0 watts per square foot (W/ft^2) of door opening (for coolers);
2. with anti-sweat heat controls, and the total door rail, glass, and frame heater power draw is more than 7.1 watts per square foot (W/ft^2) of door opening (for freezers) and 3.0 watts per square foot (W/ft^2) of door opening (for coolers), the anti-sweat heat controls shall reduce the energy use of the anti-sweat heater in a quantity corresponding to the relative humidity in the air outside the door or to the condensation on the inner glass pane.

(D) **Walk-in cooler and freezer display doors.** All walk-in cooler and walk-in freezer display doors manufactured on or after June 5, 2017, must not exceed the standards shown in Table A-10:

Table A-10
Standards for Walk-in Cooler and Walk-in Freezer Display Doors Manufactured On or After June 5, 2017

Class Descriptor	*Class*	*Maximum Daily Energy Consumption (kWh/day)**
Display Door, Medium Temperature	DD.M	$0.04 \times A_{dd} + 0.41$
Display Door, Low Temperature	DD.L	$0.15 \times A_{dd} + 0.29$

*A_{dd} represents the surface area of the display door.

(E) **Walk-in cooler and freezer non-display doors.** All walk-in cooler and walk-in freezer non-display doors manufactured on or after June 5, 2017, must not exceed the standards shown in Table A-11:

Table A-11
Standards for Walk-in Cooler and Walk-in Freezer Non-Display Doors Manufactured On or After June 5, 2017

Class Descriptor	*Class*	*Maximum Daily Energy Consumption (kWh/day)**
Passage Door, Medium Temperature	PD.M	$0.05 \times A_{nd} + 1.7$
Passage Door, Low Temperature	PD.L	$0.14 \times A_{nd} + 4.8$
Freight Door, Medium Temperature	FD.M	$0.04 \times A_{nd} + 1.9$
Freight Door, Low Temperature	FD.L	$0.12 \times A_{nd} + 5.6$
*A_{nd} represents the surface area of the non-display door.		

(F) **Walk-in cooler and freezer refrigeration systems.** The annual walk-in energy factor of all walk-in cooler and walk-in freezer refrigeration systems manufactured on or after June 5, 2017, must not be less than the values shown in Table A-12:

Table A-12
Standards for Walk-in Cooler and Walk-in Freezer Refrigeration Systems Manufactured On or After June 5, 2017

Class Descriptor	*Class*	*Minimum AWEF (Btu/W-h)*
Dedicated Condensing, Medium Temperature, Indoor System	DC, M, I	5.61
Dedicated Condensing, Medium Temperature, Outdoor System	DC, M, O	7.60

(6) Refrigerated Canned and Bottled Beverage Vending Machines.

(A) **Refrigerated Canned and Bottled Beverage Vending Machines Manufactured Before January 8, 2019.** The daily energy consumption (in kilowatt hours per day) when measured at the 75°F ± 2°F and 45 ± 5% RH condition of each refrigerated bottled or canned beverage vending machine manufactured on or after ~~August 31, 2012~~the effective dates shown shall be not greater than the values shown in Table A-~~10~~13:

Table A-~~10~~13
Standards for Refrigerated Canned and Bottled Beverage Vending Machines Manufactured On or After August 31, 2012 and Before January 8, 2019

Equipment Class	*Maximum Daily Energy Consumption (MDEC) (kWh)*
Class A	0.055 × V + 2.56
Class B	0.073 × V + 3.16
Combination vending machines	RESERVED
V = Representative value of refrigerated volume in ft^3.	

(B) **Refrigerated Canned and Bottled Beverage Vending Machines Manufactured On or After January 8, 2019.** The daily energy consumption (in kilowatt hours per day) of refrigerated canned and bottled beverage vending machines manufactured on or after January 8, 2019 shall not exceed the values shown in Table A-14:

Table A-14
Standards for Refrigerated Canned and Bottled Beverage Vending Machines

Manufactured on or After January 8, 2019

Equipment Class	***Maximum Daily Energy Consumption (MDEC) (kWh)***
Class A	0.052 × V + 2.43
Class B	0.052 × V + 2.20
Combination A	0.086 × V + 2.66
Combination B	0.111 × V + 2.04
V = Representative value of refrigerated volume in ft^3.	

(7) See ~~S~~section 1605.3(a) of this Article for energy efficiency and energy design standards for: ~~refrigerated canned and bottled beverage vending machine manufactured before August 31, 2012,~~
(A) consumer refrigeration coolers manufactured before October 28, 2019;
(B) freezers with volume exceeding 30 ft^3, that do not exceed 39 ft^3; and that are consumer products~~, wine chillers,~~ and
(C) water dispensers.

(b) Room Air Conditioners, Room Air-Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.

(1) **Room Air Conditioners and Room Air-Conditioning Heat Pumps.**

~~(A) The EER of room air conditioners and room air-conditioning heat pumps that are manufactured on or after October 1, 2000 and before June 1, 2014 shall be not less than the applicable values shown in Table B-2. The EER of room air conditioners and room air-conditioning heat pumps that are labeled for use at more than one voltage shall be not less than the applicable values shown in Table B-2 at each of the labeled voltages.~~

~~Table B-2~~
~~Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps~~
~~Manufactured On or After October 1, 2000 and Before June 1, 2014~~

~~Appliance~~	***~~Louvered Sides~~***	***~~Cooling Capacity (Btu/hr)~~***	***~~Minimum EER~~***
~~Room Air Conditioner~~	~~Yes~~	~~< 6,000~~	~~9.7~~
~~Room Air Conditioner~~	~~Yes~~	~~≥ 6,000 – 7,999~~	~~9.7~~
~~Room Air Conditioner~~	~~Yes~~	~~≥ 8,000 – 13,999~~	~~9.8~~
~~Room Air Conditioner~~	~~Yes~~	~~≥ 14,000 – 19,999~~	~~9.7~~
~~Room Air Conditioner~~	~~Yes~~	~~≥ 20,000~~	~~8.5~~
~~Room Air Conditioner~~	~~No~~	~~< 6,000~~	~~9.0~~
~~Room Air Conditioner~~	~~No~~	~~≥ 6,000 – 7,999~~	~~9.0~~
~~Room Air Conditioner~~	~~No~~	~~≥ 8,000 – 19,999~~	~~8.5~~
~~Room Air Conditioner~~	~~No~~	~~≥ 20,000~~	~~8.5~~
~~Room Air Conditioning Heat Pump~~	~~Yes~~	~~< 20,000~~	~~9.0~~
~~Room Air Conditioning Heat Pump~~	~~Yes~~	~~≥ 20,000~~	~~8.5~~
~~Room Air Conditioning Heat Pump~~	~~No~~	~~< 14,000~~	~~8.5~~
~~Room Air Conditioning Heat Pump~~	~~No~~	~~≥ 14,000~~	~~8.0~~
~~Casement-Only Room Air Conditioner~~	~~Either~~	~~Any~~	~~8.7~~
~~Casement-Slider Room Air Conditioner~~	~~Either~~	~~Any~~	~~9.5~~

~~(B)~~ The combined EER of room air conditioners and room air-conditioning heat pumps that are manufactured on or after June 1, 2014 shall be not less than the applicable values shown in Table B-~~3~~2. The EER of room air conditioners and room air-conditioning heat pumps that are labeled for use

at more than one voltage shall be not less than the applicable values shown in Table B-~~3~~2 at each of the labeled voltages.

Table B-~~3~~2
Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps Manufactured On or After June 1, 2014

Appliance	*Louvered Sides*	*Cooling Capacity (Btu/hr)*	*Minimum Combined EER*
Room Air Conditioner	Yes	< 6,000	11.0
Room Air Conditioner	Yes	≥ 6,000 – 7,999	11.0
Room Air Conditioner	Yes	≥ 8,000 – 13,999	10.9
Room Air Conditioner	Yes	≥ 14,000 – 19,999	10.7
Room Air Conditioner	Yes	≥ 20,000 – 27,999	9.4
Room Air Conditioner	Yes	≥ 28,000	9.0
Room Air Conditioner	No	< 6,000	10.0
Room Air Conditioner	No	≥ 6,000 – 7,999	10.0
Room Air Conditioner	No	≥ 8,000 – 10,999	9.6
Room Air Conditioner	No	≥ 11,000 – 13,999	9.5
Room Air Conditioner	No	≥ 14,000 – 19,999	9.3
Room Air Conditioner	No	≥ 20,000	9.4
Room Air Conditioning Heat Pump	Yes	< 20,000	9.8
Room Air Conditioning Heat Pump	Yes	≥ 20,000	9.3
Room Air Conditioning Heat Pump	No	< 14,000	9.3
Room Air Conditioning Heat Pump	No	≥ 14,000	8.7
Casement-Only Room Air Conditioner	Either	Any	9.5
Casement-Slider Room Air Conditioner	Either	Any	10.4

(2) **Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps.**

~~(A)~~ The EER and COP, as applicable, of non-standard size packaged terminal air conditioners and non standard size packaged terminal heat pumps manufactured on or after October 7, 2010, and of standard size packaged terminal air conditioners and standard size packaged terminal heat pumps manufactured on or after January 1, 2017~~October 8, 2012~~ shall be not less than the applicable values shown in Tables B-~~4~~3 and B-~~5~~4.

Table B-~~4~~3
Standards for Non-Standard Size Packaged Terminal Air Conditioners and Non-Standard Size Packaged Terminal Heat Pumps Manufactured On or After October 7, 2010

Appliance	*Cooling Capacity (Btu/hour)*	*Minimum Efficiency*	
		Minimum EER	*Minimum COP*
Packaged Terminal Air Conditioners	< 7,000	9.4	—
	≥ 7,000 < 15,000	10.9 – (0.213 x Cap[1])	—
	≥ 15,000	7.7	—
Packaged Terminal Heat Pumps	< 7,000	9.3	2.7
	≥ 7,000 < 15,000	10.8 – (0.213 x Cap[1])	2.9 - (0.026 x Cap[1])
	≥ 15,000	7.6	2.5

[1] Cap means cooling capacity in thousand British thermal units per hour (Btu/h) at 95°F outdoor dry-bulb temperature.

~~**Table B-5**~~
~~**Standards for Standard Size Packaged Terminal Air Conditioners and Standard Size Packaged Terminal Heat Pumps Manufactured On or After October 8, 2012**~~

~~*Appliance*~~	~~*Cooling Capacity (Btu/hour)*~~	~~*Minimum Efficiency*~~	
		~~*Minimum EER*~~	~~*Minimum COP*~~
~~Packaged Terminal Air Conditioners~~	~~< 7,000~~	~~11.7~~	~~—~~
	~~≥ 7,000 < 15,000~~	~~13.8 – (0.300 x Cap[1])~~	~~—~~
	~~≥ 15,000~~	~~9.3~~	~~—~~
~~Packaged Terminal Heat Pumps~~	~~< 7,000~~	~~11.9~~	~~3.3~~
	~~≥ 7,000 < 15,000~~	~~14.0 – (0.300 x Cap[1])~~	~~3.7 - (0.052 x Cap[1])~~
	~~≥ 15,000~~	~~9.5~~	~~2.9~~
~~[1] Cap means cooling capacity in thousand British thermal units per hour (Btu/h) at 95°F outdoor dry-bulb temperature.~~			

Table B-4
Standards for Standard Size Packaged Terminal Air Conditioners and Standard Size Packaged Terminal Heat Pumps Manufactured On or After January 1, 2017

Appliance	***Cooling Capacity (Btu/hour)***	***Minimum Efficiency***	
		Minimum EER	***Minimum COP***
Packaged Terminal Air Conditioners	< 7,000	11.9	—
	≥ 7,000 < 15,000	14.0 – (0.300 x Cap[1])	—
	≥ 15,000	9.5	—
Packaged Terminal Heat Pumps	< 7,000	11.9	3.3
	≥ 7,000 < 15,000	14.0 – (0.300 x Cap[1])	3.7 - (0.052 x Cap[1])
	≥ 15,000	9.5	2.9
[1] Cap means cooling capacity in thousand British thermal units per hour (Btu/h) at 95°F outdoor dry-bulb temperature.			

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

(1) **Central Air Conditioners.** The EER, IEER, SEER, COP, HSPF, and SCOP, as applicable, of all central air conditioners, including computer room air conditioners, shall be not less than the applicable values shown in Tables C-3, C-4, C-5, C-6, C-7, ~~and~~ C-8, and C-9.

(A) **Evaporatively Cooled Computer Room Air Conditioners.** See ~~S~~section 1605.3(c) of this Article for energy efficiency standards for evaporatively cooled computer room air conditioners.

~~EXCEPTION to Section 1605.1(c)(1): The standards shown in Tables C-2, C-3, C-4, and C-6 do not apply to single-package vertical air conditioners and single-package vertical heat pumps manufactured on or after January 1, 2010.~~

Table C-3
Standards for Single Phase Air-Cooled Air Conditioners with Cooling Capacity Less than 65,000 Btu per Hour and Single Phase Air-Source Heat Pumps with Cooling Capacity Less than 65,000 Btu per Hour, Not Subject to EPAct

Product Class	***Minimum Efficiency Effective January 1, 2015***			
	Minimum SEER	***Minimum HSPF***	***Minimum EER***	***Average Off-Mode Power Consumption $P_{w.pff}$ (watts)***
Split system air conditioners with rated cooling capacity < 45,000 Btu/hour[1]	14.0	—	12.2	30
Split system air conditioners with rated cooling capacity ≥ 45,000 Btu/hour[1]	14.0	—	11.7	30
Split system heat pumps with rated cooling capacity < 45,000 Btu/hour[1]	14.0	8.2	12.2	33
Split system heat pumps with rated cooling capacity ≥ 45,000 Btu/hour[1]			11.7	33
Single package air conditioners[1]	14.0	—	11.0	30
Single package heat pumps	14.0	8.0	—	33
Space constrained air conditioners – split system	12.0	—	—	30
Space constrained heat pumps – split system	12.0	7.4	—	33
Space constrained air conditioners – single package	12.0	—	—	30
Space constrained heat pumps – single package	12.0	7.4	—	33
Small duct, high velocity air conditioner systems	12.0	—	—	30
Small duct, high velocity heat pump systems	12.0	7.2	—	30

[1] See 10 C.F.R. section 430.32(c) for less stringent federal standards applicable to these units that are manufactured on or after January 1, 2015 and installed in states other than Arizona, California, Nevada, or New Mexico.

~~Appliance~~	~~Minimum Efficiency~~					
	~~Effective January 23, 2006~~		~~Effective January 1, 2015~~			
	~~Minimum SEER~~	~~Minimum HSPF~~	~~Minimum SEER~~	~~Minimum HSPF~~	~~Minimum EER~~	~~Average Off-Mode Power Consumption $P_{w.\ pff}$ (watts)~~
~~Split system air conditioners with rated cooling capacity < 45,000 Btu/hour[1]~~	~~13.0~~	~~—~~	~~14.0~~	~~—~~	~~12.2~~	~~30~~
~~Split system air conditioners with rated cooling capacity ≥ 45,000 Btu/hour[1]~~			~~14.0~~	~~—~~	~~11.7~~	~~30~~
~~Split system heat pumps~~	~~13.0~~	~~7.7~~	~~14.0~~	~~8.2~~	~~—~~	~~33~~
~~Single package air conditioners[1]~~	~~13.0~~	~~—~~	~~14.0~~	~~—~~	~~11.0~~	~~30~~
~~Single package heat pumps~~	~~13.0~~	~~7.7~~	~~14.0~~	~~8.0~~	~~—~~	~~33~~
~~Space constrained air conditioners – split system~~	~~12.0~~		~~12.0~~	~~—~~	~~—~~	~~30~~
~~Space constrained heat pumps – split system~~	~~12.0~~	~~7.4~~	~~12.0~~	~~7.4~~	~~—~~	~~33~~
~~Space constrained air conditioners – single package~~	~~12.0~~		~~12.0~~	~~—~~	~~—~~	~~30~~
~~Space constrained heat pumps – single package~~	~~12.0~~	~~7.4~~	~~12.0~~	~~7.4~~	~~—~~	~~33~~
~~Small duct, high velocity air conditioner systems~~	~~13.0~~		~~13.0~~	~~—~~	~~—~~	~~30~~
~~Small duct, high velocity heat pump systems~~	~~13.0~~	~~7.7~~	~~13.0~~	~~7.7~~	~~—~~	~~30~~

~~[1] See 10 C.F.R. section 430.32(c) for less stringent federal standards applicable to these units that are manufactured on or after January 1, 2015 and installed in states other than Arizona, California, Nevada, or New Mexico.~~

EXCEPTION to Section 1605.1(c)(1) Table C-4 of this Article: The standards shown in Table C-4 do not apply to single package vertical air conditioners and single package vertical heat pumps (see Table C-6), packaged terminal air conditioners and packaged terminal heat pumps (see Tables B-3 and B-4), computer room air conditioners(see Table C-7), variable refrigerant flow multi-split air conditioners and heat pumps (see Table C-8), and double-duct air-cooled commercial package air conditioning and heating equipment (see Table C-9).

Table C-4
Standards for ~~Air-Cooled~~ Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled)
Air Conditioners and Air-Source Heat Pumps Subject to EPAct
(Standards Effective January 1, 2010 do not apply ~~T~~to Single Package Vertical Air Conditioners)

Equipment Type	***Cooling Capacity***	***Sub-category***	***Heating Type****	***Efficiency Levels***	***Compliance date: Equipment manufactured starting on***
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System)	< 65,000 Btu/h	AC	All	SEER = 13.0	June 16, 2008
		HP		SEER = 14.0 HSPF = 8.2	January 1, 2017
Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Single-Package)	< 65,000Btu/h	AC	All	SEER = 14.0	January 1, 2017
		HP		SEER = 14.0 HSPF – 8.0	January 1, 2017
Small Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 65,000 Btu/h and < 135,000 Btu/h	AC	E-N	EER = 11.2	January 1, 2010[1]
				IEER = 12.9	January 1, 2018[2]
				IEER = 14.8	January 1, 2023
			A-O	EER = 11.0	January 1, 2010[1]
				IEER = 12.7	January 1, 2018[2]
				IEER = 14.6	January 1, 2023
		HP	E-N	EER = 11.0 COP = 3.3	January 1, 2010[1]
				IEER = 12.2 COP = 3.3	January 1, 2018[2]
				IEER = 14.1 COP = 3.4	January 1, 2023
			A-	EER = 10.8 COP = 3.3	January 1, 2010[1]
				IEER = 12.0 COP = 3.3	January 1, 2018[2]
				IEER = 13.9 COP = 3.4	January 1, 2023

Table C-4 (continued)

Equipment Type	***Cooling Capacity***	***Sub-category***	***Heating Type****	***Efficiency Levels***	***Compliance date: Equipment manufactured starting on***
Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 135,000 Btu/h and < 240,000 Btu/h	AC	E-N	EER = 11.0	January 1, 2010[1]
				IEER = 12.4	January 1, 2018[2]
				IEER = 14.2	January 1, 2023
			A-O	EER = 10.8	January 1, 2010[1]
				IEER = 12.2	January 1, 2018[2]
				IEER = 14.0	January 1, 2023
		HP	E-N	EER = 10.6 COP = 3.2	January 1, 2010[1]
				IEER = 11.6 COP = 3.2	January 1, 2018[2]
				IEER = 13.5 COP = 3.3	January 1, 2023
			A-O	EER = 10.4 COP = 3.2	January 1, 2010[1]
				IEER = 11.4 COP = 3.3	January 1, 2018[2]
				IEER = 13.3 COP = 3.4	January 1, 2023
Very Large Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 240,000 Btu/h and < 760,000 Btu/h	AC	E-N	EER = 10.0	January 1, 2010[1]
				IEER = 11.6	January 1, 2018[2]
				IEER = 13.2	January 1, 2023
			A-O	EER = 9.8	January 1, 2010[1]
				IEER = 11.4	January 1, 2018[2]
				IEER = 13.0	January 1, 2023
		HP	E-N	EER = 9.5 COP = 3.2	January 1, 2010[1]
				IEER = 10.6 COP = 3.2[3]	January 1, 2018[2]
				IEER = 12.5	January 1, 2023
			A-O	EER = 9.3 COP = 3.2	January 1, 2010[1]
				IEER = 10.4 COP = 3.2[3]	January 1, 2018[2]
				IEER = 12.3	January 1, 2023

[1] And manufactured before January 1, 2018.
[2] And manufactured before January 1, 2023.
[3] COP standard remains in effect on and after January 1, 2023.
* E-N = Electric Resistance Heating or No Heating
A-O = All Other Types of Heating

~~*Appliance*~~	~~*Cooling Capacity (Btu/hr)*~~	~~*System Type*~~	~~*Minimum Efficiency*~~		
			~~*Effective June 15, 2008*~~	~~*Effective January 1, 2010*~~	
				~~*Air Conditioners*~~	~~*Heat Pumps*~~
~~Air-cooled unitary air conditioners and heat pumps (cooling mode)~~	~~< 65,000 *~~	~~Split system~~	~~13.0 SEER~~		
	~~< 65,000 *~~	~~Single package~~	~~13.0 SEER~~		
	~~≥ 65,000 and < 135,000~~	~~All~~		~~11.2 EER[3] 11.0 EER[4]~~	~~11.0 EER[3] 10.8 EER[4]~~
	~~≥ 135,000 and < 240,000~~	~~All~~		~~11.0 EER[3] 10.8 EER[4]~~	~~10.6 EER[3] 10.4 EER[4]~~
	~~≥ 240,000 and < 760,000~~	~~All~~		~~10.0 EER[3] 9.8 EER[4]~~	~~9.5 EER[3] 9.3 EER[4]~~
~~Air-cooled unitary air-conditioning heat pumps (heating mode)~~	~~< 65,000 *~~	~~Split system~~	~~7.7 HSPF~~		
	~~< 65,000 *~~	~~Single package~~	~~7.7 HSPF~~		
	~~≥ 65,000 and < 135,000~~	~~All~~		~~3.3 COP~~	
	~~≥ 135,000 and < 240,000~~	~~All~~		~~3.2 COP~~	
	~~≥ 240,000 and < 760,000~~	~~All~~		~~3.2 COP~~	

~~* Three phase models only.~~
~~[3] Applies to equipment that has electric resistance heat or no heating.~~
~~[4] Applies to equipment with all other heating-system types that are integrated into the unitary equipment.~~

Table C-5
Standards for ~~Water-Cooled Air Conditioners, Evaporatively Cooled Air Conditioners, and~~ <u>Commercial Package Air Conditioning and Heating Equipment (Water-Cooled) Air Conditioners, Commercial Package Air Conditioning and Heating Equipment (Evaporatively Cooled) Air Conditioners, and Small Commercial Package</u> Water-Source Heat Pumps

Appliance	Cooling Capacity (Btu per hour)	Minimum Efficiency			
		Effective Prior to October 29, 2012	Effective January 10, 2011	Effective †October 29, 2012 or ††October 29, 2013	Effective *June 1, 2013 or **June 1, 2014
		Minimum EER COP	Minimum EER COP	Minimum EER COP	Minimum EER COP
Water-cooled air conditioners and evaporatively cooled air conditioners	< 17,000	12.1 —			
Water-source heat pumps	< 17,000	11.2 4.2			
Water-source VRF multi-split heat pumps	< 17,000	— 4.2		12.0[1]† 4.2	
Water-cooled air conditioners and evaporatively cooled air conditioners	≥ 17,000 and < 65,000	12.1 —			
Water-source heat pumps, including VRF	≥ 17,000 and < 65,000	12.0 4.2			
Water-cooled air conditioners and evaporatively cooled air conditioners	≥ 65,000 and < 135,000	11.5[1] —			12.1[1]* —
Water-source heat pumps, including VRF	≥ 65,000 and < 135,000	12.0 4.2			11.9* 4.2
Water-cooled air conditioners	≥ 135,000 and < 240,000	11.0 —			12.5[1]** —
Evaporatively cooled air conditioners	≥ 135,000 and < 240,000	11.0 —			12.0[1]** —
Water-source heat pumps	≥ 135,000 and < 240,000	11.0 2.9			12.3** 2.9
Water-source VRF multi-split heat pumps	≥ 135,000 and < 760,000			10.0[1]†† 3.9††	
Water-cooled air conditioners	≥ 240,000 and < 760,000	11.0[1] —	11.0[1] —		12.4[1]** —

~~Evaporatively cooled air conditioners~~	~~≥ 240,000 and < 760,000~~	~~11.0[1]~~	~~11.0[1]~~		~~11.9[1]**~~
~~Water-source heat pumps~~	~~≥ 240,000 and < 760,000~~	~~11.0[1]~~	~~11.0[1]~~		~~12.2**~~

~~[1] Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat. For VRF multi-split heat pumps this applies to units with heat recovery.~~

Equipment Type	***Cooling Capacity***	***Sub-category***	***Heating Type****	***Efficiency Levels***	***Compliance date: Equipment manufactured starting on***
Small Commercial Package Air Conditioning and Heating Equipment (Water-Cooled)	< 65,000 Btu/h	AC	All	EER = 12.1	October 29, 2003
			N-E	EER = 12.1	June 1, 2013
			A-O	EER = 11.9	
Large Commercial Package Air-Conditioning and Heating Equipment (Water-Cooled)	≥ 135,000 Btu/h and < 240,000 Btu/h	AC	N-E	EER = 12.5	June 1, 2014
			A-O	EER = 12.3	
Very Large Commercial Package Air-Conditioning and Heating Equipment (Water-Cooled)	≥ 240,000 Btu/h and < 760,000 Btu/h	AC	N-E	EER = 12.4	June 1, 2014
			A-O	EER = 12.2	
Small Commercial Package Air-Conditioning and Heating Equipment (Evaporatively Cooled)	< 65,000 Btu/h	AC	All	EER = 12.1	October 29, 2003
	≥ 65,000 Btu/h and < 135,000 Btu/h	AC	N-E	EER = 12.1	June 1, 2013
			A-O	EER = 11.9	
Large Commercial Package Air-Conditioning and Heating Equipment (Evaporatively Cooled)	≥ 135,000 Btu/h and < 240,000 Btu/h	AC	N-E	EER = 12.0	June 1, 2014
		AC	A-O	EER = 11.8	
Very Large Commercial Package Air Conditioning and Heating Equipment (Evaporatively Cooled)	≥ 240,000 Btu/h and < 760,000 Btu/h	AC	N-E	EER = 11.9	June 1, 2014
		AC	A-O	EER = 11.7	
Small Commercial Package Air-Conditioning and Heating Equipment (Water-Source: Water-to-Air, Water-Loop)	< 17,000 Btu/h	HP	All	EER = 12.2 COP = 4.3	October 9, 2015
	≥ 17,000 Btu/h and < 135,000 Btu/h			EER = 13.0 COP = 4.3	

* N-E = No Heating or Electric Resistance Heating
A-O = All Other Types of Heating

Table C-6
Standards for Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps Manufactured on or After January 1, 2010

~~*Appliance*~~	~~*Cooling Capacity (BTU/hr)*~~	~~*System Type*~~	~~*Minimum Efficiency*~~	
			~~*Cooling Mode*~~	~~*Heating Mode*~~
~~Single package vertical air conditioners~~	~~< 65,000~~	~~Single-phase~~	~~9.0 EER~~	~~N/A~~
	~~< 65,000~~	~~3-phase~~	~~9.0 EER~~	~~N/A~~
	~~≥ 65,000 and < 135,000~~	~~All~~	~~8.9 EER~~	~~N/A~~
	~~≥ 135,000 and < 240,000~~	~~All~~	~~8.6 EER~~	~~N/A~~
~~Single package vertical heat pumps~~	~~< 65,000~~	~~Single-phase~~	~~9.0 EER~~	~~3.0 COP~~
	~~< 65,000~~	~~3-phase~~	~~9.0 EER~~	~~3.0 COP~~
	~~≥ 65,000 and < 135,000~~	~~All~~	~~8.9 EER~~	~~3.0 COP~~
	~~≥ 135,000 and < 240,000~~	~~All~~	~~8.6 EER~~	~~2.9 COP~~

Equipment type	***Cooling capacity***	***Sub-category***	***Efficiency level***	***Compliance date: products manufactured on and after***
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three-phase	<65,000 Btu/h	AC	EER = 9.0	January 1, 2010
			EER = 11.0	September 23, 2019
		HP	EER = 9.0 COP = 3.0	January 1, 2010
			EER = 11.0 COP = 3.3	September 23, 2019
Single package vertical air conditioners and single package vertical heat pumps	≥65,000 Btu/h and <135,000 Btu/h	AC	EER = 10.0	October 9, 2015
		HP	EER = 10.0 COP = 3.0	
	≥135,000 Btu/h and <240,000 Btu/h	AC	EER = 10.0	October 9, 2016
		HP	EER = 10.0 COP = 3.0	

Table C-7
Standards for Computer Room Air Conditioners

Equipment type	***Net sensible cooling capacity (Btu/hr)***	***Minimum SCOP efficiency***		***Compliance date:***
		Downflow unit	***Upflow unit***	
Air-Cooled	<65,000	2.20	2.09	October 29, 2012
	≥65,000 and <240,000	2.10	1.99	October 29, 2013
	≥240,000 and <760,000	1.90	1.79	October 29, 2013
Water-Cooled	<65,000	2.60	2.49	October 29, 2012
	≥65,000 and <240,000	2.50	2.39	October 29, 2013
	≥240,000 and <760,000	2.40	2.29	October 29, 2013
Water-Cooled with a Fluid Economizer	<65,000	2.55	2.44	October 29, 2012
	≥65,000 and <240,000	2.45	2.34	October 29, 2013
	≥240,000 and <760,000	2.35	2.24	October 29, 2013
Glycol-Cooled	<65,000	2.50	2.39	October 29, 2012
	≥65,000 and <240,000	2.15	2.04	October 29, 2013
	≥240,000 and <760,000	2.10	1.99	October 29, 2013

Glycol-Cooled with a Fluid Economizer	<65,000	2.45	2.34	October 29, 2012
	≥65,000 and <240,000	2.10	1.99	October 29, 2013
	≥240,000 and <760,000	2.05	1.94	October 29, 2013

Table C-8
Standards for Variable Refrigerant Flow Multi-Split Air Conditioners and Heat Pumps

~~*Equipment type*~~	~~*Cooling Capacity*~~	~~*Heating type*~~[1]	~~*Efficiency level*~~	~~*Compliance date: Products manufactured on and after…*~~
~~VRF Multi-Split Air Conditioners (Air-Cooled)~~	~~<65,000 Btu/h~~ ~~≥65,000 Btu/h and <135,000 Btu/h~~	~~All~~ ~~No Heating or Electrical Resistance Heating~~	~~13.0 SEER~~ ~~11.2 EER~~	~~June 16, 2008~~ ~~January 1, 2010~~
		~~All Other Types of Heating~~	~~11.0 EER~~	~~January 1, 2010~~
	~~≥135,000 Btu/h and <240,000 Btu/h~~	~~No Heating or Electrical Resistance Heating~~	~~11.0 EER~~	~~January 1, 2010~~
		~~All Other Types of Heating~~	~~10.8 EER~~	~~January 1, 2010~~
	~~≥240,000 Btu/h and <760,000 Btu/h~~	~~No Heating or Electrical Resistance Heating~~	~~10.0 EER~~	~~January 1, 2010~~
		~~All Other Types of Heating~~	~~9.8 EER~~	~~January 1, 2010~~
~~VRF Multi-Split Heat Pumps (Air-Cooled)~~	~~<65,000 Btu/h~~	~~All~~	~~13.0 SEER~~ ~~7.7 HSPF~~	~~June 16, 2008~~
	~~≥65,000 Btu/h and <135,000 Btu/h~~	~~No Heating or Electrical Resistance Heating~~	~~11.0 EER~~ ~~3.3 COP~~	~~January 1, 2010~~
		~~All Other Types of Heating~~	~~10.8 EER~~ ~~3.3 COP~~	~~January 1, 2010~~
	~~≥135,000 Btu/h and <240,000 Btu/h~~	~~No Heating or Electrical Resistance Heating~~	~~10.6 EER~~ ~~3.2 COP~~	~~January 1, 2010~~
		~~All Other Types of Heating~~	~~10.4 EER~~ ~~3.2 COP~~	~~January 1, 2010~~
	~~≥240,000 Btu/h and <760,000 Btu/h~~	~~No Heating or Electrical Resistance Heating~~	~~9.5 EER~~ ~~3.2 COP~~	~~January 1, 2010~~
		~~All Other Types of Heating~~	~~9.3 EER~~ ~~3.2 COP~~	~~January 1, 2010~~
~~VRF Multi-Split Heat Pumps (Water-Source)~~	~~<17,000 Btu/h~~	~~Without heat recovery~~	~~12.0 EER~~ ~~4.2 COP~~	~~October 29, 2012~~ ~~October 29, 2003~~
		~~With heat recovery~~	~~11.8 EER~~ ~~4.2 COP~~	~~October 29, 2012~~ ~~October 29, 2003~~
	~~≥17,000 Btu/h and <65,000 Btu/h~~	~~All~~	~~12.0 EER~~ ~~4.2 COP~~	~~October 29, 2003~~
	~~≥65,000 Btu/h and <135,000 Btu/h~~	~~All~~	~~12.0 EER~~ ~~4.2 COP~~	~~October 29, 2003~~
	~~≥135,000 Btu/h and <760,000 Btu/h~~	~~Without heat recovery~~	~~10.0 EER~~ ~~3.9 COP~~	~~October 29, 2013~~

		~~With heat recovery~~	~~9.8 EER 3.9 COP~~	~~October 29, 2013~~

~~[1]VRF Multi-Split Heat Pumps (Air-Cooled) with heat recovery fall under the category of "All Other Types of Heating" unless they also have electric resistance heating, in which case it falls under the category for "No Heating or Electric Resistance Heating."~~

Equipment Type	***Cooling Capacity (Btu/h)***	***Heating Type[1]****	***Efficiency Level***	***Compliance Date: Products Manufactured on and After***
VRF Multi-Split Air Conditioners (Air-Cooled)	< 65,000	All	13.0 SEER	June 16, 2008
	≥ 65,000 and < 135,000	N-E	11.2 EER	January 1, 2010
		A-O	11.0 EER	January 1, 2010
	≥ 135,000 and < 240,000	N-E	11.0 EER	January 1, 2010
		A-O	10.8 EER	January 1, 2010
	≥ 240,000 and < 760,000	N-E	10.0 EER	January 1, 2010
		A-O	9.8 EER	January 1, 2010
VRF Multi-Split Heat Pumps (Air-Cooled)	< 65,000	All	13.0 SEER 7.7 HSPF	June 16, 2008
	≥65,000 Btu/h and <135,000 Btu/h	N-E	11.0 EER 3.3 COP	January 1, 2010.
		A-O	10.8 EER 3.3 COP	January 1, 2010
	≥ 135,000 and < 240,000	N-E	10.6 EER 3.2 COP	January 1, 2010
		A-O	10.4 EER 3.2 COP	January 1, 2010
	≥ 240,000 and < 760,000	N-E	9.5 EER 3.2 COP	January 1, 2010
		A-O	9.3 EER 3.2 COP	January 1, 2010
VRF Multi-Split Heat Pumps (Water-Source)	<17,000 Btu/h	Without heat recovery	12.0 EER 4.2 COP	October 29, 2012. October 29, 2003.
		With heat recovery	11.8 EER 4.2 COP	October 29, 2012. October 29, 2003.
	≥17,000 Btu/h and <65,000 Btu/h	All	12.0 EER 4.2 COP	October 29, 2003.
	≥65,000 Btu/h and <135,000 Btu/h	All	12.0 EER 4.2 COP	October 29, 2003.
	≥135,000 Btu/h and <760,000 Btu/h	Without heat recovery	10.0 EER 3.9 COP	October 29, 2013.
		With heat recovery	9.8 EER 3.9 COP	October 29, 2013

[1]VRF Multi-Split Heat Pumps (Air-Cooled) with heat recovery fall under the category of "All Other Types of Heating" unless they also have electric resistance heating, in which case it falls under the category for "No Heating or Electric Resistance Heating."

* N-E = No Heating or Electric Resistance Heating
A-O = All Other Types of Heating

Table C-9
Standards for Double-Duct Commercial Packaged Air Conditioning and Heating Equipment Manufactured on or After January 1, 2010

Equipment type	*Cooling capacity*	*Sub-category*	*Heating type**	*Efficiency level*[1]
Small Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 65,000 Btu/h and < 135,000 Btu/h	AC	E-N	EER = 11.2
			A-O	EER = 11.0
		HP	E-N	EER = 11.0 COP = 3.3
			A-O	EER = 10.8 COP = 3.3
Large Commercial Double-Duct Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 135,000 Btu/h and < 240,000 Btu/h	AC	E-N	EER = 11.0
			A-O	EER = 10.8
		HP	E-N	EER = 10.6 COP = 3.2
			A-O	EER = 10.4 COP = 3.2
Very Large Double-Duct Commercial Packaged Air Conditioning and Heating Equipment (Air-Cooled)	≥ 240,000 Btu/h and < 300,000 Btu/h	AC	E-N	EER = 10.0
			A-O	EER = 9.8
		HP	E-N	EER = 9.5 COP = 3.2
			A-O	EER = 9.3 COP = 3.2

* E-N = Electric Resistance Heating or No Heating
A-O = All Other Types of Heating
[1]For units tested using the relevant AHRI Standards, all COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled equipment.

(2) **Gas-fired Air Conditioners and Heat Pumps.** There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.

(3) **Other Central Air Conditioners.** See Ssections ~~1605.2(c) and~~ 1605.3(c) of this Article for energy efficiency standards for other central air conditioners.

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

(5) **Air Filters.** There are no energy efficiency standards or energy design standards for air filters.

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

(1) **Ceiling fans.**

(A) Ceiling fans manufactured on or after January 1, 2007~~,~~ shall have the following features:

~~(A)~~1. Fan speed controls separate from any lighting controls;
~~(B)~~2. Adjustable speed controls (either more than 1 speed or variable speed);
~~(C)~~3. The capability of reversible fan action, except for:
~~1~~a. Fans sold for industrial applications;
~~2~~b. Fans sold for outdoor applications; and
~~3~~c. Cases in which safety standards would be violated by the use of the reversible mode.

(B) Ceiling fans manufactured on or after January 21, 2020 shall meet the requirements shown in Table D-4.

Table D-4
Standards for Ceiling Fans Manufactured On or After January 21, 2020

Ceiling Fan Type	*Efficiency (CFM/Watts)*[1]
Very small-diameter (VSD)	D ≤ 12 inches: 21 D > 12 inches: 3.16 D −17.04
Standard	0.65 D + 38.03
Hugger	0.29 D + 34.46
High-speed small-diameter (HSSD)	4.16 D + 0.02
Large-diameter	0.91 D−30.00
[1]D is the ceiling fan's blade span, in inches.	

EXCEPTIONS to Section 1605.1(d)(1) of this Article: The provisions in section 1605.1(d)(1) of this Article apply to ceiling fans except:

(1) Ceiling fans where the plane of rotation of a ceiling fan's blades is not less than or equal to 45 degrees from horizontal, or cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal;
(2) Centrifugal ceiling fans, as defined in section 1602(d) of this Article;
(3) Belt-driven ceiling fans, as defined in section 1602(d) of this Article;
(4) Oscillating ceiling fans, as defined in section 1602(d) of this Article; and
(5) Highly decorative ceiling fans, as defined in section 1602(d) of this Article.

(2) **Ceiling fan light kits.**

~~(A) Ceiling fan light kits with medium screw base sockets manufactured on or after January 1, 2007, shall be packaged with screw-based lamps to fill all screw base sockets.~~

~~1. The screw-based lamps required under Section 1605.1(d)(2)(A) shall:~~

~~a. Meet the ENERGY STAR Program requirements for Compact Fluorescent Lamps, version 3; or~~

~~b. Use light sources other than compact fluorescent lamps that have lumens per watt performance at least equivalent to comparable configured compact fluorescent lamps meeting the energy conservation standards described in Section 1605.1(d)(2)(A)1.a.~~

~~(B) Ceiling fan light kits with pin-based sockets for fluorescent lamps manufactured on or after January 1, 2007 shall:~~

~~1. Meet the ENERGY STAR Program Requirements for Residential Light Fixtures version 4.0 issued by the Environmental Protection Agency; and~~

~~2. Be packaged with lamps described in section 1605.1(d)(2)(B)1. of this Article with the ceiling fan light kits to fill all sockets.~~

~~(C) Ceiling fan light kits with socket types other than those covered in Sections 1605.1(d)(2)(A) and 1605.1(d)(2)(B), including candelabra screw base sockets, manufactured on or after January 1, 2009 shall:~~

~~1. Not be capable of operating with lamps that total more than 190 watts; and~~

~~2. Be packaged to include the lamps described in Section 1605.1(d)(2)(C)1. with the ceiling fan light kits.~~

(A) **Ceiling Fan Light Kits with Medium Screw Base Sockets.** Ceiling fan light kits manufactured on or after January 1, 2007, and prior to January 7, 2019, with medium screw base sockets must be packaged with medium screw base lamps to fill all sockets. These medium screw base lamps must:

1. Be compact fluorescent lamps that meet or exceed the requirements shown in Table D-5 or be as described in section 1605.1(d)(2)(A)2 of this Article:

Table D-5
Requirements for CFLs Used in Ceiling Fan Light Kits with Medium Screw Base Sockets

Factor	***Requirements***
Rated Wattage (Watts) & Configuration[1]	Minimum Initial Lamp Efficacy (lumens per watt)[2]
Bare Lamp:	
Lamp Power < 15	45.0
Lamp Power ≥ 15	60.0
Covered Lamp (no reflector):	
Lamp Power < 15	40.0
15 ≤ Lamp Power < 19	48.0
19 ≤ Lamp Power < 25	50.0
Lamp Power ≥ 25	55.0
With Reflector:	
Lamp Power < 20	33.0
Lamp Power ≥ 20	40.0
Lumen Maintenance at 1,000 hours	≥ 90.0%
Lumen Maintenance at 40 Percent of Lifetime	≥ 80.0%
Rapid Cycle Stress Test	Each lamp must be cycled once for every 2 hours of lifetime. At least 5 lamps must meet or exceed the minimum number of cycles.
Lifetime	≥ 6,000 hours for the sample of lamps.
[1]Use rated wattage to determine the appropriate minimum efficacy requirements in this table. [2]Calculate efficacy using measured wattage, rather than rated wattage, and measured lumens to determine product compliance. Wattage and lumen values indicated on products or packaging may not be used in calculation.	

2. Be light sources other than compact fluorescent lamps that have lumens per watt performance at least equivalent to comparably configured compact fluorescent lamps meeting the energy conservation standards in section 1605.1(d)(2)(A)1. of this Article.

(B) **Ceiling Fan Light Kits with Pin-Based Sockets for Fluorescent Lamps.** Ceiling fan light kits manufactured on or after January 1, 2007, and prior to January 7, 2019, with pin-based sockets for fluorescent lamps must use an electronic ballast and be packaged with lamps to fill all sockets. These lamp ballast platforms must meet the requirements shown in Table D-6:

Table D-6
System Efficacy Per Lamp Ballast Platform in Lumens Per Watt (lm/W)

Lamp Description	*Minimum Lumens Per Watt (lm/W)*
All lamps below 30 total listed lamp watts	50 lm/w
All lamps that are ≤ 24 inches and ≥ 30 total listed lamp watts	60 lm/w
All lamps that are > 24 inches and ≥ 30 total listed lamp watts.	70 lm/w

(C) **Ceiling fan light kits manufactured on or after January 1, 2009, and prior to January 7, 2019.** Ceiling fan light kits manufactured on or after January 1, 2009, and prior to January 7, 2019, with socket types other than those covered in sections 1605.1(d)(2)(A) and 1605.1(d)(2)(B) of this Article, including candelabra screw base sockets, must be packaged with lamps to fill all sockets and must not be capable of operating with lamps that total more than 190 watts.

(D) **Ceiling fan light kits manufactured on or after January 7, 2019.** Ceiling fan light kits manufactured on or after January 7, 2019 must be packaged with lamps to fill all sockets, and each basic model of lamp packaged with the basic model of the ceiling fan light kit and each basic model of integrated SSL in the ceiling fan light kit basic model shall meet the requirements shown in Table D-7:

Table D-7
Standards for Ceiling Fan Light Kits Manufactured On or After January 7, 2019

Lumens[1]	Minimum required efficacy (lm/W)
< 120	50
≥ 120	$(74.0 - 29.42 \times 0.9983^{lumens})$
[1]Use the lumen output for each basic model of lamp packaged with the basic model of ceiling fan light kit (CFLK) or each basic model of integrated SSL in the CFLK basic model to determine the applicable standard.	

1. **Ceiling Fan Light Kits with Medium Screw Base Sockets.** Ceiling fan light kits with medium screw base sockets manufactured on or after January 7, 2019 and packaged with compact fluorescent lamps must include lamps that also meet the requirements shown in Table D-8:

Table D-8
Standards for Ceiling Fan Light Kits with Medium Screw Base Sockets Manufactured On or After January 7, 2019

Criteria	*Requirement*
Lumen Maintenance at 1,000 Hours	≥ 90%
Lumen Maintenance at 40 Percent of Lifetime	≥ 80%
Rapid Cycle Stress Test	Each lamp must be cycled once for every 2 hours of lifetime of compact fluorescent lamp. At least 5 lamps must meet or exceed the minimum number of cycles.
Lifetime	≥ 6,000 hours for the sample of lamps

2. **Ceiling Fan Light Kits with Pin Based Sockets for Fluorescent Lamps.** Ceiling fan light kits with pin based sockets for fluorescent lamps, manufactured on or after January 7, 2019, must also use an electronic ballast.

(3) **Dehumidifiers.**

(A) **Dehumidifiers Manufactured On or After October 1, 2012 and Before June 13, 2019.** The energy factor for dehumidifiers manufactured on or after October 1, 2012 and before June 13, 2019 ~~the effective dates shown~~ shall be not less than the applicable values ~~found~~shown in Table D-~~2~~9.

Table D-~~2~~9
Standards for Dehumidifiers Manufactured On or After October 1, 2012 And Before June 13, 2019

Product capacity (pint/day)	*Minimum energy factor (liters/kWh)*	
	~~*Effective October 1, 2007*~~	*Effective October 1, 2012*
25.00 or less	~~1.00~~	1.35
25.01 – 35.00	~~1.20~~	1.35
35.01 – 45.00	~~1.30~~	1.50
45.01 – 54.00	~~1.30~~	1.60
54.01 – 74.99	~~1.50~~	1.70
75.00 or more	~~2.25~~	2.50

(B) **Dehumidifiers Manufactured On or After June 13, 2019.** The integrated energy factor for dehumidifiers manufactured on or after June 13, 2019 shall be not less than the applicable values shown in Table D-10.

Table D-10
Standards for Dehumidifiers Manufactured On or After June 13, 2019

Portable dehumidifier product capacity (pints/day)	*Minimum Integrated Energy Factor (liters/kWh)*
25.00 or less	1.30
25.01 – 50.00	1.60
50.01 or more	2.80
Whole-home dehumidifier product case volume (ft^3)	
8.0 or less	1.77
More than 8.0	2.41

(4) **Residential furnace fans.** Residential furnace fans incorporated in the products listed in Table D-10 of this Article and manufactured on and after July 3, 2019, shall have a fan energy rating (FER) value that meets or is less than the values shown in Table D-10.

(A) **Exceptions.** Furnace fans incorporated into hydronic air handlers, SDHV modular blowers, SDHV electric furnaces, and central air conditioner/central heat pump indoor units are not subject to the standards listed in Table D-11.

Table D-11
Energy Conservation Standards for Federally Covered Residential Furnace Fans

Product class	***FER[1] (Watts/cfm)***
Non-Weatherized, Non-Condensing Gas Furnace Fan (NWG-NC)	FER = 0.044 × Q_{Max} + 182
Non-Weatherized, Condensing Gas Furnace Fan (NWG-C)	FER = 0.044 × Q_{Max} + 195
Weatherized Non-Condensing Gas Furnace Fan (WG-NC)	FER = 0.044 × Q_{Max} + 199
Non-Weatherized, Non-Condensing Oil Furnace Fan (NWO-NC)	FER = 0.071 × Q_{Max} + 382
Non-Weatherized Electric Furnace/Modular Blower Fan (NWEF/NWMB)	FER = 0.044 × Q_{Max} + 165
Mobile Home Non-Weatherized, Non-Condensing Gas Furnace Fan (MH-NWG-NC)	FER = 0.071 × Q_{Max} + 222
Mobile Home Non-Weatherized, Condensing Gas Furnace Fan (MH-NWG-C)	FER = 0.071 × Q_{Max} + 240
Mobile Home Electric Furnace/Modular Blower Fan (MH-EF/MB)	FER = 0.044 × Q_{Max} + 101
Mobile Home Non-Weatherized Oil Furnace Fan (MH-NWO)	Reserved
Mobile Home Weatherized Gas Furnace Fan (MH-WG)**	Reserved
[1] Q_{Max} is the airflow, in cfm, at the maximum airflow-control setting measured using the final DOE test procedure at 10 CFR part 430, subpart B, appendix AA.	

(~~4~~5) There are no energy efficiency standards or energy design standards for ~~spot~~portable air conditioners, evaporative coolers, whole house fans, or residential exhaust fans. There are no efficiency standards for ceiling fans ~~and ceiling fan light kits~~.

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

(1) **Gas Wall Furnaces, Gas Floor Furnaces, and Gas Room Heaters.** The AFUE of gas wall furnaces, gas floor furnaces, and gas room heaters manufactured on or after the effective dates shown shall be not less than the applicable values shown in Table E-2.

Table E-2
Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters

Appliance	***Design Type***	***Capacity (Btu per hour)***	***Minimum AFUE (%)***	
			~~***Effective Before April 16, 2013***~~	***Effective On or After April 16, 2013***
Wall furnace	Fan	≤ 42,000	~~73~~	75
Wall furnace	Fan	> 42,000	~~74~~	76
Wall furnace	Gravity	≤ ~~10,000~~27,000	~~59~~	65
~~Wall furnace~~	~~Gravity~~	~~> 10,000 and ≤ 12,000~~	~~60~~	
~~Wall furnace~~	~~Gravity~~	~~> 12,000 and ≤ 15,000~~	~~61~~	
~~Wall furnace~~	~~Gravity~~	~~> 15,000 and ≤ 19,000~~	~~62~~	
~~Wall furnace~~	~~Gravity~~	~~> 19,000 and ≤ 27,000~~	~~63~~	
Wall furnace	Gravity	> 27,000 and ≤ 46,000	~~64~~	66
Wall furnace	Gravity	> 46,000	~~65~~	67
Floor furnace	All	≤ 37,000	~~56~~	57
Floor furnace	All	> 37,000	~~57~~	58
Room heater	All	≤ ~~18,000~~20,000	~~57~~	61
~~Room heater~~	~~All~~	~~> 18,000 and ≤ 20,000~~	~~58~~	
Room heater	All	> 20,000 and ≤ 27,000	~~63~~	66
Room heater	All	> 27,000 and ≤ 46,000	~~64~~	67
Room heater	All	> 46,000	~~65~~	68

(2) **Central Gas Furnaces, Central Gas Boilers, Central Oil Furnaces, Central Oil Boilers, and Electric Residential Boilers.** The AFUE, thermal efficiency, and combustion efficiency, as applicable, of central gas furnaces, central gas boilers, central oil furnaces, and central oil boilers manufactured on or

after the effective dates shown shall ~~be not less than the applicable values~~ meet all applicable requirements shown in Tables E-3, E-4, E-5, and E-6. Electric hot water residential boilers manufactured on or after September 1, 2012 shall meet the design standard shown in Table E-3.

Table E-3
Standards for Gas- and Oil-Fired Central Boilers < 300,000 Btu/hour Input and Electric Residential Boilers

Appliance	*Minimum AFUE (%)*		*Maximum Power Consumption*		
	~~*Effective January 1, 1992*~~	*Effective September 1, 2012*	*Effective January 15, 2021*		
			AFUE	*Standby*	*Off Mode*
Gas steam boilers with single phase electrical supply	~~75~~	80 [1]	82 [1]	8	8
Gas hot water boilers with single phase electrical supply	~~80~~	82 [1,2]	84 [1,2]	9	9
Oil steam boilers with single phase electrical supply	~~—~~	82	85	11	11
Oil hot water boilers with single phase electrical supply	~~—~~	84 [2]	86 [2]	11	11
Electric steam residential boilers	~~—~~	NONE	NONE	8	8
Electric hot water residential boilers	~~—~~	NONE [2]	NONE [2]	8	8
~~All other boilers with single phase electrical supply~~	~~80~~	~~—~~			
~~Gas packaged boilers~~	~~—~~	~~—~~			
~~Oil packaged boilers~~	~~—~~	~~—~~			

[1] No constant burning pilot light design standard effective September 1, 2012.
[2] Automatic means for adjusting temperature design standard effective September 1, 2012. (Boilers equipped with tankless domestic water heating coils do not need to comply with this requirement.)

(A) **Automatic Means for Adjusting Water Temperature.** The automatic means for adjusting the temperature design, shown as footnote 2 in Table E-3 immediately above, means:

1. **In General.** The manufacturer shall equip each gas, oil, and electric hot water boiler (other than a boiler equipped with a tankless domestic water heating coil) with automatic means for adjusting the temperature of the water supplied by the boiler to ensure that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of water supplied.

2. **Single Input Rate.** For a boiler that fires at one input rate, the requirements of this subparagraph may be satisfied by providing an automatic means that allows the burner or heating element to fire only when the means has determined that the inferred heat load cannot be met by the residual heat of the water in the system.

3. **No Inferred Heat Load.** When there is no inferred heat load with respect to a hot water boiler, the automatic means described in ~~clauses~~ subsections 1605.1(e)(2)(A)1. and 1605.1(e)(2)(A)2. of this Article shall limit the temperature of the water in the boiler to not more than 140˚F.

4. **Operation.** A boiler described in ~~clause~~subsections 1605.1(e)(2)(A)1. or 1605.1(e)(2)(A)2. of this Article shall be operable only when the automatic means described in ~~clauses~~ subsections 1605.1(e)(2)(A)1., 1605.1(e)(2)(A)2., and 1605.1(e)(2)(A)3. of this Article is installed.

(B) **EXCEPTION to ~~S~~section 1605.1(e)(2) of this Article**: A boiler that is manufactured to operate without any need for electricity or any electric connection, electric gauges, electric pumps, electric wires, or electric devices shall not be required to meet the efficiency standards or design standard that take effect for models manufactured on or after September 1, 2012. Boilers described in this

EXCEPTION are required to meet the efficiency standards in effect prior to September 1, 2012, as applicable.

Table E-4
Standards for Gas- and Oil-Fired Commercial Packaged Boilers ≥ 300,000 Btu/hour Input

Appliance	*Type*	*Rated Input (Btu/hr)*	*Minimum Efficiency (%)*			
			Combustion Efficiency %		*Thermal Efficiency%*	
			~~*January 1 1994 through March 1, 2012*~~	*March 2, 2012*	*March 2, 2012 through March 1, 2022*	*March 2, 2022*
Hot Water Boilers	Gas-fired	≥ 300,000 and ≤ 2,500,000	~~80~~	—	80	80
		> 2,500,000		82	—	—
	Oil-fired	≥ 300,000 and ≤ 2,500,000	~~83~~	—	82	82
		> 2,500,000		84	—	—
Steam Boilers	Gas-fired, except natural draft	≥ 300,000 and ≤ 2,500,000	~~80~~	—	79	79
		> 2,500,000		—		
	Gas-fired, natural draft	≥ 300,000 and ≤ 2,500,000	~~80~~	—	77	79
		> 2,500,000		—		
	Oil-fired	≥ 300,000 and ≤ 2,500,000	~~83~~	—	81	81
		> 2,500,000		—		

Table E-5
Standards for Commercial Gas- and Oil-Fired Central Furnaces

Appliance	*Rated Input (Btu/hr)*	*Minimum Thermal Efficiency*	
		January 1, 1994	*January 1, 2023*
Gas central furnaces	≥ 225,000	80	81
Oil central furnaces	≥ 225,000	81	82

Table E-6
Standards for Gas- and Oil-Fired Central Furnaces Less Than 225,000 Btu/hour Input And Residential Electric Furnaces

Product Class	*AFUE (percent)*	*Maximum Electrical Power Consumption*		~~*Compliance date*~~
		Standby	*Off Mode*	
(A) Non-weatherized gas furnaces (not including mobile home furnaces)	80	No requirement		~~November 19, 2015.~~
(B) Mobile Home gas furnaces	80	No requirement		~~November 19, 2015.~~
(C) Non-weatherized oil-fired furnaces (not including mobile home furnaces)	83	11	11	~~July 1, 2013.~~
(D) Mobile Home oil-fired furnaces	75	11	11	~~September 1, 1990.~~
(E) Weatherized gas furnaces	81	No requirement		~~January 1, 2015.~~
(F) Weatherized oil-fired furnaces	78	No requirement		~~January 1, 1992.~~
(G) Electrical furnaces	78	10	10	~~January 1, 1992.~~

(3) **Infrared Gas Space Heaters.** There is no energy efficiency standard or energy design standard for infrared gas space heaters.

(4) **Unit Heaters.** Unit heaters manufactured on or after August 8, 2008 shall:

(A) Be equipped with an intermittent ignition device; and

(B) Have power venting or an automatic flue damper. An automatic vent damper is an acceptable alternative to an automatic flue damper for those unit heaters where combustion air is drawn from the conditioned space.

(5) **Other Gas and Oil Space Heaters.** See ~~S~~section 1605.3(e) of this Article for standards for boilers, central furnaces, combination space-heating and water-heating appliances, and duct furnaces that are not federally- regulated consumer products or federally- regulated commercial and industrial equipment.

(f) Water Heaters.

(1) **~~Large~~ Water Heaters Regulated Under 10 C.F.R. section 430.32(d).** The ~~thermal efficiency and standby loss~~ uniform energy factor of ~~large~~ water heaters regulated under 10 C.F.R. section 430.32(d) ~~manufactured during the applicable time period~~ shall be not less than the applicable values shown in Table F-2.

Table F-2
Standards for Water Heaters Regulated Under 10 C.F.R. Section 430.32(d)

Product Class	***Rated Storage Volume and Input Rating (if applicable)***	***Draw Pattern***	***Minimum Uniform Energy Factor****
Gas-fired Storage Water Heater	≥ 20 gallons and ≤ 55 gallons	Very small	$0.3456 - (0.0020 \times V_r)$
		Low	$0.5982 - (0.0019 \times V_r)$
		Medium	$0.6483 - (0.0017 \times V_r)$
		High	$0.6920 - (0.0013 \times V_r)$
	> 55 gallons and ≤ 100 gallons	Very small	$0.6470 - (0.0006 \times V_r)$
		Low	$0.7689 - (0.0005 \times V_r)$
		Medium	$0.7897 - (0.0004 \times V_r)$
		High	$0.8072 - (0.0003 \times V_r)$
Oil-fired Storage Water Heater	≤ 50 gallons	Very small	$0.2509 - (0.0012 \times V_r)$
		Low	$0.5330 - (0.0016 \times V_r)$
		Medium	$0.6078 - (0.0016 \times V_r)$
		High	$0.6815 - (0.0014 \times V_r)$
Electric Storage Water Heaters	≥ 20 gallons and ≤ 55 gallons	Very small	$0.8808 - (0.0008 \times V_r)$
		Low	$0.9254 - (0.0003 \times V_r)$
		Medium	$0.9307 - (0.0002 \times V_r)$
		High	$0.9349 - (0.0001 \times V_r)$
	> 55 gallons and ≤ 120 gallons	Very small	$1.9236 - (0.0011 \times V_r)$
		Low	$2.0440 - (0.0011 \times V_r)$
		Medium	$2.1171 - (0.0011 \times V_r)$
		High	$2.2418 - (0.0011 \times V_r)$
Tabletop Water Heater	≥ 20 gallons and ≤ 120 gallons	Very small	$0.6323 - (0.0058 \times V_r)$
		Low	$0.9188 - (0.0031 \times V_r)$
		Medium	$0.9577 - (0.0023 \times V_r)$
		High	$0.9884 - (0.0016 \times V_r)$
Instantaneous Gas-fired Water Heater	< 2 gallons and >50,000 Btu/h	Very small	0.80
		Low	0.81
		Medium	0.81
		High	0.81
Instantaneous Electric Water Heater	< 2 gallons	Very small	0.91
		Low	0.91

		Medium	0.91
		High	0.92
Grid-Enabled Water Heater	> 75 gallons	Very small	$1.0136 - (0.0028 \times V_r)$
		Low	$0.9984 - (0.0014 \times V_r)$
		Medium	$0.9853 - (0.0010 \times V_r)$
		High	$0.9720 - (0.0007 \times V_r)$
* V_r = Rated Storage Volume in gallons.			

(2) **Water Heaters Regulated Under 42 U.S.C. 6295(e).** Water heaters regulated under 42 U.S.C. 6295(e) must meet the values shown in Table F-3 as applicable.

Table F-3
Standards for Water Heaters Regulated Under 42 U.S.C. 6295(e)

Product Class	***Minimum Energy Factor****
Gas Water Heater[1]	$0.62 - (0.0019 \times V_r)$
Oil Water Heater[1]	$0.59 - (0.0019 \times V_r)$
Electric Water Heater[1]	$0.95 - (0.0132 \times V_r)$
* Vr = Rated Storage Volume in gallons. [1]Applies to water heaters not covered under 10 C.F.R. section 430.32, including but not limited to storage water heaters > 1 gal and < 20 gal (mini-tank water heaters) and booster water heaters. These standards will take effect on the effective date of a federal test procedure that converts Uniform Energy Factor (UEF) to Energy Factor for these products.	

~~**Table F-2**~~
~~**Standards for Large Water Heaters**~~
~~**Effective October 29, 2003**~~

~~***Appliance***~~	~~***Input to Volume Ratio***~~	~~***Size (Volume)***~~	~~***Minimum Thermal Efficiency (%)***~~	~~***Maximum Standby Loss[1][2]***~~
~~Gas storage water heaters~~	~~< 4,000 Btu/hr/gal~~	~~Any~~	~~80~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Gas instantaneous water heaters~~	~~≥ 4,000 Btu/hr/gal~~	~~< 10 gal~~	~~80~~	~~–~~
		~~≥ 10 gal~~	~~80~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Gas hot water supply boilers~~	~~≥ 4,000 Btu/hr/gal~~	~~< 10 gal~~	~~80~~	~~–~~
		~~≥ 10 gal~~	~~80~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Oil storage water heaters~~	~~< 4,000 Btu/hr/gal~~	~~any~~	~~78~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Oil instantaneous water heaters~~	~~≥ 4,000 Btu/hr/gal~~	~~< 10 gal~~	~~80~~	~~–~~
		~~≥ 10 gal~~	~~78~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Oil hot water supply boilers~~	~~≥ 4,000 Btu/hr/gal~~	~~< 10 gal~~	~~80~~	~~–~~
		~~≥ 10 gal~~	~~78~~	~~$Q/800 + 110(V_r)^{1/2}$ Btu/hr~~
~~Electric storage water heaters~~	~~< 4,000 Btu/hr/gal~~	~~Any~~	~~–~~	~~$0.3 + 27/V_m$ %/hr~~

~~1 Standby loss is based on a 70°F temperature difference between stored water and ambient requirements. In the standby loss equations, V_r is the rated volume in gallons, V_m is the measured volume in gallons, and Q is the nameplate input rate in Btu/hr.~~

~~2 Water heaters and hot water supply boilers having more than 140 gallons of storage capacity are not required to meet the standby loss requirement if the tank surface is thermally insulated to R-12.5, if a standing pilot light is not installed, and for gas- or oil-fired storage water heaters, there is a flue damper or fan-assisted combustion.~~

(~~2~~3) **~~Small~~ Water Heaters Regulated Under 10 C.F.R. section 431.110.** ~~The energy factor of all small water heaters that are federally regulated consumer products, (other than booster water heaters, hot water dispensers, and mini-tank electric water heaters) shall be not less than the applicable values shown in Table F-3.~~Water heaters regulated under 10 C.F.R. section 431.110 must meet the values shown in Tables F-4 and F-5, as applicable.

(A) **Commercial Storage Water Heaters, Instantaneous Water Heaters, and Hot Water Supply Boilers (Excluding Residential-Duty Commercial Water Heaters).** Each commercial storage water heater, instantaneous water heater, and hot water supply boiler (excluding residential-duty commercial water heaters) must meet the applicable energy conservation standard level(s) as specified in Table F-4.

1. **Packaged Boiler Exclusion.** Any packaged boiler that provides service water that meets the definition of "commercial packaged boiler" in section 1602(e) of this Article, but does not meet the definition of "hot water supply boiler" in section 1602(f) of this Article, must meet the requirements that apply to it under section 1605.1(e) of this Article.

Table F-~~3~~4
Standards for ~~Small Federally-Regulated~~ Water Heaters Regulated Under 10 C.F.R. Section 431.110(a) (Excluding Residential-Duty Commercial Water Heaters)

Equipment Category	***Size***	***Energy Conservation Standards*** [a]	
		Maximum standby loss [c] ***(equipment manufactured on and after October 29, 2003)*** [b]	***Minimum thermal efficiency (equipment manufactured on and after October 9, 2015)*** [b] ***(%)***
Electric storage water heaters	All	$0.30 + 27/V_m$ (%/hr)	N/A
Gas-fired storage water heaters	≤ 155,000 Btu/hr	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	80
	> 155,000 Btu/hr	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	80
Oil-fired storage water heaters	≤ 155,000 Btu/hr	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	80
	> 155,000 Btu/hr	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	80
Gas-fired instantaneous water heaters and hot water supply boilers	< 10 gallons	N/A	80
	≥ 10 gallons	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	80
Oil-fired instantaneous water heaters and hot water supply boilers	< 10 gallons	N/A	80
	≥ 10 gallons	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)	78

[a] V_m is the measured storage volume (in gallons), and V_r is the rated volume (in gallons). Q is the nameplate input rate in Btu/hr.

[b] For hot water supply boilers with a capacity of less than 10 gallons: (1) The standards are mandatory for products manufactured on and after October 21, 2005; and (2) products manufactured prior to that date, and on or after October 23, 2003, must meet either the standards listed in Table F-3 or the applicable standards in Table E-4 of this Article for a "commercial packaged boiler."

[c] Water heaters and hot water supply boilers having more than 140 gallons of storage capacity need not meet the standby loss requirement if: (1) The tank surface area is thermally insulated to R-12.5 or more; (2) a standing pilot light is not used; and (3) for gas or oil-fired storage water heaters, they have a fire damper or fan-assisted combustion.

~~Appliance~~	~~Rated Storage Volume (gallons)~~	~~Minimum Energy Factor~~
		~~Effective April 16, 2015~~
~~Gas-fired storage-type water heaters~~	~~≤ 55~~	~~0.675−(0.0015 × V)~~
	~~> 55~~	~~0.8012−(0.00078 × V)~~
~~Oil-fired water heaters (storage)~~	~~Any~~	~~0.68 − (.0019 x V)~~
~~Electric storage water heaters (excluding tabletop water heaters)~~	~~≤ 55~~	~~0.960−(0.0003 × V)~~
	~~> 55~~	~~2.057−(0.00113 × V)~~
~~Tabletop water heaters~~	~~Any~~	~~0.93 − (.00132 x V)~~
~~Gas-fired instantaneous water heaters~~	~~Any~~	~~0.82 − (.0019 x V)~~
~~Electric instantaneous water heaters (excluding tabletop water heaters)~~	~~Any~~	~~0.93 − (.00132 x V)~~
~~Heat pump water heaters~~	~~Any~~	~~0.97 − (.00132 x V)~~
~~V = Rated storage volume in gallons.~~		

(B) **Residential-Duty Commercial Water Heaters.** Each residential-duty commercial water heater must have a minimum uniform energy factor not less than the values shown in Table F-5.

Table F-5
Standards for Residential-Duty Commercial Water Heaters

Product Class	Specifications [a]	Draw Pattern	Minimum Uniform Energy Factor [b]
Gas-fired Storage	> 75 kBtu/hr and ≤ 105 kBtu/hr and ≤ 120 gallons	Very Small	0.2674 − (0.0009 × V_r)
		Low	0.5362 − (0.0012 × V_r)
		Medium	0.6002 − (0.0011 × V_r)
		High	0.6597 − (0.0009 × V_r)
Oil-fired Storage	> 105 kBtu/hr and ≤ 140 kBtu/hr and ≤ 120 gal	Very Small	0.2932 − (0.0015 × V_r)
		Low	0.5596 − (0.0018 × V_r)
		Medium	0.6194 − (0.0016 × V_r)
		High	0.6740 − (0.0013 × V_r)
Electric Instantaneous	> 12 kW and ≤ 58.6 kW and ≤ 2 gal	Very Small	0.80
		Low	0.80
		Medium	0.80
		High	0.80

[a] Additionally, to be classified as a residential-duty commercial water heater, a commercial water heater must meet the following conditions:
(1) if the water heater requires electricity, it must use a single-phase external power supply; and
(2) the water heater must not be designed to heat water to temperatures greater than 180°F.
[b] V_r is the rated storage volume (in gallons), as determined pursuant to 10 CFR section 429.44.

~~(3) **Booster Water Heaters.** There is no energy efficiency standard or energy design standard for booster water heaters.~~

~~(4) **Other Water Heaters.** See Section 1605.3(f) for standards for other water heaters.~~

(~~4~~5) **Combination Space-Heating and Water-Heating Appliances.** See ~~S~~section 1605.3(e) of this Article for standards for combination space-heating and water-heating appliances.

(g) Pool Heaters, Portable Electric Spas, Pumps, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.

(1) **Energy Efficiency Standard for ~~Gas-Fired Pool Heaters and Oil~~Fossil Fuel-Fired Pool Heaters.** The thermal efficiency of ~~gas-fired pool heaters and oil~~fossil fuel-fired pool heaters manufactured on or after the effective dates shown shall be not less than the values shown in Table G-~~2~~1.

Table G-~~2~~1
Standards for ~~Gas-Fired Pool Heaters and Oil~~Fossil Fuel-Fired Pool Heaters

Appliance	*Effective Date*	*Minimum Thermal Efficiency (%)*
Gas-Fired Pool Heaters	~~January 1, 1990~~	~~78~~
	April 16, 2013	82
Oil-Fired Pool Heaters	January 1, 1990	78

(2) **Energy Efficiency Standards for Heat Pump Pool Heaters.** See ~~S~~section 1605.3(g) of this Article for energy efficiency standards for heat pump pool heaters.

(3) **Energy Efficiency Standard for Electric Resistance Pool Heaters.** There is no energy efficiency standard for electric resistance pool heaters.

(4) **Energy Design Standards for Pool Heaters.** See ~~S~~section 1605.3(g) of this Article for energy design standards for pool heaters.

(5) **Energy Efficiency Standards for Portable Electric Spas.** See ~~S~~section 1605.3(g) of this Article for energy efficiency standards for portable electric spas.

(6) **Energy Efficiency Standards for Pumps**

(A) For the purposes of section 1605.1(g)(6)(B) of this Article, "PEI_{CL}" means the constant load pump energy index and "PEI_{VL}" means the variable load pump energy index, both as determined in accordance with the test procedure in section 1604(g)(4) of this Article. For the purposes of section 1605.1(g)(6)(C) of this Article, "BEP" means the best efficiency point as determined in accordance with the test procedure in section 1604(g)(4) of this Article.

(B) **Pump Efficiency Standards.** Each pump that is manufactured on or after January 27, 2020 and that:

1. is in one of the equipment classes listed in Table G-2 in section 1605.1(g)(6)(B)4 of this Article;

2. meets the definition of a "clean water pump" in section 1602(g) of this Article;

3. is not listed in section 1605.1(g)(6)(C) of this Article; and

4. conforms to the characteristics listed in section 1605.1(g)(6)(D) of this Article must have a PEI_{CL} or PEI_{VL} rating of not more than 1.00 using the appropriate C-value in Table G-2:

Table G-2
Standards for Pumps Manufactured On or After January 27, 2020

Equipment class[1]	*Maximum PEI*[2]	*C-value*[3]
ESCC.1800.CL	1.00	128.47
ESCC.3600.CL	1.00	130.42
ESCC.1800.VL	1.00	128.47
ESCC.3600.VL	1.00	130.42
ESFM.1800.CL	1.00	128.85
ESFM.3600.CL	1.00	130.99
ESFM.1800.VL	1.00	128.85
ESFM.3600.VL	1.00	130.99
IL.1800.CL	1.00	129.30
IL.3600.CL	1.00	133.84
IL.1800.VL	1.00	129.30
IL.3600.VL	1.00	133.84
RSV.1800.CL	1.00	129.63
RSV.3600.CL	1.00	133.20
RSV.1800.VL	1.00	129.63
RSV.3600.VL	1.00	133.20
ST.1800.CL	1.00	138.78
ST.3600.CL	1.00	134.85
ST.1800.VL	1.00	138.78
ST.1800.VL	1.00	134.85

[1] Equipment class designations consist of a combination (in sequential order separated by periods) of: (1) An equipment family (ESCC = end suction close-coupled, ESFM = end suction frame mounted/own bearing, IL = in-line, RSV = radially split, multi-stage, vertical, in-line diffuser casing, ST = submersible turbine; all as defined in 10 C.F.R. section 431.462); (2) nominal speed of rotation (1800 = 1800 rpm, 3600 = 3600 rpm); and (3) an operating mode (CL = constant load, VL = variable load). Determination of the operating mode is determined using the test procedure in appendix A to this subpart.

[2] For equipment classes ending in .CL, the relevant PEI is PEI_{CL}. For equipment classes ending in .VL, the relevant PEI is PEI_{VL}.

[3] The C-values shown in this table must be used in the equation for PERSTD when calculating PEI_{CL} or PEI_{VL}, as described in section II.B of 10 C.F.R. Appendix A to subpart Y of part 431.

(C) **Exceptions to Pump Efficiency Standards.** The energy efficiency standards in section 1605.1(g)(6)(B) of this Article do not apply to the following pumps:

1. fire pumps;

2. self-priming pumps;

3. prime-assist pumps;

4. magnet driven pumps;

5. pumps designed to be used in a nuclear facility subject to 10 C.F.R. part 50, "Domestic Licensing of Production and Utilization Facilities";

6. pumps meeting the military specification design and construction requirements set forth in 10 C.F.R. section 431.465(c)(6).

(D) **Characteristics of Regulated Pumps.** The energy conservation standards in section 1605.1(g)(6)(B) of this Article apply only to pumps that have the following characteristics:

1. flow rate of 25 gpm or greater at BEP at full impeller diameter;

2. maximum head of 459 feet at BEP at full impeller diameter and the number of stages required for testing;

3. design temperature range from 14 to 248 °F;

4. designed to operate with either:

   a. a 2- or 4-pole induction motor; or

   b. a non-induction motor with a speed of rotation operating range that includes speeds of rotation between 2,880 and 4,320 revolutions per minute and/or 1,440 and 2,160 revolutions per minute; and

   c. in either case, the driver and impeller must rotate at the same speed;

5. for ST pumps, a 6-inch or smaller bowl diameter; and

6. for ESCC and ESFM pumps, specific speed less than or equal to 5,000 when calculated using U.S. customary units.

(~~6~~7) **Energy Efficiency Standards and Energy Design Standards for Residential Pool Pump and Motor Combinations and Replacement Residential Pool Pump Motors.** See ~~S~~section 1605.3(g) of this Article for energy efficiency standards and energy design standards for residential pool pump and motor combinations and replacement residential pool pump motors.

(h) Plumbing Fittings.

(1) **Metering Faucets and Wash Fountains.** The flow rate of wash fountains and metering faucets shall be not greater than the applicable values shown in Table H-1.

Table H-1
Standards for Plumbing Fittings

Appliance	*Maximum Flow Rate*
Wash fountains	$2.2 \times \frac{\text{rim space (inches)}}{20}$ gpm at 60 psi
Metering faucets	0.25 gallons/cycle [1,2]
Metering faucets for wash fountains	$0.25 \times \frac{\text{rim space (inches)}}{20}$ gpm at 60 psi [1,2]

[1] **Sprayheads with independently-controlled orifices and manual controls.** The maximum flow rate of each orifice that delivers a preset volume of water before gradually shutting itself off shall not exceed the maximum flow rate for a metering faucet.
[2] **Sprayheads with collectively controlled orifices and metered controls.** The maximum flow rate of a sprayhead that delivers a preset volume of water before gradually shutting itself off shall be the product of (a) the maximum flow rate for a metering faucet and (b) the number of component lavatories (rim space of the lavatory in inches (millimeters) divided by 20 inches (508 millimeters)).

(2) **Showerhead-Tub Spout Diverter Combinations.** Showerhead-tub spout diverter combinations shall meet both the standard for showerheads and the standard for tub spout diverters.
(3) **Tub Spout Diverters.** See ~~S~~section 1605.3(h) of this Article for standards for tub spout diverters.

(4) **Commercial Pre-rinse Spray Valves.**

(A) The flow rate of commercial pre-rinse spray valves manufactured on or after January 1, 2006 and before January 28, 2019 shall be equal to or less than 1.6 gpm at 60 psi.

(B) The flow rate of commercial pre-rinse spray valves manufactured on or after January 28, 2019 shall be equal to or less than the values shown in Table H-2.

Table H-2
Standards for Commercial Pre-rinse Spray Valves
Manufactured On or After January 28, 2019

Product Class (spray force in ounce force (ozf))	*Maximum Flow Rate (gpm)*
Product Class 1 (≤ 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and ≤ 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

(C) See section 1605.3(h) of this Article for design standards for commercial pre-rinse spray valves.

(5) **Showerheads, lavatory faucets, kitchen faucets, aerators, and public lavatory faucets**. See ~~S~~section 1605.3 (h) of this Article for standards for all showerheads, lavatory faucets, kitchen faucets, aerators, and public lavatory faucets sold or offered for sale in California.

~~(A) The flow rate of commercial pre-rinse spray valves manufactured on or after January 1, 2006 shall be equal to or less than 1.6 gpm at 60 psi.~~

~~(B) See Section 1605.3(h) for design standards for commercial pre-rinse spray valves.~~

(i) Plumbing Fixtures.

See ~~S~~section 1605.3(i) of this Article for water efficiency standards for plumbing fixtures.

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

~~(1) The ballast efficacy factor of the following types of fluorescent lamp ballasts shall be not less than the applicable values shown in Tables J-12 and J-23, except those fluorescent lamp ballasts (i) designed for dimming to 50 percent or less of maximum output, (ii) designed for use with two F96T12HO lamps, in ambient temperatures of 20°F or less, or (iii) with a power factor of less than 0.90 and designed and labeled for use only in residential buildings are excluded:~~

~~(A) replacement fluorescent lamp ballasts manufactured on or before June 30, 2010;~~

~~(B) fluorescent lamp ballasts manufactured on or after January 1, 1990;~~

~~(C) fluorescent lamp ballasts sold by the manufacturer on or after April 1, 1990; and~~

~~(D) fluorescent lamp ballasts incorporated into a luminaire by a luminaire manufacturer on or after April 1, 1991.~~

~~**Table J-1**~~
~~**Standards for Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp Ballasts**~~

~~*Application for Operation of*~~	~~*Ballast Input Voltage*~~	~~*Total Nominal Lamp Watts*~~	~~*Minimum Ballast Efficacy Factor*~~	
~~one F40T12 lamp~~	~~120 or 277~~	~~40~~	~~2.29[1]~~	~~1.805[2]~~
~~two F40T12 lamps~~	~~120~~	~~80~~	~~1.17[1]~~	~~1.060[2]~~
	~~277~~	~~80~~	~~1.17[1]~~	~~1.050[2]~~
~~two F96T12 lamps~~	~~120 or 277~~	~~150~~	~~0.63[1]~~	~~0.570[2]~~
~~two F96T12HO lamps~~	~~120 or 277~~	~~220~~	~~0.39[1]~~	~~0.390[2]~~

~~[1] For fluorescent lamp ballasts manufactured on or after April 1, 2005; sold by the manufacturer on or after July 1, 2005; or incorporated into a luminaire by a luminaire manufacturer on or after April 1, 2006.~~

~~[2] For fluorescent lamp ballasts designed, marked, and shipped as replacement ballasts.~~

~~**Table J-2**~~
~~**Standards for Fluorescent Lamp Ballasts[1]**~~

~~*Application for Operation of*~~	~~*Ballast Input Voltage*~~	~~*Total Nominal Lamp Watts*~~	~~*Minimum Ballast Efficacy Factor*~~
~~one F34T12 lamp~~	~~120 or 277~~	~~34~~	~~2.61~~
~~two F34T12 lamps~~	~~120 or 277~~	~~68~~	~~1.35~~
~~two F96T12/ES lamps~~	~~120 or 277~~	~~120~~	~~0.77~~
~~two F96T12HO/ES lamps~~	~~120 or 277~~	~~190~~	~~0.42~~

~~[1] For fluorescent lamp ballasts manufactured on or after July 1, 2009; sold by the manufacturer on or after October 1, 2009; or fluorescent lamp ballasts incorporated into a luminaire by a luminaire manufacturer on or after July 1, 2010.~~

~~(2) All fluorescent lamp ballasts covered by Tables J-12 or J-23 except replacement fluorescent lamp ballasts shall have a power factor of 0.90 or greater.~~

~~(3)~~(1) **Fluorescent lamp ballasts (other than dimming ballasts).** Except as provided in sections 1605.1(j)(~~4~~2) and 1605.1(j)(3) of this Article, each fluorescent lamp ballast:—

(A) Manufactured on or after November 14, 2014;

(B) Designed and marketed:
1. To operate at nominal input voltages at or between 120 and 277 volts;
2. To operate with an input current frequency of 60 Hertz; and
3. For use in connection with fluorescent lamps (as defined in 10 C.F.R. part 430, section 430.2)

(C) Shall have:
1. A power factor of 0.9 or greater except for ~~those~~ ballasts that are not residential ballasts ~~defined in paragraph (j)(3)(C)(2) of this section~~;
2. A power factor of 0.5 or greater for residential ballasts~~, which are defined in (j)(3)(D) of this section~~;
3. A ballast luminous efficiency not less than the values shown in Table J-~~3~~2:

Table J-~~3~~2
Standards for Fluorescent Lamp Ballasts, Except for Certain Dimming Ballasts ~~Luminous Efficiency~~
Applicable to Models Described in Section 1605.1(j)(~~3~~1) of this Article

BLE = A/(1+B*average total lamp arc power ^ −C) Where A, B, and C are as follows:

Description	*A*	*B*	*C*
Instant start and rapid start ballasts (not classified as residential) that are designed to operate	0.993	0.27	0.25
4-foot medium bipin lamps.			
2-foot U-shaped lamps.			
8-foot slimline lamps.			
Programmed start ballasts (not classified as residential) that are designed to operate	0.993	0.51	0.37
4-foot medium bipin lamps.			
2-foot U-shaped lamps.			
4-foot miniature bipin standard output lamps.			
4-foot miniature bipin high output lamps.			
Instant start and rapid start ballasts (not classified as sign ballasts) that are designed to operate 8-foot high output lamps.	0.993	0.38	0.25
Programmed start ballasts (not classified as sign ballasts) that are designed to operate 8-foot high output lamps.	0.973	0.70	0.37
Sign ballasts that operate 8-foot high output lamps	0.993	0.47	0.25
Instant start and rapid start residential ballasts that operate	0.993	0.41	0.25
4-foot medium bipin lamps.			
2-foot U-shaped lamps.			
8-foot slimline lamps.			
Programmed start residential ballasts that are designed to operate	0.973	0.71	0.37
4-foot medium bipin lamps.			
2-foot U-shaped lamps.			

~~4. Instant start, rapid start, and programmed start are defined in Appendix Q1 of subpart B of 10 C.F.R. part 430. Average total lamp are power is as defined and measured in accordance with Appendix Q1 of subpart B of 10 C.F.R. part 430.~~

~~5. Sign ballasts have an Underwriters Laboratories Inc. Type 2 rating and are designed, labeled, and marketed for use in outdoor signs.~~

~~6. Residential ballasts meet FCC consumer limits as set forth in 47 C.F.R. part 18 and are designed and labeled for use in residential applications.~~

~~(4) The standards described in section 1605.1(j)(3) of this Article do not apply to:~~

~~(A) A ballast that is designed for dimming to 50 percent or less of the maximum output of the ballast except for those specified in section 1605.1(j)(5) of this Article; and~~

~~(B) A low frequency ballast (as defined in Appendix Q1 of subpart B of 10 C.F.R. part 430) that:~~

~~1. Is designed to operate T8 diameter lamps;~~

~~2. Is designed, labeled, and marketed for use in EMI-sensitive environments only;~~

~~3. Is shipped by the manufacturer in packages containing 10 or fewer ballasts; and~~

~~(C) A programmed start ballast that operates 4-foot medium bipin T8 lamps and delivers on average less than 140 milliamperes to each lamp.~~

(5<u>2</u>) **<u>Certain Dimming Ballasts.</u>** ~~Each fluorescent lamp ballast~~ <u>Except as provided in section 1605.1(j)(3) of this Article, each dimming ballast:</u>

(A) Manufactured on or after November 14, 2014<u>; designed and marketed to operate one F34T12, two F34T12, two F96T12/ES, or two F96T12HO/ES lamps; and</u>

(B) Designed <u>and marketed:</u>

1. To operate at nominal input voltages of 120 or 277 volts;
2. To operate with an input current frequency of 60 Hertz<u>; and</u>
3. For use in connection with fluorescent lamps (as defined in 10 C.F.R. part 430, section 430.2); ~~and~~

~~4. For dimming to 50 percent or less of the maximum output of the ballast~~

(C) ~~Shall~~ Must have a power factor of:

1. ~~A power factor of~~ 0.9 or greater ~~except~~ for ~~those~~ ballasts ~~defined in section 1605.1(j)(3)(C)2. of this Article~~ that are not residential ballasts; or
2. ~~A power factor of~~ 0.5 or greater for residential ballasts~~, which meet FCC Part B consumer limits and are designed and labeled for use only in residential applications~~; and

~~3.~~(D) A ballast luminous efficiency ~~of~~ not less than the values shown in Table J-~~4~~3:

Table J-43
Standards for Certain Dimming Fluorescent Lamp Ballasts, Ballast Luminous Efficiency Applicable to Models Described in ~~S~~section 1605.1(j)(~~5~~2) of this Article

Designed for the operation of	*Ballast input voltage*	*Total nominal lamp watts*	*Ballast luminous efficiency*	
			Low frequency ballasts	*High frequency ballasts*
One F34T12 lamp	120/277	34	0.777	0.778
Two F34T12 lamps	120/277	68	0.804	0.805
Two F96T12/ES lamps	120/277	120	0.876	0.884
Two F96T12HO/ES lamps	120/277	190	0.711	0.713

Exceptions to Sections 1605.1(j)(1) and 1605.1(j)(2). The power factor and ballast luminous efficiency standards described in sections 1605.1(j)(1) and 1605.1(j)(2) of this Article do not apply to:

(1) a dimming ballast designed and marketed to operate exclusively lamp types other than one F34T12, two F34T12, two F96T12/ES, or two F96T12HO/ES lamps;

(2) a low frequency ballast that is designed and marketed to operate T8 diameter lamps; is designed and marketed for use in electromagnetic-interference-sensitive-environments only; and is shipped by the manufacturer in packages containing 10 or fewer ballasts; or

(3) a programmed start ballast that operates 4-foot medium bipin T8 lamps and delivers on average less than 140 milliamperes to each lamp.

(~~6~~3) **Mercury Vapor Lamp Ballasts.** Mercury vapor lamp ballasts, other than specialty application mercury vapor lamp ballasts, shall not be manufactured or imported into the United States after January 1, 2008.

~~(7) There are no energy efficiency standards or energy design standards for ballasts designed to operate T5 lamps, T8 lamps, three T12 lamps, or four T12 lamps.~~

(k) Lamps.

(1) **Federally- Regulated General Service Fluorescent Lamps.**

~~(A) **General Service Fluorescent Lamps Manufactured Before July 15, 2012.** The average lamp efficacy and the color rendering index of federally regulated general service fluorescent lamps manufactured before July 15, 2012 shall be not less than the applicable values shown in Table K-2.~~

~~**Table K-2**~~
~~**Standards for Federally-Regulated General Service Fluorescent Lamps Manufactured Before July 15, 2012**~~

~~*Appliance*~~	~~*Nominal Lamp Wattage*~~	~~*Minimum Color Rendering Index (CRI)*~~	~~*Minimum Average Lamp Efficacy (LPW)*~~
~~4-foot medium bi-pin lamps~~	~~> 35~~	~~69~~	~~75.0~~

	~~≤ 35~~	~~45~~	~~75.0~~
~~2-foot U-shaped lamps~~	~~> 35~~	~~69~~	~~68.0~~
	~~≤ 35~~	~~45~~	~~64.0~~
~~8-foot slimline lamps~~	~~> 65~~	~~69~~	~~80.0~~
	~~≤ 65~~	~~45~~	~~80.0~~
~~8-foot high output lamps~~	~~> 100~~	~~69~~	~~80.0~~
	~~≤ 100~~	~~45~~	~~80.0~~

~~(B) **General Service Fluorescent Lamps Manufactured On or After July 15, 2012.** The correlated color temperature and minimum average lamp efficacy (LPW) of~~ Each of the following federally- regulated general service fluorescent lamps manufactured on or after the effective dates shown shall ~~be not less than~~ meet or exceed the ~~applicable values~~ lamp efficacy standards shown in Table K-~~32~~.

Table K-~~32~~
Standards for Federally- Regulated General Service Fluorescent Lamps
Manufactured On or After July 15, 2012

Appliance	***Correlated Color Temperature***	***Minimum Average Lamp Efficacy (LPW)***	
		Effective July 15, 2012	***Effective January 26, 2018***
4-foot medium bipin lamps	≤ 4,500K	89	92.4
	> 4,500K and ≤ 7,000K	88	88.7
2-foot U-shaped lamps	≤ 4,500K	84	85.0
	> 4,500K and ≤ 7,000K	81	83.3
8-foot slimline lamps	≤ 4,500K	97	97.0
	> 4,500K and ≤ 7,000K	93	93.0
8-foot high output lamps	≤ 4,500K	92	92.0
	> 4,500K and ≤ 7,000K	88	88.0
4-foot miniature bipin standard output	≤ 4,500K	86	95.0
	> 4,500K and ≤ 7,000K	81	89.3
4-foot miniature bipin high output	≤ 4,500K	76	82.7
	> 4,500K and ≤ 7,000K	72	76.9

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

~~(A)~~ **Federally Regulated Incandescent Reflector Lamps Manufactured On or After ~~Before~~ July 15, 2012.** The average lamp efficacy of federally-regulated incandescent reflector lamps with a rated lamp wattage between 40-205 watts, and manufactured on or after ~~November 2, 1995 and manufactured before~~ July 15, 2012 shall be not less than the applicable values shown in Table K-~~43~~, subject to the following~~.~~:

~~1.~~(A) The standards specified in Table K-~~43~~ shall apply with respect to:

~~a.~~1. ER incandescent reflector lamps, BR incandescent reflector lamps, BPAR incandescent reflector lamps, and similar bulb shapes on and after January 1, 2008; and

~~b.~~2. Incandescent reflector lamps with a diameter of more than 2.25 inches, but not more than 2.75 inches, on and after June 15, 2008.

~~2.~~ **EXCEPTION to Section 1605.1(k)(2).** The standards specified in Table K-~~43~~ shall not apply to the following types of incandescent reflector lamps:

~~a.~~(1) Lamps rated at 50 watts or less that are ER30, BR30, BR40, or ER40;
~~b.~~(2) Lamps rated at 65 watts that are BR30, BR40, or ER40 lamps; or
~~c.~~(3) R20 incandescent reflector lamps rated 45 watts or less~~; and~~

~~d. R20 short lamps.~~

~~Table K-4~~
~~Standards for Federally-Regulated Incandescent Reflector Lamps~~
~~Manufactured Before July 15, 2012~~

~~*Nominal Lamp Wattage*~~	~~*Minimum Average Lamp Efficacy (LPW)*~~
~~40-50~~	~~10.5~~
~~51-66~~	~~11.0~~
~~67-85~~	~~12.5~~
~~86-115~~	~~14.0~~
~~116-155~~	~~14.5~~
~~156-205~~	~~15.0~~

~~(B) **Incandescent Reflector Lamps Manufactured on or After July 15, 2012.** The average lamp efficacy of federally-regulated incandescent reflector lamps with rated lamp wattage between 40 – 205 watts, and manufactured on or after July 15, 2012, shall be not less than the applicable values shown in Table K-5.~~

Table K-~~5~~3

Standards for Federally- Regulated Incandescent Reflector Lamps
Manufactured On or After July 15, 2012

Lamp Spectrum	*Lamp Diameter (inches)*	*Rated Voltage*	*Minimum Average Lamp Efficacy (LPW)*[1]
Standard Spectrum	> 2.5	≥ 125	$6.8 \times P^{0.27}$
		< 125	$5.9 \times P^{0.27}$
	≤ 2.5	≥ 125	$5.7 \times P^{0.27}$
		< 125	$5.0 \times P^{0.27}$
Modified Spectrum	> 2.5	≥ 125	$5.8 \times P^{0.27}$
		< 125	$5.0 \times P^{0.27}$
	≤ 2.5	≥ 125	$4.9 \times P^{0.27}$
		< 125	$4.2 \times P^{0.27}$
[1]P = Rated Lamp Wattage, in Watts			

(3) **Medium Base Compact Fluorescent Lamps.** A bare ~~lamp and~~or covered lamp (no reflector) medium base compact fluorescent lamp manufactured on or after January 1, 2006~~8, 2007~~, shall meet the requirements set forth in Table K-~~6~~4.

Table K-~~6~~4
Standards for Medium Base Compact Fluorescent Lamps

Factor	*Requirements*
~~Lamp Power~~Labeled Wattage (Watts) and Configuration[1]	*~~Minimum~~ Measured Initial Lamp Efficacy: lumens/watt must be at least: ~~(Based upon initial lumen data)~~[2]*
Bare Lamp:	
~~Lamp Power~~Labeled Wattage < 15	45.0
~~Lamp Power~~Labeled Wattage ≥ 15	60.0
Covered Lamp (no reflector)	
~~Lamp Power~~Labeled Wattage < 15	40.0
15 ≥ ~~Lamp Power~~Labeled Wattage < 19	48.0
19 ≥ ~~Lamp Power~~Labeled Wattage < 25	50.0
~~Lamp Power~~Labeled Wattage ≥ 25	55.0
~~1,000-hour~~ Lumen Maintenance at 1,000-hours	~~The average of at least 5 lamps must be a minimum≥90% of initial (100-hour) lumen output @ 1,000 hours of rated life.~~
Lumen Maintenance at 40% of Lifetime[2]	~~80% of initial (100-hour) rating at 40 percent of rated life (per ANSI C78.5 Clause 4.10).~~
Rapid Cycle Stress Test	~~Per ANSI C78.5 and IESNA LM-65 (Clauses 2, 3, 5, and 6) *Exception:* Cycle times must be 5 minutes on, 5 minutes off. L~~Each lamp ~~will~~ must be cycled once for every two hours of ~~rated~~ lifetime.[2] At least 5 lamps must meet or exceed the minimum number of cycles.
~~Average Rated Lamp~~ Lifetime[2]	≥ 6,000 ~~hours as declared by the manufacturer on the packaging. 80% of rated life, statistical methods may be used to confirm lifetime claims based on sampling performance.~~
[1] Use labeled wattage to determine the appropriate efficacy requirements in this table; do not use measured wattage for this purpose.~~Take performance and electrical requirements at the end of the 100-hour aging period according to ANSI Standard C78.5. The lamp efficacy shall be the average of the lesser of the lumens per watt measured in the base up and/or other specified positions. Use wattages placed on packaging to select proper specification efficacy in this table, not measured wattage. Labeled wattages are for reference only.~~	
[2] Lifetime refers to lifetime of a compact fluorescent lamp as defined in section 1602(k) of this Article.~~Efficacies are based on measured values for lumens and wattages from pertinent test data. Wattages and lumens placed on packages may not be used in calculation and are not governed by this specification. For multi-level or dimmable systems, measurements shall be at the highest setting. Acceptable measurement error is ±3%.~~	

(4) **Federally- Regulated General Service Incandescent Lamps and Modified Spectrum General Service Incandescent Lamps.** The energy consumption rate of federally regulated general service incandescent lamps and modified spectrum general service incandescent lamps, manufactured on or after the effective dates shown, shall be no greater than the maximum rated wattage shown in Tables K-~~7~~5 and K-~~8~~6.

(A) These standards apply to each lamp that:
~~(i)~~1. is intended for a general service or general illumination application (whether incandescent or not);
~~(ii)~~2. has a medium screw base or any other screw base not defined in ANSI C81.61- 2006;
~~(iii)~~3. is capable of being operated at a voltage at least partially within the range of 110 to 130 volts; and
~~(iv)~~4. is manufactured or imported after December 31, 2011.

(B) Each lamp described in ~~S~~section 1604(k)(4)(A) of this Article shall have a color rendering index that is greater than or equal to:

1. 80 for nonmodified spectrum lamps; or
2. 75 for modified spectrum lamps.

Table K-~~7~~5
Standards for Federally- Regulated General Service Incandescent Lamps

Rated Lumen Ranges	*Maximum Rate Wattage*	*Minimum Rate Lifetime*	*Effective Date*
1490-2600	72	1,000 hours	January 1, 2012
1050 – 1489	53	1,000 hours	January 1, 2013
750 – 1049	43	1,000 hours	January 1, 2014
310 – 749	29	1,000 hours	January 1, 2014

Table K-~~8~~6
Standards for Federally- Regulated Modified Spectrum General Service Incandescent Lamps

Rated Lumen Ranges	*Maximum Rate Wattage*	*Minimum Rate Lifetime*	*Effective Date*
1118-1950	72	1,000 hours	January 1, 2012
788-1117	53	1,000 hours	January 1, 2013
563-787	43	1,000 hours	January 1, 2014
232-562	29	1,000 hours	January 1, 2014

(5) **Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps.** The energy consumption rate of federally regulated candelabra base incandescent lamps and intermediate base incandescent lamps, manufactured on or after January 1, 2012, shall be no greater than the maximum rated wattage shown in Tables K-~~9~~7.

Table K-~~9~~7
Standards for Federally Regulated Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps

Lamp Base Type	*Maximum Rated Wattage*
Candelabra	60
Intermediate	40

~~(6) See Section 1605.3(k) for energy efficiency standards for state-regulated general service incandescent lamps and state-regulated incandescent reflector lamps.~~

(l) Emergency Lighting and Self-Contained Lighting Controls.

(1) ~~The input power demand of a~~An illuminated exit sign~~s~~ manufactured on or after January 1, 2006 shall have an input power demand of ~~not exceed~~ five watts or less per face.

(2) See ~~S~~section 1605.3(l) of this Article for energy design standards for self-contained lighting controls.

(m) Traffic Signal Modules ~~and Traffic Signal Lamps~~.

(1) **Traffic Signals for Vehicle and Pedestrian Control.** Federally regulated traffic signals for vehicle and pedestrian control manufactured on or after January 1, 2006 shall have a nominal wattage and maximum wattage no greater than the values shown in Table M-1, and shall be installed with compatible electrically connected signal control interface devices and conflict monitoring systems.

Table M-1
Standards for Traffic Signals for Vehicle and Pedestrian Control

Appliance	*Maximum Wattage (at 74°C)*	*Nominal Wattage (at 25°C)*
Traffic Signal Module Type:		
12-inch; Red Ball	17	11
8-inch; Red Ball	13	8
12-inch; Red Arrow	12	9
12-inch; Green Ball	15	15
8-inch; Green Ball	12	12
12-inch; Green Arrow	11	11
Pedestrian Module Type:		
Combination Walking Man/Hand	16	13
Walking Man	12	9
Orange Hand	16	13

(2) See ~~S~~section 1605.3(m) of this Article for energy efficiency standards for traffic signal modules for pedestrian control sold or offered for sale in California.

(n) Luminaires and Torchieres.

(1) **Torchieres**. Torchieres manufactured on or after January 1, 2006 shall consume not more than 190 watts of power and shall not be capable of operating with lamps that total more than 190 watts.
~~(A) A pulse-start metal halide ballast with a minimum ballast efficiency of 88 percent on or after January 1, 2010.~~

(2) **Metal Halide Lamp Fixtures**.

(A) See ~~S~~section 1605.3(n) of this Article 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 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:~~shown in Table N-1.

Table N-1
Standards for Metal Halide Lamp Fixtures Manufactured On or After February 10, 2017

Designed to be operated with lamps of the following rated lamp wattage	***Tested input voltage‡‡***	***Minimum standard equation‡‡ %***
≥50 W and ≤ 100 W	Tested at 480 V	(1/(1+1.24×P^(-0.351))) – 0.020††;
≥50 W and ≤ 100 W	All Others	1/1+1.24×P^(-0.351))
>100 W and <150†; W	Tested at 480 V	(1/(1+1.24×P^(-0.351))) – 0.020
>100 W and <150†; W	All Others	1/1+1.24×P^(-0.351))
>500 W and ≤1000 W	Tested at 480 V	For >500 W and ≤750 W: 0.900
		For >750 W and ≤1000 W: 0.000104×P+0.822
		For >500 W and ≤1000 W: may not utilize a probe-start ballast
>500 W and ≤1000 W	All Others	For >500 W and ≤750 W: 0.910
		For >750 W and ≤1000 W: 0.000104×P+0.832
		For >500 W and ≤1000 W: may not utilize a probe-start ballast
† Includes 150 W fixtures specified in 10 C.F.R. section 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 10 C.F.R. § 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 10 C.F.R. § 431.323)~~.		
†† 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 section 431.324.		

(C) ~~Except as provided in subsection (D) of this section, m~~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)~~ **EXCEPTION to Sections 1605.1(n)(2)(B) and 1605.1(n)(2)(C).** The standards described in ~~sub~~sections 1605.1(n)(2)(B) and 1605.1(n)(2)(C) of this Article~~section~~ do not apply to metal halide lamp fixtures:~~–~~

(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.

(o) Dishwashers.

The maximum energy use and maximum water use of dishwashers that are consumer products manufactured on or after the effective dates shown shall meet the applicable values shown in Table O.

Table O
Standards for Dishwashers

Appliance	~~Effective January 1, 2010~~		Effective May 30, 2013	
	~~Maximum Energy Use (kWh/year)~~	~~Maximum Water Use (gallons/cycle)~~	Maximum Energy Use (kWh/year)	Maximum Water Use (gallons/cycle)
Compact dishwashers	~~260~~	~~4.5~~	222	3.5
Standard dishwashers	~~355~~	~~6.5~~	307	5.0

(p) Clothes Washers.

(1) **Standards for Residential Clothes Washers.** Clothes washers that are consumer products manufactured on or after the effective dates shown shall have an ~~The~~ integrated modified energy factor not less than, and an integrated water factor not greater ~~of clothes washers manufactured on or after the effective dates shown and that are consumer products shall be not less~~ than the applicable values shown in Table P-1 ~~and Table P-2~~.

~~**Table P-1**~~
~~**Standards for Residential Clothes Washers Manufactured On or After January 1, 2007 and Manufactured Before March 7, 2015**~~

~~Appliance~~	~~Minimum Modified Energy Factor Effective January 1, 2007~~	~~Maximum Water Factor Effective January 1, 2011~~
~~Top-loading compact clothes washers~~	~~0.65~~	~~--~~
~~Top-loading standard clothes washers~~	~~1.26~~	~~9.5~~
~~Top-loading, semi-automatic~~	~~N/A[1]~~	~~--~~
~~Front-loading clothes washers~~	~~1.26~~	~~9.5~~
~~Suds-saving~~	~~N/A[1]~~	~~--~~
~~[1] Must have an unheated rinse water option.~~		

Table P-~~2~~1
Standards for Residential Clothes Washers Manufactured On or After March 7, 2015

Appliance	Minimum Integrated Modified Energy Factor		Maximum Integrated Water Factor	
	March 7, 2015	January 1, 2018	March 7, 2015	January 1, 2018
Top-loading, Compact	0.86	1.15	14.4	12.0
Top-loading, Standard	1.29	1.57	8.4	6.5
Front-loading, Compact	1.13	1.13	8.3	8.3
Front-loading, Standard	1.84	1.84	4.7	4.7

(2) ~~**Energy Design Standard for Top-Loading Semi-Automatic Clothes Washers and Suds-Saving Clothes Washers.** Top-loading semi-automatic clothes washers that are consumer products and suds-saving clothes washers that are consumer products shall have an unheated rinse water option and do not need to meet the Modified Energy Factor standard shown in Table P-1.~~

~~(3)~~ **Commercial Clothes Washers.** Commercial clothes washers manufactured on or after the effective dates shown shall have a modified energy factor not less than, and a water factor not greater than, the applicable values shown in Table P-~~3~~2.

Table P-~~3~~2
Standards for Commercial Clothes Washers

Appliance	*Minimum Modified Energy Factor*	*Maximum Water Factor*
	Effective January 8, 2013	*Effective January 8, 2013*
Top-loading clothes washers	1.60	8.5
Front-loading clothes washers	2.00	5.5
	Modified Energy Factor (MEF) ~~Cu.ft.~~ft^3~~/~~kWh/cycle	*Integrated Water Factor (IWF) gal./ft^3 ~~cu./~~cycle*
	Effective January 1, 2018	*Effective January 1, 2018*
Top-loading clothes washers	1.35	8.8
Front-loading clothes washers	2.00	4.1

(q) Clothes Dryers.

~~(1) **Energy Efficiency Standards for Gas Clothes Dryers and Electric Clothes Dryers.** The energy factor of gas clothes dryers that are consumer products and electric clothes dryers that are consumer products, and that are manufactured on or after May 14, 1994, and manufactured before January 1, 2015 shall be not less than the applicable values shown in Table Q-1.~~

~~**Table Q-1**~~
~~**Standards for Clothes Dryers Manufactured On or After May 14, 1994 and Manufactured Before January 1, 2015**~~

~~*Appliance*~~	~~*Minimum Energy Factor (lbs/kWh)*~~
~~Electric, standard clothes dryers~~	~~3.01~~
~~Electric, compact, 120 volt clothes dryers~~	~~3.13~~
~~Electric, compact, 240 volt clothes dryers~~	~~2.90~~
~~Gas clothes dryers~~	~~2.67~~

~~(2)~~ **Energy Efficiency Standards for Vented Electric Clothes Dryers, Ventless Electric Clothes Dryers, and Vented Gas Clothes Dryers.** The combined energy factor of vented electric clothes dryers that are consumer products, ventless electric clothes dryers that are consumer products, and vented gas clothes dryers that are consumer products, and that are manufactured on or after January 1, 2015 shall be not less than the applicable values shown in Table Q-~~2~~.

Table Q-~~2~~
Standards for Vented Electric Clothes Dryers, Ventless Electric Clothes Dryers, and Vented Gas Clothes Dryers Manufactured On or After January 1, 2015

Appliance	*Minimum Combined Energy Factor (lbs/kWh)*	
	Vented	*Ventless*
Electric, standard clothes dryers	3.73	--
Electric, compact, 120 volt clothes dryers	3.61	--
Electric, compact, 240 volt clothes dryers	3.27	2.55
Electric, combination washer-dryer	--	2.08
Gas clothes dryers	3.30	--

(r) Cooking Products and Food Service Equipment.

(1) **Energy Design Standard for Gas Cooking Products.**

(A) **Gas Cooking Products Equipped with an Electrical Supply Cord.** Gas cooking products that are consumer products and that are equipped with an electrical supply cord shall not be equipped with a constant burning pilot light.

(B) **Gas Cooking Products Not Equipped with an Electrical Supply Cord.** Gas cooking products that are consumer products manufactured on or after April 9, 2012 and that are not equipped with an electrical supply cord shall not be equipped with a constant burning pilot light.

(2) **Microwave Ovens Manufactured On or After June 17, 2016.**

Microwave-only ovens, countertop convection microwave ovens, built-in microwave ovens, and over-the-range convection microwave ovens manufactured on or after June 17, 2016 shall not exceed the average standby power rating (watts) shown in Table R-2.

Table R-2
Standards for Microwave Ovens Manufactured On or After June 17, 2016

Appliance	*Maximum Standby Power (Watts)*
Microwave-only oven	1.0
Countertop convection microwave oven	1.0
Built-in microwave oven	2.2
Over-the-range convection microwave oven	2.2

(3) **Hot Food Holding Cabinets.** See ~~S~~section 1605.3(r) of this Article for energy efficiency standards for commercial hot food holding cabinets.

(4) **Other Cooking Products and Food Service Equipment.** There is no energy efficiency standard or energy design standard for other cooking products or for food service equipment.

(s) Electric Motors and Compressors.

(1) **Standards for Electric Motors.** The standards shown in Tables S-1, S-2, and S-3 of this Article apply only to electric motors, including partial electric motors that satisfy the following criteria:
(A) Are single-speed, induction motors;
(B) Are rated for continuous duty (MG 1) operation or for duty type S1 (IEC);
(C) Contain a squirrel-cage (MG 1) or cage (IEC) rotor;
(D) Operate on polyphase alternating current 60-hertz sinusoidal line power;
(E) Are rated 600 volts or less;
(F) Have a 2-, 4-, 6-, or 8-pole configuration,
(G) Are built in a three-digit or four-digit NEMA frame size (or IEC metric equivalent), including those designs between two consecutive NEMA frame sizes (or IEC metric equivalent), or an enclosed 56 NEMA frame size (or IEC metric equivalent),
(H) Produce at least one horsepower (0.746 kW) but not greater than 500 horsepower (373 kW), and
(I) Meet all of the performance requirements of one of the following motor types: A NEMA Design A, B, or C motor or an IEC Design N or H motor.

~~(A) **Electric Motors.** Except as provided in Sections 1605.1(s)(1)(B), 1605.1(s)(2), 1605.1(s)(3), 1605.1(s)(4), and 1605.1(s)(5) of this Article, the nominal full-load efficiency of all electric motors manufactured (alone or as a component of another piece of equipment) after October 24, 1997, or in the case of an electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after October 24, 1999, and that are federally-regulated commercial and industrial equipment shall be not less than the applicable values shown in Table S-1.~~

~~**Table S-1**~~
~~**Standards for Electric Motors**~~

Motor Horsepower/ Standard Kilowatt Equivalent	Minimum Nominal Full-Load Efficiency					
	Open Motors			Enclosed Motors		
	6 poles	4 poles	2 poles	6 poles	4 poles	2 poles
1/0.75	80.0	82.5	. . .	80.0	82.5	75.5
1.5/1.1	84.0	84.0	82.5	85.5	84.0	82.5
2/1.5	85.5	84.0	84.0	86.5	84.0	84.0
3/2.2	86.5	86.5	84.0	87.5	87.5	85.5
5/3.7	87.5	87.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	87.5	89.5	89.5	88.5
10/7.5	90.2	89.5	88.5	89.5	89.5	89.5
15/11	90.2	91.0	89.5	90.2	91.0	90.2
20/15	91.0	91.0	90.2	90.2	91.0	90.2
25/18.5	91.7	91.7	91.0	91.7	92.4	91.0
30/22	92.4	92.4	91.0	91.7	92.4	91.0
40/30	93.0	93.0	91.7	93.0	93.0	91.7
50/37	93.0	93.0	92.4	93.0	93.0	92.4
60/45	93.6	93.6	93.0	93.6	93.6	93.0
75/55	93.6	94.1	93.0	93.6	94.1	93.0
100/75	94.1	94.1	93.0	94.1	94.5	93.6
125/90	94.1	94.5	93.6	94.1	94.5	94.5
150/110	94.5	95.0	93.6	95.0	95.0	94.5
200/150	94.5	95.0	94.5	95.0	95.0	95.0

(B) **Small Electric Motors.** The average full load efficiency of each small open electric motor manufactured (alone or as a component of another piece of non-covered equipment) after March 9, 2015, or in the case of a small electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after March 9, 2017, shall be not less than the values shown in Table S-2:

Table S-2
Standards for Small Electric Motors

Motor Horsepower/ Standard Kilowatt Equivalent	Minimum Average Full-Load Efficiency					
	Polyphase			Capacitor-start capacitor-run and capacitor-start induction-run Motors		
	6 poles	4 poles	2 poles	6 poles	4 poles	2 poles
0.25/0.18	67.5	69.5	65.6	62.2	68.5	66.6
0.33/0.25	71.4	73.4	69.5	66.6	72.4	70.5
0.5/0.37	75.3	78.2	73.4	76.2	76.2	72.4
0.75/0.55	81.7	81.1	76.8	80.2	81.8	76.2
1.0/0.75	82.5	83.5	77.0	81.1	82.6	80.4
1.5/1.1	83.8	86.5	84.0	. . .	83.8	81.5
2.0/1.5	. . .	86.5	85.5	. . .	84.5	82.9
3.0/2.2	. . .	86.9	85.5	. . .	. . .	84.1

(C) For purposes of determining the required minimum nominal full load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepowers or kilowattages shown in Table S-1, or of determining the required minimum average full load efficiency of a small electric motor that has a horsepower or kilowatt rating between two horsepowers or kilowattages shown in Table S-2, each such motor shall be deemed to have a horsepower or kilowatt rating that is listed in Table S-1 or Table S-2, as applicable. The rating that the motor is deemed to have shall be determined as follows:

~~1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers;~~
~~2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers; or~~
~~3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula, 1 kilowatt = (1/0.746) horsepower, without calculating beyond three significant decimal places, and the resulting horsepower shall be rounded in accordance with Sections 1605.1(s)(1)(A)1. or 1605.1(s)(1)(A)2., whichever applies.~~

(2) **NEMA Design A Motors, NEMA Design B Motors, and IEC Design N Motors.** Starting on June 1, 2016, each NEMA Design A motor, NEMA Design B motor, and IEC Design N motor that is an electric motor meeting the criteria in section 1605.1(s)(1) of this Article and with a power rating from 1 horsepower through 500 horsepower, but excluding fire pump electric motors, manufactured (alone or as a component of another piece of equipment) shall have a nominal full-load efficiency of not less than the values shown in Table S-1:

Table S-1
Minimum Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B and IEC Design N Motors (Excluding Fire Pump Electric Motors) at 60 Hz

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20/15	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25/18.5	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30/22	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40/30	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50/37	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60/45	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75/55	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100/75	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
125/90	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
150/110	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
200/150	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
250/186	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
300/224	95.8	95.4	96.2	95.8	95.8	95.8		
350/261	95.8	95.4	96.2	95.8	95.8	95.8		
400/298	95.8	95.8	96.2	95.8				
450/336	95.8	96.2	96.2	96.2				
500/373	95.8	96.2	96.2	96.2				

(3) **NEMA Design C motors and IEC Design H motors.** Starting on June 1, 2016, each NEMA Design C motor and IEC Design H motor that is an electric motor meeting the criteria in section 1605.1(s)(1) of this Article and with a power rating from 1 horsepower through 200 horsepower manufactured (alone or as a

component of another piece of equipment) shall have a nominal full-load efficiency that is not less than the values shown in Table S-2:

Table S-2
Minimum Nominal Full-Load Efficiencies of NEMA Design C and IEC Design H Motors at 60 Hz

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency (%)					
	4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	85.5	85.5	82.5	82.5	75.5	75.5
1.5/1.1	86.5	86.5	87.5	86.5	78.5	77.0
2/1.5	86.5	86.5	88.5	87.5	84.0	86.5
3/2.2	89.5	89.5	89.5	88.5	85.5	87.5
5/3.7	89.5	89.5	89.5	89.5	86.5	88.5
7.5/5.5	91.7	91.0	91.0	90.2	86.5	89.5
10/7.5	91.7	91.7	91.0	91.7	89.5	90.2
15/11	92.4	93.0	91.7	91.7	89.5	90.2
20/15	93.0	93.0	91.7	92.4	90.2	91.0
25/18.5	93.6	93.6	93.0	93.0	90.2	91.0
30/22	93.6	94.1	93.0	93.6	91.7	91.7
40/30	94.1	94.1	94.1	94.1	91.7	91.7
50/37	94.5	94.5	94.1	94.1	92.4	92.4
60/45	95.0	95.0	94.5	94.5	92.4	93.0
75/55	95.4	95.0	94.5	94.5	93.6	94.1
100/75	95.4	95.4	95.0	95.0	93.6	94.1
125/90	95.4	95.4	95.0	95.0	94.1	94.1
150/110	95.8	95.8	95.8	95.4	94.1	94.1
200/150	96.2	95.8	95.8	95.4	94.5	94.1

(4) **Fire Pump Electric Motors.** Starting on June 1, 2016, each fire pump electric motor meeting the criteria in section 1605.1(s)(1) of this Article and with a power rating of 1 horsepower through 500 horsepower, manufactured (alone or as a component of another piece of equipment) shall have a nominal full-load efficiency that is not less than the values shown in Table S-3

Table S-3
Minimum Nominal Full-Load Efficiencies of Fire Pump Electric Motors at 60 Hz

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency (%)							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1/.75	75.5		82.5	82.5	80.0	80.0	74.0	74.0
1.5/1.1	82.5	82.5	84.0	84.0	85.5	84.0	77.0	75.5
2/1.5	84.0	84.0	84.0	84.0	86.5	85.5	82.5	85.5
3/2.2	85.5	84.0	87.5	86.5	87.5	86.5	84.0	86.5
5/3.7	87.5	85.5	87.5	87.5	87.5	87.5	85.5	87.5
7.5/5.5	88.5	87.5	89.5	88.5	89.5	88.5	85.5	88.5
10/7.5	89.5	88.5	89.5	89.5	89.5	90.2	88.5	89.5
15/11	90.2	89.5	91.0	91.0	90.2	90.2	88.5	89.5
20/15	90.2	90.2	91.0	91.0	90.2	91.0	89.5	90.2
25/18.5	91.0	91.0	92.4	91.7	91.7	91.7	89.5	90.2
30/22	91.0	91.0	92.4	92.4	91.7	92.4	91.0	91.0
40/30	91.7	91.7	93.0	93.0	93.0	93.0	91.0	91.0
50/37	92.4	92.4	93.0	93.0	93.0	93.0	91.7	91.7
60/45	93.0	93.0	93.6	93.6	93.6	93.6	91.7	92.4
75/55	93.0	93.0	94.1	94.1	93.6	93.6	93.0	93.6
100/75	93.6	93.0	94.5	94.1	94.1	94.1	93.0	93.6
125/90	94.5	93.6	94.5	94.5	94.1	94.1	93.6	93.6
150/110	94.5	93.6	95.0	95.0	95.0	94.5	93.6	93.6
200/150	95.0	94.5	95.0	95.0	95.0	94.5	94.1	93.6
250/186	95.4	94.5	95.0	95.4	95.0	95.4	94.5	94.5
300/224	95.4	95.0	95.4	95.4	95.0	95.4		
350/261	95.4	95.0	95.4	95.4	95.0	95.4		
400/298	95.4	95.4	95.4	95.4				
450/336	95.4	95.8	95.4	95.8				
500/373	95.4	95.8	95.8	95.8				

EXCEPTIONS to Sections 1605.1(s)(2), 1605.1(s)(3), and 1605.1(s)(4). The standards in Tables S-1, S-2 or S-3 of this Article do not apply to the following electric motors exempted by the Secretary, or any additional electric motors that the Secretary may exempt:
(A) Air-over electric motors;
(B) Component sets of an electric motor;
(C) Liquid-cooled electric motors;
(D) Submersible electric motors; and
(E) Inverter-only electric motors.

(5) **Small Electric Motors.** The average full load efficiency of each small open electric motor manufactured (alone or as a component of another piece of non-covered equipment) after March 9, 2015, or in the case of a small electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after March 9, 2017, shall be not less than the values shown in Table S-4:

Table S-4
Standards for Small Electric Motors

Motor Horsepower/ Standard Kilowatt Equivalent	*Minimum Average Full-Load Efficiency*					
	Polyphase			*Capacitor-start capacitor-run and capacitor-start induction-run Motors*		
	6 poles	*4 poles*	*2 poles*	*6 poles*	*4 poles*	*2 poles*
0.25/0.18	67.5	69.5	65.6	62.2	68.5	66.6
0.33/0.25	71.4	73.4	69.5	66.6	72.4	70.5
0.5/0.37	75.3	78.2	73.4	76.2	76.2	72.4
0.75/0.55	81.7	81.1	76.8	80.2	81.8	76.2
1.0/0.75	82.5	83.5	77.0	81.1	82.6	80.4
1.5/1.1	83.8	86.5	84.0	. . .	83.8	81.5
2.0/1.5	. . .	86.5	85.5	. . .	84.5	82.9
3.0/2.2	. . .	86.9	85.5	. . .	. . .	84.1

(6) **Determinations of Efficiency.** For purposes of determining the required minimum nominal full load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings shown in Tables S-1, S-2, or S-3, or of determining the required minimum average full load efficiency of a small electric motor that has a horsepower or kilowatt rating between two horsepower or kilowatt ratings shown in Table S-4, each such motor shall be deemed to have a listed horsepower or kilowatt rating determined as follows:

(A) A horsepower at or above the midpoint between the two consecutive horsepower ratings shall be rounded up to the higher of the two horsepower ratings;
(B) A horsepower below the midpoint between the two consecutive horsepower ratings shall be rounded down to the lower of the two horsepower ratings; or
(C) A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula, 1 kilowatt = (1/0.746) horsepower, without calculating beyond three significant decimal places, and the resulting horsepower shall be rounded in accordance with sections 1605.1(s)(6)(A) or 1605.1(s)(6)(B) of this Article, whichever applies.

(7) **Compressors.** There are no standards for federally regulated compressors.

~~(2) **General Purpose Electric Motors (Subtype I Except Fire Pump Motors).** The nominal full-load efficiency of all general purpose electric motors (Subtype I, except fire pump motors) manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall be not less than the applicable values shown in Table S-3.~~

~~**Table S-3**~~
~~**Standards for Subtype I General Purpose Electric Motors (EXCEPT Fire Pump Motors) Manufactured on or After December 19, 2010**~~

~~*Motor Horsepower*~~	~~*Minimum Nominal Full-Load Efficiency*~~					
	~~*Open Motors*~~			~~*Enclosed Motors*~~		
	~~*6 poles*~~	~~*4 poles*~~	~~*2 poles*~~	~~*6 poles*~~	~~*4 poles*~~	~~*2 poles*~~
~~1~~	~~82.5~~	~~85.5~~	~~77.0~~	~~82.5~~	~~85.5~~	~~77.0~~
~~1.5~~	~~86.5~~	~~86.5~~	~~84.0~~	~~87.5~~	~~86.5~~	~~84.0~~
~~2~~	~~87.5~~	~~86.5~~	~~85.5~~	~~88.5~~	~~86.5~~	~~85.5~~
~~3~~	~~88.5~~	~~89.5~~	~~85.5~~	~~89.5~~	~~89.5~~	~~86.5~~
~~5~~	~~89.5~~	~~89.5~~	~~86.5~~	~~89.5~~	~~89.5~~	~~88.5~~
~~7.5~~	~~90.2~~	~~91.0~~	~~88.5~~	~~91.0~~	~~91.7~~	~~89.5~~
~~10~~	~~91.7~~	~~91.7~~	~~89.5~~	~~91.0~~	~~91.7~~	~~90.2~~
~~15~~	~~91.7~~	~~93.0~~	~~90.2~~	~~91.7~~	~~92.4~~	~~91.0~~

20	92.4	93.0	91.0	91.7	93.0	91.0
25	93.0	93.6	91.7	93.0	93.6	91.7
30	93.6	94.1	91.7	93.0	93.6	91.7
40	94.1	94.1	92.4	94.1	94.1	92.4
50	94.1	94.5	93.0	94.1	94.5	93.0
60	94.5	95.0	93.6	94.5	95.0	93.6
75	94.5	95.0	93.6	94.5	95.4	93.6
100	95.0	95.4	93.6	95.0	95.4	94.1
125	95.0	95.4	94.1	95.0	95.4	95.0
150	95.4	95.8	94.1	95.8	95.8	95.0
200	95.4	95.8	95.0	95.8	96.2	95.4

(3) **Fire Pump Electric Motors.** The nominal full-load efficiency of all fire pump electric motors manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall be not less than the applicable values shown in Table S-4.

Table S-4
Standards for Fire Pump Electric Motors
Manufactured On or After December 19, 2010

Motor Horsepower	*Minimum Nominal Full Load Efficiency*							
	Open Motors				*Enclosed Motors*			
	8 poles	*6 poles*	*4 poles*	*2 poles*	*8 poles*	*6 poles*	*4 poles*	*2 poles*
1	74.0	80.0	82.5	. . .	74.0	80.0	82.5	75.5
1.5	75.5	84.0	84.0	82.5	77.0	85.5	84.0	82.5
2	85.5	85.5	84.0	84.0	82.5	86.5	84.0	84.0
3	86.5	86.5	86.5	84.0	84.0	87.5	87.5	85.5
5	87.5	87.5	87.5	85.5	85.5	87.5	87.5	87.5
7.5	88.5	88.5	88.5	87.5	85.5	89.5	89.5	88.5
10	89.5	90.2	89.5	88.5	88.5	89.5	89.5	89.5
15	89.5	90.2	91.0	89.5	88.5	90.2	91.0	90.2
20	90.2	91.0	91.0	90.2	89.5	90.2	91.0	90.2
25	90.2	91.7	91.7	91.0	89.5	91.7	92.4	91.0
30	91.0	92.4	92.4	91.0	91.0	91.7	92.4	91.0
40	91.0	93.0	93.0	91.7	91.0	93.0	93.0	91.7
50	91.7	93.0	93.0	92.4	91.7	93.0	93.0	92.4
60	92.4	93.6	93.6	93.0	91.7	93.6	93.6	93.0
75	93.6	93.6	94.1	93.0	93.0	93.6	94.1	93.0
100	93.6	94.1	94.1	93.0	93.0	94.1	94.5	93.6
125	93.6	94.1	94.5	93.6	93.6	94.1	94.5	94.5
150	93.6	94.5	95.0	93.6	93.6	95.0	95.0	94.5
200	93.6	94.5	95.0	94.5	94.1	95.0	95.0	95.0
250	94.5	95.4	95.4	94.5	94.5	95.0	95.0	95.4
300	. . .	95.4	95.4	95.0	. . .	95.0	95.4	95.4
350	. . .	95.4	95.4	95.0	. . .	95.0	95.4	95.4
400	. . .	. . .	95.4	95.4	. . .	. . .	95.4	95.4
450	. . .	. . .	95.8	95.8	. . .	. . .	95.4	95.4
500	. . .	. . .	95.8	95.8	. . .	. . .	95.8	95.4

(4) **General Purpose Electric Motors, Subtype II.** The nominal full-load efficiency of all general purpose electric motors (Subtype II) manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall be not less than the applicable values shown in Table S-5.

~~Table S-5~~
~~Standards for General Purpose Electric Motors (Subtype II)~~
~~Manufactured On or After December 19, 2010~~

~~Motor Horsepower~~	~~Minimum Nominal Full-Load Efficiency~~							
	~~Open Motors~~				~~Enclosed Motors~~			
	~~8 poles~~	~~6 poles~~	~~4 poles~~	~~2 poles~~	~~8 poles~~	~~6 poles~~	~~4 poles~~	~~2 poles~~
~~1~~	~~74.0~~	~~80.0~~	~~82.5~~	~~. . .~~	~~74.0~~	~~80.0~~	~~82.5~~	~~75.5~~
~~1.5~~	~~75.5~~	~~84.0~~	~~84.0~~	~~82.5~~	~~77.0~~	~~85.5~~	~~84.0~~	~~82.5~~
~~2~~	~~85.5~~	~~85.5~~	~~84.0~~	~~84.0~~	~~82.5~~	~~86.5~~	~~84.0~~	~~84.0~~
~~3~~	~~86.5~~	~~86.5~~	~~86.5~~	~~84.0~~	~~84.0~~	~~87.5~~	~~87.5~~	~~85.5~~
~~5~~	~~87.5~~	~~87.5~~	~~87.5~~	~~85.5~~	~~85.5~~	~~87.5~~	~~87.5~~	~~87.5~~
~~7.5~~	~~88.5~~	~~88.5~~	~~88.5~~	~~87.5~~	~~85.5~~	~~89.5~~	~~89.5~~	~~88.5~~
~~10~~	~~89.5~~	~~90.2~~	~~89.5~~	~~88.5~~	~~88.5~~	~~89.5~~	~~89.5~~	~~89.5~~
~~15~~	~~89.5~~	~~90.2~~	~~91.0~~	~~89.5~~	~~88.5~~	~~90.2~~	~~91.0~~	~~90.2~~
~~20~~	~~90.2~~	~~91.0~~	~~91.0~~	~~90.2~~	~~89.5~~	~~90.2~~	~~91.0~~	~~90.2~~
~~25~~	~~90.2~~	~~91.7~~	~~91.7~~	~~91.0~~	~~89.5~~	~~91.7~~	~~92.4~~	~~91.0~~
~~30~~	~~91.0~~	~~92.4~~	~~92.4~~	~~91.0~~	~~91.0~~	~~91.7~~	~~92.4~~	~~91.0~~
~~40~~	~~91.0~~	~~93.0~~	~~93.0~~	~~91.7~~	~~91.0~~	~~93.0~~	~~93.0~~	~~91.7~~
~~50~~	~~91.7~~	~~93.0~~	~~93.0~~	~~92.4~~	~~91.7~~	~~93.0~~	~~93.0~~	~~92.4~~
~~60~~	~~92.4~~	~~93.6~~	~~93.6~~	~~93.0~~	~~91.7~~	~~93.6~~	~~93.6~~	~~93.0~~
~~75~~	~~93.6~~	~~93.6~~	~~94.1~~	~~93.0~~	~~93.0~~	~~93.6~~	~~94.1~~	~~93.0~~
~~100~~	~~93.6~~	~~94.1~~	~~94.1~~	~~93.0~~	~~93.0~~	~~94.1~~	~~94.5~~	~~93.6~~
~~125~~	~~93.6~~	~~94.1~~	~~94.5~~	~~93.6~~	~~93.6~~	~~94.1~~	~~94.5~~	~~94.5~~
~~150~~	~~93.6~~	~~94.5~~	~~95.0~~	~~93.6~~	~~93.6~~	~~95.0~~	~~95.0~~	~~94.5~~
~~200~~	~~93.6~~	~~94.5~~	~~95.0~~	~~94.5~~	~~94.1~~	~~95.0~~	~~95.0~~	~~95.0~~

~~(5) **NEMA Design B Electric Motors.** The nominal full-load efficiency of all NEMA Design B general purpose electric motors manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall be not less than the applicable values shown in Table S-6.~~

~~Table S-6~~
~~Standards for NEMA Design B Electric Motors~~
~~Manufactured On or After December 19, 2010~~

~~Motor Horsepower~~	~~Minimum Nominal Full-Load Efficiency~~							
	~~Open Motors~~				~~Enclosed Motors~~			
	~~8 poles~~	~~6 poles~~	~~4 poles~~	~~2 poles~~	~~8 poles~~	~~6 poles~~	~~4 poles~~	~~2 poles~~
~~250~~	~~94.5~~	~~95.4~~	~~95.4~~	~~94.5~~	~~94.5~~	~~95.0~~	~~95.0~~	~~95.4~~
~~300~~	~~. . .~~	~~95.4~~	~~95.4~~	~~95.0~~	~~. . .~~	~~95.0~~	~~95.4~~	~~95.4~~
~~350~~	~~. . .~~	~~95.4~~	~~95.4~~	~~95.0~~	~~. . .~~	~~95.0~~	~~95.4~~	~~95.4~~
~~400~~	~~. . .~~	~~. . .~~	~~95.4~~	~~95.4~~	~~. . .~~	~~. . .~~	~~95.4~~	~~95.4~~
~~450~~	~~. . .~~	~~. . .~~	~~95.8~~	~~95.8~~	~~. . .~~	~~. . .~~	~~95.4~~	~~95.4~~
~~500~~	~~. . .~~	~~. . .~~	~~95.8~~	~~95.8~~	~~. . .~~	~~. . .~~	~~95.8~~	~~95.4~~

(t) Distribution Transformers.

(1) **Low-Voltage Dry-Type Distribution Transformers.** The efficiency of a low-voltage dry-type distribution transformer manufactured on or after January 1, 2016~~the effective dates shown,~~ shall be not less than that required for their kVA rating as shown in Table T-3. Low-voltage dry-type distribution transformers with kVA ratings not appearing in Table T-3 shall have their minimum efficiency determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

Table T-3
Standards for Low-Voltage Dry-Type Distribution Transformers

Single phase			Three phase		
kVa	Efficiency (%)[1]		kVa	Efficiency (%)[1]	
	~~Effective January 1, 2007~~	~~Effective January 1, 2016~~		~~Effective January 1, 2007~~	~~Effective January 1, 2016~~
15	~~97.7~~	97.70	15	~~97.0~~	97.89
25	~~98.0~~	98.00	30	~~97.5~~	98.23
37.5	~~98.2~~	98.20	45	~~97.7~~	98.40
50	~~98.3~~	98.30	75	~~98.0~~	98.60
75	~~98.5~~	98.50	112.5	~~98.2~~	98.74
100	~~98.6~~	98.60	150	~~98.3~~	98.83
167	~~98.7~~	98.70	225	~~98.5~~	98.94
250	~~98.8~~	98.80	300	~~98.6~~	99.02
333	~~98.9~~	98.90	500	~~98.7~~	99.14
			750	~~98.8~~	99.23
			1000	~~98.9~~	99.28

[1] All efficiency values are at 35 percent of nameplate-rated load, determined according to the DOE Test Method for Measuring the Energy Consumption of Distribution Transformers under Appendix A to subpart K of 10 C.F.R. part 431. ~~Efficiencies are determined at the following reference conditions: (1) for no-load losses, at the temperature of 20°C, and (2) for load-losses, at the temperature of 75°C and 35 percent of nameplate load. (Source: Table 4–2 of NEMA Standard TP–1–2002, "Guide for Determining Energy Efficiency for Distribution Transformers.")~~

(2) **Liquid-Immersed Distribution Transformers.** The efficiency of a liquid- immersed distribution transformer manufactured on or after January 1, 2016~~the effective dates shown,~~ shall be no less than that required for their kVA rating as shown in Table T-4. Liquid-immersed distribution transformers with kVA ratings not appearing in Table T-4 shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

Table T-4
Standards for Liquid-Immersed Distribution Transformers

Single phase			Three phase		
kVa	Efficiency (%)[1]		kVa	Efficiency (%)[1]	
	~~Effective January 1, 2007~~	~~Effective January 1, 2016~~		~~Effective January 1, 2007~~	~~Effective January 1, 2016~~
10	~~98.62~~	98.70	15	~~98.36~~	98.65
15	~~98.76~~	98.82	30	~~98.62~~	98.83
25	~~98.91~~	98.95	45	~~98.76~~	98.92
37.5	~~99.01~~	99.05	75	~~98.91~~	99.03
50	~~99.08~~	99.11	112.5	~~99.01~~	99.11
75	~~99.17~~	99.19	150	~~99.08~~	99.16
100	~~99.23~~	99.25	225	~~99.17~~	99.23
167	~~99.25~~	99.33	300	~~99.23~~	99.27
250	~~99.32~~	99.39	500	~~99.25~~	99.35
333	~~99.36~~	99.43	750	~~99.32~~	99.40

500	~~99.42~~	99.49	1000	~~99.36~~	99.43
667	~~99.46~~	99.52	1500	~~99.42~~	99.48
833	~~99.49~~	99.55	2000	~~99.46~~	99.51
			2500	~~99.49~~	99.53

[1] Note: All efficiency values are at 50 percent of nameplate-rated load, determined according to the DOE Test Method for Measuring the Energy Consumption of Distribution Transformers under Appendix A to subpart K of 10 CFR part 431.~~when tested according to the test procedure in Section 1604(t).~~

(3) **Medium-Voltage Dry-Type Distribution Transformers.** The efficiency of a medium-voltage dry-type distribution transformer manufactured on or after January 1, ~~2010~~2016, shall be no less than that required for their kVA and BIL rating in Table T-5. Medium-voltage dry-type distribution transformers with kVA ratings not appearing in Table T-5 shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

~~**Table T-5**~~
~~**Standards for Medium-Voltage Dry-Type Distribution Transformers**~~
~~**Manufactured On or After January 1, 2010 and Prior to January 1, 2016**~~

~~*Single phase*~~				~~*Three phase*~~			
~~*BIL kVA*~~	~~*20-45 kV Efficiency[1] (%)*~~	~~*46-95 kV efficiency[1] (%)*~~	~~*≥ 96 kV efficiency[1] (%)*~~	~~*BIL kVA*~~	~~*20-45 kV Efficiency[1] (%)*~~	~~*46-95 kV efficiency[1] (%)*~~	~~*≥ 96 kV efficiency[1] (%)*~~
~~15~~	~~98.10~~	~~97.86~~		~~15~~	~~97.50~~	~~97.18~~	
~~25~~	~~98.33~~	~~98.12~~		~~30~~	~~97.90~~	~~97.63~~	
~~37.5~~	~~98.49~~	~~98.30~~		~~45~~	~~98.10~~	~~97.86~~	
~~50~~	~~98.60~~	~~98.42~~		~~75~~	~~98.33~~	~~98.12~~	
~~75~~	~~98.73~~	~~98.57~~	~~98.53~~	~~112.5~~	~~98.49~~	~~98.30~~	
~~100~~	~~98.82~~	~~98.67~~	~~98.63~~	~~150~~	~~98.60~~	~~98.42~~	
~~167~~	~~98.96~~	~~98.83~~	~~98.80~~	~~225~~	~~98.73~~	~~98.57~~	~~98.53~~
~~250~~	~~99.07~~	~~98.95~~	~~98.91~~	~~300~~	~~98.82~~	~~98.67~~	~~98.63~~
~~333~~	~~99.14~~	~~99.03~~	~~98.99~~	~~500~~	~~98.96~~	~~98.83~~	~~98.80~~
~~500~~	~~99.22~~	~~99.12~~	~~99.09~~	~~750~~	~~99.07~~	~~98.95~~	~~98.91~~
~~667~~	~~99.27~~	~~99.18~~	~~99.15~~	~~1000~~	~~99.14~~	~~99.03~~	~~98.99~~
~~833~~	~~99.31~~	~~99.23~~	~~99.20~~	~~1500~~	~~99.22~~	~~99.12~~	~~99.09~~
				~~2000~~	~~99.27~~	~~99.18~~	~~99.15~~
				~~2500~~	~~99.31~~	~~99.23~~	~~99.20~~

~~[1] All efficiency values are at 50 percent of nameplate rated load, determined when tested according to the test procedure in Section 1604(t).~~

Table T-5~~6~~
Standards for Medium-Voltage Dry-Type Distribution Transformers
Manufactured On or After January 1, 2016

Single phase				Three phase			
	BIL				BIL		
kVA	20-45 kV Efficiency[1] (%)	46-95 kV efficiency[1] (%)	≥ 96 kV efficiency[1] (%)	BIL kVA	20-45 kV Efficiency[1] (%)	46-95 kV efficiency[1] (%)	≥ 96 kV efficiency[1] (%)
15	98.10	97.86		15	97.50	97.18	
25	98.33	98.12		30	97.90	97.63	
37.5	98.49	98.30		45	98.10	97.86	
50	98.60	98.42		75	98.33	98.13	
75	98.73	98.57	98.53	112.5	98.52	98.36	
100	98.82	98.67	98.63	150	98.65	98.51	
167	98.96	98.83	98.80	225	98.82	98.69	98.57
250	99.07	98.95	98.91	300	98.93	98.81	98.69
333	99.14	99.03	98.99	500	99.09	98.99	98.89
500	99.22	99.12	99.09	750	99.21	99.12	99.02
667	99.27	99.18	99.15	1000	99.28	99.20	99.11
833	99.31	99.23	99.20	1500	99.37	99.30	99.21
				2000	99.43	99.36	99.28
				2500	99.47	99.41	99.33

[1]~~All efficiency values are at 50 percent of nameplate rated load, determined when tested according to the test procedure in Section 1604(t).~~All efficiency values are at 50 percent of nameplate rated load, determined according to the DOE Test Method for Measuring the Energy Consumption of Distribution Transformers under Appendix A to subpart K of 10 CFR part 431.

(u) External Power Supplies.

~~(1) The energy factor for Class A external power supplies that are federally regulated and manufactured on or after July 1, 2008, shall be not less than the applicable values shown in Table U-1, except that:~~

~~(A) The standards in Table U-1 shall not apply to a Class A external power supply that is:~~

~~1. manufactured between July 1, 2008 and June 30, 2015; and~~

~~2. made available by the manufacturer as a service part or spare part for an end-use product that (i) constitutes the primary load; and (ii) was manufactured before July 1, 2008.~~

~~(B) The no-load mode energy efficiency standards in Table U-1 of this section shall not apply to an external power supply manufactured before July 1, 2017, that:~~

~~1. is an AC-to-AC external power supply;~~

~~2. has a nameplate output of 20 watts or more;~~

~~3. is certified to the Secretary as being designed to be connected to a security or life safety alarm or surveillance system component; and~~

~~4. on establishment within the External Power Supply International Efficiency Marking Protocol, as referenced in the "Energy Star Program Requirements for Single Voltage External Ac-Dc and Ac-Ac Power Supplies" (see 10 C.F.R. section 430.3), published by the Environmental Protection Agency, of a distinguishing mark for products described in this clause, is permanently marked with the distinguishing mark.~~

~~(C) An energy efficiency standard for external power supplies shall not constitute an energy efficiency standard for the separate end-use product to which the external power supply is connected.~~

~~**Table U-1**~~
~~**Standards for Class A External Power Supplies That are Federally Regulated**~~

~~***Nameplate Output***~~	~~***Minimum Efficiency in Active Mode (Decimal equivalent of a Percentage)***~~
~~< 1 watt~~	~~0.5 * Nameplate Output~~
~~≥ 1 and ≤ 51 watts~~	~~0.09*Ln(Nameplate Output) + 0.5~~
~~> 51 watts~~	~~0.85~~
	~~***Maximum Energy Consumption in No-Load Mode***~~
~~≤ 250 watts~~	~~0.5 watts~~
~~Where Ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.~~	

~~(2) See Section 1605.3(u) for energy efficiency standards for state-regulated external power supplies.~~

~~(D) Direct operation external power supplies manufactured on or after February 10, 2016 shall meet the standards in Table U-2 with the exception of those described in subpart 1 and 2 of this section.~~

(1) **Class A External Power Supplies.** Except as provided in subsections 1605.1(u)(4) and 1605.1(u)(7) of this Article, all Class A external power supplies manufactured on or after July 1, 2008, shall meet the standards shown in Table U-1:

Table U-1
Standards for Class A External Power Supplies

Active Mode	
Nameplate Output	***Required efficiency (decimal equivalent of a percentage)***
Less than 1 watt	0.5 times the Nameplate output
From 1 watt to not more than 51 watts	The sum of 0.09 times the Natural Logarithm of the Nameplate Output and 0.5
Greater than 51 watts	0.85
Not more than 250 watts	0.5

(2) **Direct Operation External Power Supplies.** Except as provided in subsections 1605.1(u)(7) and 1605.1(u)(8) of this Article, all direct operation external power supplies manufactured on or after February 10, 2016, shall meet the standards shown in Table U-2:

Table U-2
Standards for Direct Operation External Power Supplies

Power Supply Type	*Nameplate Output Power (P_{out})*	*Minimum Average Efficiency in Active Mode*[*]	*Maximum Power in No Load Mode [W]*
Single Voltage External AC-DC Power Supply, Basic Voltage	$P_{out} \leq 1$ W	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.100
	1 W ≤ P_{out} ≤ 49 W	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.100
	49 W ≤ P_{out} ≤ 250 W	≥ 0.880	≤ 0.210
	P_{out} > 250 W	≥ 0.875	≤ 0.500
Single Voltage External AC-DC Power Supply, Low Voltage	$P_{out} \leq 1$ W	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.100
	1 W ≤ P_{out} ≤ 49 W	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.100
	49 W ≤ P_{out} ≤ 250 W	≥ 0.870	≤ 0.210
	P_{out} > 250 W	≥ 0.875	≤ 0.500
Single Voltage External AC-AC Power Supply, Basic Voltage	$P_{out} \leq 1$ W	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.210
	1 W ≤ P_{out} ≤ 49 W	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.210
	49 W ≤ P_{out} ≤ 250 W	≥ 0.880	≤ 0.210
	P_{out} > 250 W	≥ 0.875	≤ 0.500
Single Voltage External AC-AC Power Supply, Low Voltage	$P_{out} \leq 1$ W	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.210
	1 W ≤ P_{out} ≤ 49 W	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.210
	49 W ≤ P_{out} ≤ 250 W	≥ 0.870	≤ 0.210
	P_{out} > 250 W	≥ 0.875	≤ 0.500
Multiple Voltage External Power Supply	$P_{out} \leq 1$ W	$\geq 0.497 \times P_{out} + 0.067$	≤ 0.300
	1 W ≤ P_{out} ≤ 49 W	$\geq 0.075 \times \ln(P_{out}) + 0.561$	≤ 0.300
	P_{out} > 49 W	≥ 0.860	≤ 0.300

[*] Expressed as a decimal.

(3) **All External Power Supplies Manufactured On or After February 10, 2016.** Except as provided in subsections 1605.1(u)(7) and 1605.1(u)(8) of this Article, all direct operation external power supplies manufactured on or after February 10, 2016, shall meet the standards shown in Table U-3:

Table U-3
Standards for All External Power Supplies
Manufactured On or After February 10, 2016

Operation EPS Type	*Class A EPS*	*Non-Class A EPS*
Direct Operation EPS	Level VI: 10 C.F.R. 430.32 (w)(1)(ii)	Level VI 10 C.F.R. 430.32(w)(1)(ii)
Indirect Operation EPS	Level VI: 10 C.F.R. 430.32 (w)(1)(i)	No standards

(4) **Exclusions.** A basic model of external power supply is not subject to the energy conservation standards of section 1605.1(u)(2) of this Article if the external power supply:
- (A) Is manufactured during the period beginning on February 10, 2016, and ending on February 10, 2020;
- (B) Is marked in accordance with the External Power Supply International Efficiency Marking Protocol, as in effect on February 10, 2016;
- (C) Meets, where applicable, the standards under section 1605.1(u)(1) of this Article, and has been certified to the Secretary as meeting those standards; and
- (D) Is made available by the manufacturer only as a service part or a spare part for an end-use product that:
  1. constitutes the primary load; and
  2. was manufactured before February 10, 2016.

(5) **End Use Product Exclusion.** The standards described in sections 1605.1(u)(1), 1605.1(u)(2), and 1605.1(u)(3) of this Article shall not constitute an energy conservation standard for the separate end-use product to which the external power supply is connected.

(6) **Non-application of no-load mode requirements.** The no-load mode energy efficiency standards established in sections 1605.1(u)(1), 1605.1(u)(2), and 1605.1(u)(3) of this Article shall not apply to an external power supply manufactured before July 1, 2017, that:
(A) Is an AC-to-AC external power supply;
(B) Has a nameplate output of 20 watts or more;
(C) Is certified to the Secretary as being designed to be connected to a security or life safety alarm or surveillance system component; and
(D) On establishment within the External Power Supply International Efficiency Marking Protocol, as referenced in the "Energy Star Program Requirements for Single Voltage External Ac-Dc and Ac-Ac Power Supplies" (incorporated by reference in 10 C.F.R. section 430.3), published by the Environmental Protection Agency, of a distinguishing mark for products described in this clause, is permanently marked with the distinguishing mark.

(7) **FDA Listing.** An external power supply shall not be subject to the standards in sections 1605.1(u)(1), 1605.1(u)(2), and 1605.1(u)(3) of this Article if it is a device that requires Federal Food and Drug Administration (FDA) listing and approval as a medical device in accordance with section 513 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360(c)).

(8) **Exclusion of Battery Chargers Used in a Product that is Fully or Primarily Motor Operated.** A direct operation, AC-DC external power supply with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps that charges the battery of a product that is fully or primarily motor operated shall not be subject to the standards in section 1605.1(u)(2) of this Article.

~~**Table U-2**~~
~~**Federal Standards for Direct Operation External Power Supplies**~~

~~*Single-Voltage External AC-DC Power Supply, Basic-Voltage*~~		
~~*Nameplate Output Power (P_{out})*~~	~~*Minimum Average Efficiency in Active Mode (expressed as a decimal)*~~	~~*Maximum Power in No Load Mode (Watts)*~~
~~$P_{out} \leq 1$ W~~	~~$\geq 0.5 \times P_{out} + 0.16$~~	~~≤ 0.100~~
~~1 W < $P_{out} \leq 49$ W~~	~~$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$~~	~~≤ 0.100~~
~~49 W < $P_{out} \leq 250$ W~~	~~≥ 0.880~~	~~≤ 0.210~~
~~$P_{out} > 250$ W~~	~~≥ 0875~~	~~≤ 0.500~~
~~*Single-Voltage External AC-DC Power Supply, Low-Voltage*~~		
~~*Nameplate Output Power (P_{out})*~~	~~*Minimum Average Efficiency in Active Mode (expressed as a decimal)*~~	~~*Maximum Power in No Load Mode (Watts)*~~
~~$P_{out} \leq 1$ W~~	~~$\geq 0.517 \times P_{out} + 0.087$~~	~~≤ 0.100~~
~~1 W < $P_{out} \leq 49$ W~~	~~$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$~~	~~≤ 0.100~~
~~49 W < $P_{out} \leq 250$ W~~	~~≥ 0.870~~	~~≤ 0.210~~
~~$P_{out} > 250$ W~~	~~≥ 0875~~	~~≤ 0.500~~
~~*Single-Voltage External AC-AC Power Supply, Basic-Voltage*~~		
~~*Nameplate Output Power (P_{out})*~~	~~*Minimum Average Efficiency in Active Mode (expressed as a decimal)*~~	~~*Maximum Power in No Load Mode (Watts)*~~
~~$P_{out} \leq 1$ W~~	~~$\geq 0.5 \times P_{out} + 0.16$~~	~~≤ 0.210~~
~~1 W < $P_{out} \leq 49$ W~~	~~$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$~~	~~≤ 0.210~~
~~49 W < $P_{out} \leq 250$ W~~	~~≥ 0.880~~	~~≤ 0.210~~
~~$P_{out} > 250$ W~~	~~≥ 0875~~	~~≤ 0.500~~

~~*Single-Voltage External AC-AC Power Supply, Low-Voltage*~~		
~~*Nameplate Output Power (P_{out})*~~	~~*Minimum Average Efficiency in Active Mode (expressed as a decimal)*~~	~~*Maximum Power in No Load Mode (Watts)*~~
~~49 W < P_{out} ≤ 250 W~~	~~≥ 0.870~~	~~≤ 0.210~~
~~P_{out} > 250 W~~	~~≥ 0.875~~	~~≤ 0.500~~
~~*Multiple-Voltage External Power Supply*~~		
~~*Nameplate Output Power (P_{out})*~~	~~*Minimum Average Efficiency in Active Mode (expressed as a decimal)*~~	~~*Maximum Power in No Load Mode (Watts)*~~
~~P_{out} ≤ 1 W~~	~~≥ 0.497 x P_{out} + 0.067~~	~~≤ 0.300~~
~~1 W < P_{out} ≤ 49 W~~	~~≥ 0.075 x ln(P_{out}) + 0.561~~	~~≤ 0.300~~
~~P_{out} > 49 W~~	~~≥ 0.860~~	~~≤ 0.300~~

~~1. An external power supply shall not be subject to the standards in Table U-2 if it is a device that requires Federal Food and Drug Administration (FDA) listing and approval as a medical device in accordance with section 513 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360(c)).~~

~~2. A direct operation, AC-DC external power supply with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps that charges the battery of a product that is fully or primarily motor operated shall not be subject to the standards in Table U-2.~~

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

See ~~S~~section 1605.3(v) of this Article for energy efficiency standards for computers, computer monitors, televisions, signage displays, and consumer audio and video equipment.

(w) Battery Chargers and Battery Charger Systems.

(1) **Federally Regulated Battery Chargers Manufactured on or after June 13, 2018.** Federally regulated battery chargers manufactured on or after June 13, 2018 must have a unit energy consumption (UEC) less than or equal to the prescribed "Maximum UEC" standard when using the equations for the appropriate product class and corresponding rated battery energy as shown in Table W-1:

Table W-1
Standards for Federally Regulated Battery Chargers
Manufactured on or after June 13, 2018

Product Class	*Product Class Description*	*Rated Battery Energy (E_{batt}**)*	*Special characteristic or battery voltage*	*Maximum UEC (kWh/yr) (as a function of E_{batt}**)*
1	Low-Energy	≤ 5 Wh	Inductive Connection*	3.04
2	Low-Energy, Low-Voltage	< 100 Wh	< 4 V	0.1440 * E_{batt} + 2.95
3	Low-Energy, Medium-Voltage	< 10 Wh	≥ 4 V and ≤ 10 V	1.42 kWh/year
		≥ 10 Wh		0.0255 * E_{batt} + 1.16
4	Low-Energy High-Voltage		> 10 V	0.11 * E_{batt} + 3.18
5	Medium-Energy Low-Voltage	≥100 Wh and ≤ 3000 Wh	< 20 V	0.0257 * E_{batt} + 0.815
6	Medium-Energy High-Voltage		≥ 20 V	0.0778 * E_{batt} + 2.4

7	High-Energy	> 3000 Wh		0.0502 * E_{batt} + 4.53
*Inductive connection and designed for use in a wet environment (*e.g.* electric toothbrushes). **E_{batt} = Rated battery energy as determined in 10 C.F.R. part 429.39(a).				

EXCEPTIONS to Battery Charger Standards in section 1605.1(w)(1) of this Article. A battery charger shall not be subject to the standards in section 1605.1(w)(1) of this Article if it is a device that requires Federal Food and Drug Administration (FDA) listing and approval as a life-sustaining or life-supporting device in accordance with section 513 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360(c)).

~~There are no energy efficiency standards or energy design standards for battery charger systems.~~
(2) See section 1605.3(w) of this Article for energy efficiency standards for battery charger systems.

The following documents are incorporated by reference in ~~S~~section 1605.1.

Number ***Title***

FEDERAL STATUTES AND REGULATIONS

C.F.R., Title 10, section 429.39(a)
C.F.R., Title 10, section 429.44
C.F.R., Title 10, section 429.59
C.F.R., Title 10, part 430, subpart B, appendix AA
C.F.R., Title 10, part 430.2
C.F.R., Title 10, part 430.3
C.F.R., Title 10, sections 430.23(a) (Appendix A to subpart B of part 430)
C.F.R., Title 10, sections 430.23(b) (Appendix B to subpart B of part 430)
C.F.R., Title 10, section 430.32(c)
C.F.R., Title 10, section 430.32(d)
C.F.R., Title 10, section 430.32 (w)(1)
C.F.R., Title 10, sections 431.63
C.F.R., Title 10, sections 431.66(d)(2)(i) through (iii)
C.F.R., Title 10, section 431.110
C.F.R., Title 10, section 431.324
C.F.R., Title 10, section 431.326(b)(3)
C.F.R., Title 10, section 431.462
C.F.R., Title 10, part 431, subpart K, Appendix A
C.F.R., Title 10, section 431.465(c)(6)
C.F.R., Title 10, part 431, subpart Y, Appendix A, Section II.B
C.F.R., Title 10, part 50, "Domestic Licensing of Production and Utilization Facilities"

Copies available from: Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
www.ecfr.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

	EPA "External Power Supply International Efficiency Marking Protocol"
Copies available from:	US EPA Climate Protection Partnership ENERGY STAR Programs Hotline & Distribution (MS-6202J) 1200 Pennsylvania Ave NW Washington, DC 20460 www.energystar.gov

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

AHRI 1200-2006	Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets
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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C78.5	Standard for Electric Lamps – Specifications for Performance of Self-Ballasted Compact Fluorescent Lamps
Copies available from:	American National Standards Institute 1819 L Street, NW, 6th Floor Washington, DC 20036 www.ansi.org Phone: (202) 293-8020 FAX: (202) 293-9287

ILLUMINATING ENGINGEERING SOCIETY (IES)

IES LM-65	Life Testing of Compact Fluorescent Lamps
Copies available from:	Illuminating Engineering Society 120 Wall Street, 17th Floor New York, NY 10005-4001 www.ies.org Phone: (212) 248-5000 FAX: (212) 248-5017/18

NATIONAL ELECTRIC CODE (NEC)

NFPA 70 (2002)	National Electrical Code section 410.4(A)
Copies available from:	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org Phone: (617) 770-3000

FAX: (617) 770-0700

NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION (NEMA)

NEMA Standard TP-1-2002, Table 4-2	Guide for Determining Energy Efficiency of Distribution Transformers
Copies available from:	National Electric Manufacturers Association 1300 N. 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org Phone: (703) 841-3200 FAX: (703) 841-3300

UNDERWRITERS LABS (UL)

UL 1029-2001	Standard for High-Intensity-Discharge Lamp Ballasts
Copies available from:	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com Phone: (847) 272-8800 FAX: (847) 272-8129

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1605.2. State Standards for Federally-Regulated Appliances.

(a) Refrigerators, Refrigerator-Freezers and Freezers.

~~See Sections 1605.1(a) and 1605.3(a) for energy efficiency standards and energy design standards for refrigeration equipment.~~

(1) **Federally Regulated Refrigerators, Refrigerator-Freezers, Freezers, and Other Refrigeration Equipment.** See section 1605.1(a) of this Article for energy efficiency standards and energy design standards for:
(A) consumer refrigeration products including
1. miscellaneous refrigeration, including but not limited to coolers manufactured on or after October 28, 2019;
(B) commercial refrigerators, commercial freezers, commercial refrigerator-freezers including hybrid commercial refrigerator-freezers; automatic commercial ice makers; walk-in coolers and walk-in freezers; and refrigerated canned and bottled beverage vending machines.

(2) **Coolers, Freezers, and Water Dispensers.** See section 1605.3(a) of this Article for energy efficiency standards and energy design standards for:
(A) consumer refrigeration coolers manufactured before October 28, 2019;
(B) freezers that exceed 30 ft^3, do not exceed 39 ft^3, and that are consumer products; and
(C) water dispensers.

(b) Room Air Conditioners, Room Air Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.

See ~~S~~section 1605.1(b) of this Article for energy efficiency standards for room air conditioners, room air-conditioning heat pumps, packaged terminal air conditioners, and packaged terminal heat pumps that are federally-regulated consumer products or federally-regulated commercial and industrial equipment.

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

(1) **Central Air Conditioners.** See ~~S~~sections 1605.1(c) and 1605.3(c) of this Article for energy efficiency standards for central air conditioners.

(2) **Gas-fired Air Conditioners and Heat Pumps.** There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.

(3) **Air Filters and Heat Pump Water-Heating Packages.** ~~There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.~~ There are no energy efficiency standards or energy design standards for air filters and heat pump water-heating packages.

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

Fans.

(1) **Ceiling Fans, Ceiling Fan Light Kits, Dehumidifiers, and Residential Furnace Fans.** (A) See Ssections 1605.1(d) of this Article for energy design standards for ceiling fans and ceiling fan light kits.
(B) See section 1605.1(d) of this Article for energy efficiency standards for ceiling fan light kits, dehumidifiers, and residential furnace fans.

(2) See Sections 1605.1(d) for energy efficiency standards for dehumidifiers.

(3) There are no energy efficiency standards or energy design standards for spot portable air conditioners, evaporative coolers, whole house fans, or residential exhaust fans. There are no energy efficiency standards for ceiling fans and ceiling fan light kits.

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

(1) **Gas and Oil Space Heaters.** See Ssections 1605.1(e) and 1605.3(e) of this Article for energy efficiency standards for gas and oil space heaters, including but not limited to furnaces and boilers.

(2) **Combination Space-Heating and Water-Heating Appliances.** See Ssection 1605.3(e) of this Article for energy efficiency standards for combination space-heating and water-heating appliances.

(f) Water Heaters.

(1) **Water Heaters.** See Ssections 1605.1(f) and 1605.3(f)of this Article for energy efficiency standards for water heaters.

(2) **Combination Space-Heating and Water-Heating Appliances.** See Ssection 1605.3(e) of this Article for energy efficiency standards for combination space-heating and water-heating appliances.

(g) Pool Heaters, Portable Electric Spas, Pumps, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.

(1) **Pool Heaters.** See Ssections 1605.1(g) and 1605.3(g) of this Article for energy efficiency standards and energy design standards for pool heaters.

(2) **Portable Electric Spas, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.** See Ssection 1605.3(g) of this Article for energy efficiency standards and energy design standards for portable electric spas, and residential pool pump and motor combinations, and replacement residential pool pump motors.

(3) **Pumps.** See section 1605.1(g)(6) for energy efficiency standards for federally regulated pumps that are manufactured on or after January 27, 2020.

(h) Plumbing Fittings.

See ~~S~~sections 1605.1(h) and 1605.3(h) of this Article for water efficiency standards for plumbing fittings.

(i) Plumbing Fixtures.

See ~~S~~section 1605.3(i) of this Article for water efficiency standards for plumbing fixtures.

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

(1) **Federally Regulated Fluorescent Lamp Ballasts.** See ~~S~~section 1605.1(j) of this Article for energy efficiency standards for fluorescent lamp ballasts that are federally- regulated consumer products.

(2) **State-Regulated Deep Diming Fluorescent Lamp Ballasts.** See ~~S~~section 1605.3(j) of this Article for energy efficiency standards for deep dimming fluorescent lamp ballasts that are state-regulated.

(k) Lamps.

See ~~S~~sections 1605.1(k) and 1605.3(k) of this Article for energy efficiency standards for lamps.

(l) Emergency Lighting and Self-Contained Lighting Controls.

(1) **Illuminated Exit Signs** ~~Emergency Lighting~~**.** See ~~S~~section 1605.1(l) of this Article for energy efficiency standards for illuminated exit signs.

(2) **Self-Contained Lighting Controls.** See ~~S~~section 1605.3(l) of this Article for design standards for self-contained lighting controls.

(m) Traffic Signal Modules ~~and Traffic Signal Lamps~~.

See ~~S~~sections 1605.1(m) and 1605.3(m) of this Article for energy efficiency standards for traffic signal modules ~~and traffic signal lamps~~.

(n) Luminaires and Torchieres.

(1) **Torchieres.** See section 1605.1(n) of this Article for energy efficiency standards and energy design standards for torchieres manufactured on and after January 1, 2006.

(~~1~~2) **Federally Regulated Metal Halide Light Fixtures.** See ~~S~~section 1605.1(n) of this Article for energy efficiency standards and energy design standards for federally regulated metal halide light fixtures manufactured on or after January 1, 2009~~, and torchieres~~.

(~~2~~3) **Under-Cabinet Luminaires.** See ~~S~~section 1605.3(n) of this Article for energy efficiency standards and energy design standards for~~:~~

~~(A) metal halide luminaires sold or offered for sale in California that are manufactured~~

~~1. prior to January 1, 2009, or~~

~~2. on or after January 1, 2010; and~~

~~(B)~~ under-cabinet luminaires.

(o) Dishwashers.

See ~~S~~section 1605.1(o) of this Article for energy efficiency standards for dishwashers that are federally- regulated consumer products.

(p) Clothes Washers.

~~(1)~~ **Energy Efficiency and Water Efficiency Standards for Residential and Commercial Clothes Washers.** See ~~S~~section 1605.1(p) of this Article for energy-efficiency and water efficiency standards for residential and commercial clothes washers.

~~(2) **Water Efficiency Standards for Commercial Clothes Washers.** See Section 1605.1(p) for energy efficiency standards and water efficiency standards for clothes washers that are not consumer products.~~

~~(3) **Energy Efficiency Standards for Clothes Washers.** See Section 1605.1(p) for energy efficiency standards and energy design standards for clothes washers.~~

(q) Clothes Dryers.

See ~~S~~section 1605.1(q) of this Article for energy efficiency standards and energy design standards for clothes dryers that are federally- regulated consumer products.

(r) Cooking Products and Food Service Equipment.

(1) **Hot Food Holding Cabinets.** See ~~S~~section 1605.3(r) of this Article for energy efficiency standards for commercial hot food holding cabinets.

(2) **Cooking Products.** See ~~S~~section 1605.1(r) of this Article for energy efficiency standards and energy design standards for cooking products that are federally- regulated consumer products.

(3) **Other Cooking Products and Food Service Equipment.** There is no energy efficiency standard for other cooking products or food service equipment.

(s) Electric Motors and Compressors.

(1) **Electric Motors.** See ~~S~~section 1605.1(s) of this Article for energy efficiency standards for electric motors that are federally- regulated commercial and industrial equipment.

(2) **Compressors.** There are no energy efficiency standards for federally regulated compressors.

(t) Distribution Transformers.

See ~~S~~section 1605.1(t) of this Article for energy efficiency standards for low-voltage dry-type distribution transformers, liquid-immersed distribution transformers, and medium-voltage dry-type distribution transformers.

(u) External Power Supplies.

(1) See ~~S~~section 1605.1(u) of this Article for energy efficiency standards for ~~Class A external~~ federally regulated external power supplies ~~that are federally regulated and manufactured on or after July 1, 2008~~.

(2) See ~~S~~section 1605.3(u) of this Article for energy efficiency standards for state-regulated external power supplies.

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

See ~~S~~section 1605.3(v) of this Article for energy efficiency standards for computers, computer monitors, televisions, signage displays, and consumer audio and video equipment.

(w) Battery Chargers and Battery Charger Systems.

~~There are no energy efficiency standards or energy design standards for battery charger systems.~~

(1) **Federally Regulated Battery Chargers.** See section 1605.1(w) of this Article for energy efficiency standards for federally regulated battery chargers.

(2) **State-Regulated Battery Charger Systems.** See section 1605.3(w) of this Article for energy efficiency standards for battery charger systems.

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

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

(a) Refrigerators, Refrigerator-Freezers, and Freezers.

(1) **Energy Efficiency Standard for ~~Wine Chillers~~Coolers.** The energy consumption of ~~wine chillers~~coolers manufactured before October 28, 2019 that are designed and sold for use by an individual shall be no greater than the applicable values shown in Table A-~~11~~15.

Table A-~~11~~15
Standards for Coolers~~Wine Chillers~~

Appliance	*Maximum Annual Energy Use~~Consumption~~ (kWh)*
~~Wine chillers~~Coolers with manual defrost	13.7V + 267
~~Wine chillers~~Coolers with automatic defrost	17.4V + 344
V = volume in ft^3.	

(2) ~~Energy Efficiency Standard for Freezers.~~ ~~The energy consumption of freezers that exceed 30 ft^3, do not exceed 39 ft^3, are designed and sold for use by an individual consumer, and are manufactured on or after March 1, 2003, shall be no greater than the applicable values shown in Table A-12.~~

~~**Table A-12**~~
~~**Standards for Freezers that are Consumer Products**~~

~~*Appliance*~~	~~*Maximum Annual Energy Consumption (kWh)*~~
~~Upright Freezers with manual defrost~~	~~7.55AV + 258.3~~
~~Upright Freezers with automatic defrost~~	~~12.43AV + 326.1~~
~~Chest Freezers~~	~~9.88AV + 143.7~~
~~AV = adjusted total volume, expressed in ft^3, which is 1.73 x freezer volume (ft^3).~~	

~~(3) **Energy Design Standard for Lighting of Cabinets and Wine Chillers Manufactured Before January 1, 2012.** Internal illumination of the following appliances, manufactured on or after March 1, 2003, and manufactured before January 1, 2012, shall be only by (1) T-8 fluorescent lamps with electronic ballasts, or (2) a lighting system that has no fewer lumens per watt than a system using only T-8 fluorescent lamps with electronic ballasts.~~

~~(A) remote reach-in cabinets with transparent doors; remote pass-through cabinets with transparent doors; and remote roll-in or roll-through cabinets with transparent doors;~~

~~(B) cabinets, without doors; and~~

~~(C) wine chillers that are not consumer products.~~

~~(4) **Energy Design Standards for Walk-In Coolers and Walk-In Freezers.**~~

~~(5) **Energy Efficiency Standards for Wine Chillers That Are Not Consumer Products and That Are Manufactured Before January 1, 2012.** The daily energy consumption of wine chillers that are not consumer products manufactured on or after the effective dates shown and before January 1, 2012, shall be no greater than the applicable values shown in Table A-13.~~

~~**Table A-13**~~
~~**Standards for Wine Chillers that are Not Consumer Products and**~~

~~That Are Manufactured Before January 1, 2012~~

~~*Appliance*~~	~~*Doors*~~	~~*Maximum Daily Energy Consumption(kWh)*~~	
		~~*January 1, 2006*~~	~~*January 1, 2007*~~
~~Wine chillers that are not consumer products~~	~~Solid~~	~~0.10V + 2.04~~	~~0.10V + 2.04~~
	~~Transparent~~	~~0.172V + 4.77~~	~~0.12V + 3.34~~

~~(6)~~ **Energy Efficiency Standard for Water Dispensers.** The standby energy consumption of bottle-type water dispensers, and point of use water dispensers, dispensing both hot and cold water, manufactured on or after January 1, 2006, shall not exceed 1.2 kWh/day.

(~~7~~3) ~~**Other Refrigeration Equipment.** See Section 1605.1(a) for energy efficiency standards for refrigerators, refrigerator-freezers, and freezers.~~

See section 1605.1(a) of this Article for energy efficiency standards and energy design standards for:

(A) consumer refrigeration products including
1. miscellaneous refrigeration, including but not limited to coolers manufactured on or after October 28, 2019;

(B) commercial refrigerators, commercial freezers, commercial refrigerator-freezers including hybrid commercial refrigerator-freezers; automatic commercial ice makers; walk-in coolers and walk-in freezers; and refrigerated canned and bottled beverage vending machines.

(b) Room Air Conditioners, Room Air-Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.

See ~~S~~section 1605.1(b) of this Article for energy efficiency standards for room air- conditioners, room air conditioning heat pumps, packaged terminal air conditioners, and packaged terminal heat pumps that are federally- regulated consumer products or federally- regulated commercial and industrial equipment.

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

(1) **Energy Efficiency Standards for Ground Water-Source Heat Pumps and Ground-Source Closed-Loop Heat Pumps.** The EER and COP for ground water-source heat pumps and ground-source closed-loop heat pumps manufactured on or after October 29, 2003, shall be not less than the applicable values shown in Table C-~~9~~10.

Table C-~~9~~10
Standards for Ground Water-Source and Ground-Source Heat Pumps

Appliance	*Rating Condition*	*Minimum Standard*
Ground water-source heat pumps (cooling)	59°F entering water temperature	16.2 EER
Ground water-source heat pumps (heating)	50°F entering water temperature	3.6 COP

Ground-source closed-loop heat pumps (cooling)	77°F entering brine temperature	13.4 EER
Ground-source closed-loop heat pumps (heating)	32°F entering brine temperature	3.1 COP

(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~~s~~ C-11~~0~~.

(A) **Computer Room Air Conditioners.** See ~~S~~section 1605.1(c) of this Article for energy efficiency standards for air-cooled computer room air conditioners, glycol-cooled computer room air conditioners, and water-cooled computer room air conditioners.

Table C-11~~0~~
Standards for Evaporatively Cooled Computer Room Air Conditioners

Appliance	*Cooling Capacity (Btu/hr)*	*Minimum EER (Btu/watt-hour)*	
		~~Air-Cooled Effective January 1, 2006~~	***~~Water-Cooled, Glycol-Cooled, and~~ Evaporatively- Cooled Effective October 29, 2006***
Computer room air conditioners	< 65,000	~~11.0~~	11.1
	≥ 65,000 and < 135,000	~~10.4~~	10.5
	≥ 135,000 and < 240,000	~~10.2~~	10.0

(3) **Gas-fired Air Conditioners and Heat Pumps.** There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.

(4) **Other Central Air Conditioners.** See ~~S~~section~~s~~ 1605.1(c) ~~and 1605.2(e)~~ of this Article for energy efficiency standards for central air conditioners that are federally- regulated consumer products or federally- regulated commercial and industrial equipment.

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

(6) Air Filters. There is no energy efficiency standard or energy design standard for air filters.

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

(1) See ~~S~~section 1605.1(d) of this Article for energy ~~design~~efficiency standards for ~~ceiling fans and~~ ceiling fan light kits, dehumidifiers, and residential furnace fans.

(2) See ~~S~~section 1605.1(d) of this Article for energy ~~efficiency~~design standards for ~~dehumidifiers~~ceiling fans.

(3) There are no energy efficiency standards or energy design standards for ~~spot~~portable air conditioners, evaporative coolers, whole house fans, or residential exhaust fans. There are no efficiency standards for ceiling fans ~~and ceiling fan light kits~~.

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

(1) **Boilers, Central Furnaces, and Duct Furnaces~~, and Unit Heaters~~.**

(A) The efficiency of boilers, central furnaces, and duct furnaces, ~~and unit heaters~~ shall be no less than, and the standby loss shall be not greater than, the applicable values shown in Tables E-7, E-8, and E-9.

Table E-7
Standards for Boilers

Appliance	*Output (Btu/hr)*	*Standards*		
		Minimum AFUE %	*Minimum Combustion Efficiency % **	*Maximum Standby Loss (watts)*
Gas steam boilers with 3-phase electrical supply	< 300,000	75	—	—
All other boilers with 3-phase electrical supply	< 300,000	80	—	—
Natural gas, non-packaged boilers	≥ 300,000	—	80	147
LPG Non-packaged boilers	≥ 300,000	—	80	352
Oil, non-packaged boilers	≥ 300,000	—	83	—
*At both maximum and minimum rated capacity, as provided and allowed by the controls.				

Table E-8
Standards for Central Furnaces

Appliance	*Application*	*Minimum Efficiency %*
Central furnaces with 3-phase electrical supply < 225,000 Btu/hour	Mobile Home	75 AFUE
	All others	78 AFUE or 80 Thermal Efficiency (at manufacturer's option)

Table E-9
Standards for Duct Furnaces

Appliance	*Fuel*	*Standards*		
		Minimum Thermal Efficiency %[1]		*Maximum Energy Consumption during standby (watts)*
		At maximum rated capacity	*At minimum rated capacity*	
Duct furnaces	Natural gas	80	75	10
Duct furnaces	LPG[2]	80	75	147

[1] As provided and allowed by the controls.
[2] Designed expressly for use with LPG.

(B) Natural gas-fired duct furnaces manufactured on or after January 1, 2006, shall have either power venting or an automatic flue damper.

(C) See ~~S~~section 1605.1(e) of this Article for:
1. design standards for unit heaters ~~effective for models~~ manufactured on or after August 8, 2008;
2. efficiency standards for wall furnaces, floor furnaces, room heaters, gas- and oil-fired central furnaces and residential electric furnaces that are federally regulated consumer products; and

3. efficiency standards and design standards for boilers that are federally regulated consumer products.

(2) **Oil Wall Furnaces, Oil Floor Furnaces, and Infrared Gas Space Heaters.** There are no energy efficiency standards or energy design standards for oil wall furnaces, oil floor furnaces, or infrared gas space heaters.

(3) **Combination Space-Heating and Water-Heating Appliances.**

(A) If part of a combination space-heating and water-heating appliance is a water heater, that part shall comply with the applicable water heater standards in ~~S~~sections~~ 1605.1(f) and 1605.3(f)~~ of this Article.

(B) If part of a combination space-heating and water-heating appliance is a furnace, boiler, or other space heater, that part shall comply with the applicable furnace, boiler, or other space heater standards in ~~S~~sections 1605.1(e) and 1605.3(e) of this Article.

(C) Water heaters that are federally- regulated appliances, and that are contained in combination space-heating and water-heating appliances that are federally- regulated appliances, are required only to meet the standard for the applicable type of water heater, and are not required to meet any standard for space heaters.

(4) **Other Gas and Oil Space Heaters**. See ~~S~~section 1605.1(e) of this Article for standards for gas and oil space heaters that are federally- regulated.

(f) Water Heaters.

~~(1) **Hot Water Dispensers and Mini-Tank Electric Water Heaters.**~~

~~The standby loss of hot water dispensers and mini-tank electric water heaters manufactured on or after March 1, 2003 shall be not greater than 35 watts.~~

~~**Exception to Section 1605.1(f)(1):** Section 1605.3(f)(1) does not apply to any water heater:~~

~~1. that is within the scope of 42 U.S.C. sections 6292(a)(4) or 6311(1)(F),~~

~~2. that has a rated storage volume of less than 20 gallons, and~~

~~3. for which there is no federal test method applicable to that type of water heater.~~

~~(2) **Small Water Heaters that are Not Federally-Regulated Consumer Products.**~~

~~The energy factor of small water heaters manufactured on or after March 1, 2003 that are not federally-regulated consumer products, other than hot water dispensers, booster water heaters, and mini-tank electric water heaters, shall be not less than the applicable values shown in Table F-4.~~

~~**Exception to Section 1605.1(f)(2):** Section 1605.3(f)(2) does not apply to any water heater:~~

~~1. that is within the scope of 42 U.S.C. sections 6292(a)(4) or 6311(1)(F),~~

~~2. that has a rated storage volume of less than 20 gallons, and~~

~~3. for which there is no federal test method applicable to that type of water heater.~~

~~**Table F-4**~~

~~Standards for Small Water Heaters that are Not Federally- Regulated Consumer Products~~

~~*Appliance*~~	~~*Energy Source*~~	~~*Input Rating*~~	~~*Rated Storage Volume (gallons)*~~	~~*Minimum Energy Factor*[1]~~
~~Storage water heaters~~	~~Gas~~	~~≤ 75,000 Btu/hr~~	~~< 20~~	~~0.62 – (.0019 x V)~~
~~Storage water heaters~~	~~Gas~~	~~≤ 75,000 Btu/hr~~	~~> 100~~	~~0.62 – (.0019 x V)~~
~~Storage water heaters~~	~~Oil~~	~~≤ 105,000 Btu/hr~~	~~> 50~~	~~0.59 – (.0019 x V)~~
~~Storage water heaters~~	~~Electricity~~	~~≤ 12 kW~~	~~> 120~~	~~0.93 – (.00132 x V)~~
~~Instantaneous Water Heaters~~	~~Gas~~	~~≤ 50,000 Btu/hr~~	~~Any~~	~~0.62 – (.0019 x V)~~
~~Instantaneous Water Heaters~~	~~Gas~~	~~≤ 200,000 Btu/hr~~	~~≥ 2~~	~~0.62 – (.0019 x V)~~
~~Instantaneous Water Heaters~~	~~Oil~~	~~≤ 210,000 Btu/hr~~	~~Any~~	~~0.59 – (.0019 x V)~~
~~Instantaneous Water Heaters~~	~~Electricity~~	~~≤ 12 kW~~	~~Any~~	~~0.93 – (.00132 x V)~~
~~[1] Volume (V) = rated storage volume in gallons.~~				

(~~3~~1) **Energy Efficiency Standards for Combination Space-Heating and Water-Heating Appliances.** See ~~S~~section 1605.3(e)(3) of this Article for standards for combination space-heating and water-heating appliances.

(~~4~~2) **Other ~~Energy Effieiency~~ Standards for Water Heaters.** See ~~S~~section 1605.1(f) of this Article for standards for water heaters that are federally- regulated ~~consumer products or federally- regulated commercial and industrial equipment~~.

~~(5) **Energy Efficiency Standards for Booster Water Heaters.** There is no energy efficiency standard or energy design standard for booster water heaters.~~

(g) Pool Heaters, Portable Electric Spas, Pumps, Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.

(1) **Energy Design Standard for Natural Gas Pool Heaters.** Natural gas pool heaters shall not be equipped with constant burning pilots.

(2) **Energy Design Standard for Heat Pump Pool Heaters.** Heat pump pool heaters shall have a readily accessible on-off switch that is mounted on the outside of the heater and that allows shutting off the heater without adjusting the thermostat setting.

(3) **Energy Efficiency Standard for Heat Pump Pool Heaters.** For heat pump pool heaters manufactured on or after March 1, 2003, the average of the ~~coefficient of performance (~~COP~~)~~ at Standard Temperature Rating and the ~~coefficient of performance (~~COP~~)~~ at Low Temperature Rating shall be not less than 3.5.

(4) **Energy Efficiency Standards for ~~Gas and Oil~~ Fossil Fuel-Fired Pool Heaters.** See ~~S~~section 1605.1(g) of this Article for energy efficiency standards for ~~gas and oil~~fossil fuel-fired pool heaters that are federally~~-~~ regulated consumer products.

(5) **Residential Pool Pump and Motor Combinations, and Replacement Residential Pool Pump Motors.**

(A) **Motor Efficiency.** Pool pump motors manufactured on or after January 1, 2006 may not be split-phase or capacitor start -~~-~~ induction run type.

(B) **Two-, Multi-, or Variable-Speed Capability.**

1. **Residential Pool Pump Motors.** Residential pool pump motors with a pool pump motor capacity of 1 HP or greater which are manufactured on or after January 1, 2010, shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate. The pump motor must be operated with a pump control that shall have the capability of operating the pump at least at two speeds.

2. **Pump Controls.** Pool pump motor controls manufactured on or after January 1, 2008 that are sold for use with a two- or more speed pump shall have the capability of operating the pool pump at least at two speeds. The control's default circulation speed setting shall be no more than one-half of the motor's maximum rotation rate. Any high speed override capability shall be for a temporary period not to exceed one 24-hour cycle without resetting to default settings.

(6) **Portable Electric Spas.** The normalized standby power, as defined in ~~S~~section 1604(g)(2)(I) of this Article, of portable electric spas manufactured on or after January 1, 2006, shall be not greater than $5(V^{2/3})$ watts where V = the fill volume, in gallons.

(h) Plumbing Fittings.

(1) **Tub Spout Diverters and Showerhead Tub Spout Diverter Combinations.** The leakage rate of tub spout diverters manufactured on or after March 1, 2003 shall be not greater than the applicable values shown in Table H-~~2~~3.

(A) **Showerhead tub spout diverter combinations.** Showerhead tub spout diverter combinations shall meet both the standard for showerheads and the standard for tub spout diverters.

Table H-~~2~~3
Standards for Tub Spout Diverters

Appliance	*Testing Conditions*	*Maximum Leakage Rate*
Tub spout diverters	When new	0.01 gpm
	After 15,000 cycles of diverting	0.05 gpm

(2) **Lavatory Faucets and Aerators.** The flow rate of lavatory faucets and lavatory replacement aerators manufactured on or after July 1, 2016 shall be not greater than 1.2 gpm at 60 psi~~the applicable values shown in Table H-3~~.

(A) **Sprayheads with independently controlled orifices and manual controls.** The maximum flow rate of each orifice that manually turns on or off shall not exceed the maximum flow rate for a lavatory faucet.

(B) **Sprayheads with collectively controlled orifices and manual controls.** The maximum flow rate of a sprayhead that manually turns on or off shall be the product of (a) the maximum flow rate for a lavatory faucet and (b) the number of component lavatories (rim space of the lavatory in inches (millimeters) divided by 20 inches (508 millimeters)).

~~**Table H-3**~~
~~**Standards for Lavatory Faucets and Aerators**~~

~~***Appliance***~~	~~***Maximum Flow Rate***~~		
	~~Manufactured prior to September 1, 2015~~	~~Manufactured on or after September 1, 2015, and prior to July 1, 2016~~	~~Manufactured on or after July 1, 2016~~
~~Lavatory faucets and aerators~~	~~2.2 gpm at 60 psi[1,2]~~	~~1.5 gpm at 60 psi[1,2]~~	~~1.2 gpm at 60 psi[1,2]~~

~~[1] **Sprayheads with independently-controlled orifices and manual controls.** The maximum flow rate of each orifice that manually turns on or off shall not exceed the maximum flow rate for a lavatory faucet.~~
~~[2] **Sprayheads with collectively-controlled orifices and manual controls.** The maximum flow rate of a sprayhead that manually turns on or off shall be the product of (a) the maximum flow rate for a lavatory faucet and (b) the number of component lavatories (rim space of the lavatory in inches (millimeters) divided by 20 inches (508 millimeters)).~~

(3) **Kitchen Faucets and Aerators and Public Lavatory Faucets and Aerators.** The flow rate of kitchen faucets, kitchen replacement aerators, public lavatory faucets, and public lavatory replacement aerators sold or offered for sale on or after January 1, 2016 shall be not greater than the applicable values shown in Table H-4.

(A) For the plumbing fittings identified in Table H-4, noncompliant products may not be sold or offered for sale on or after January 1, 2016, regardless of manufacture date.

Table H-4
Standards for Kitchen Faucets and Aerators and Public Lavatory Faucets and Aerators

Appliance	*Maximum Flow Rate*	
	~~Sold or offered for sale prior to January 1, 2016~~	~~Sold or offered for sale on or after January 1, 2016~~
Kitchen faucets and aerators	~~2.2 gpm at 60 psi~~	1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
Public lavatory faucets and aerators	~~2.2 gpm at 60 psi~~	0.5 gpm at 60psi

(4) **Commercial Pre-rinse Spray Valves.**

(A) Commercial pre-rinse spray valves manufactured on or after January 1, 2006, shall be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate.

(B) See ~~S~~section 1605.1(h) of this Article for water consumption standards for commercial pre-rinse spray valves.

(5) **Showerheads.** The flow rate of showerheads shall be not greater than the applicable values shown in Table H-5.

Table H-5
Standards for Showerheads

Appliance	*Maximum Flow Rate*		
	~~Manufactured on or after January 1, 1994 and prior to July 1, 2016~~	Manufactured on or after July 1, 2016 and prior to July 1, 2018	Manufactured on or after July 1, 2018
Showerheads	~~2.5 gpm at 80 psi~~	2.0 gpm at 80 psi[1,2,3]	1.8 gpm at 80 psi[1,2,3]

[1] **Maximum flow rate.** The maximum flow rate shall be the highest value obtained through testing at a flowing pressure of 80 ± 1 psi and shall not exceed the maximum flow rate in Table H-~~4~~5.
[2] **Minimum flow rate.** The minimum flow rate, determined through testing at a flowing pressure of 20 ± 1 psi, shall be not less than 60 percent of the flow rate reported by the manufacturer pursuant to section 1606(a) of this Article. The minimum flow rate determined through testing at a flowing pressure of 45 and 80 ± 1 psi shall be not less than 75 percent of the flow rate reported by the manufacturer pursuant to section 1606(a) of this Article.
[3] **Showerheads with multiple nozzles.** The total flow rate of showerheads with multiple nozzles must be less than or equal to the maximum flow rate in Table H-~~4~~5 when any or all the nozzles are in use at the same time.

(6) **Other Plumbing Fittings.** See ~~S~~section 1605.1(h) of this Article for water efficiency standards for plumbing fittings that are federally- regulated ~~consumer products~~.

(i) Plumbing Fixtures.

(1) The water consumption of water closets~~,~~ and urinals, other than those designed and marketed exclusively for use at prisons or mental health care facilities, shall be ~~no~~ not greater than the values shown in Table I-~~2~~.

Table I-2
Standards for Plumbing Fixtures

Appliance	*Maximum Gallons per Flush or Dual-flush effective flush volume*	
	Sold or Offered for Sale On or After January 1, 2014[1]	***Sold or Offered for Sale On or After January 1, 2016[1]***
All Water Closets	1.28	1.28
Trough-Type Urinals	Trough length (inches) 16	Trough length (inches) 16
Wall-Mounted Urinals	0.5	0.125
Other Urinals	0.5	0.5
[1] For the items identified in Table I-2, noncompliant products may not be sold or offered for sale on or after the designated date, regardless of manufacture date.		

(2) Water closets sold or offered for sale on or after January 1, 2016, shall pass the Waste Extraction Test (Section 7.10) of ASME A112.19.2.

(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 July 1, 2016 shall meet the following energy conservation standards:

(A) Shall not consume more than 1 watt in standby mode;
(B) Shall have a power factor of 0.9 or greater; and
(C) Shall have a weighted ballast l~~umenous~~ luminous efficacy greater than or equal to the threshold described in the following equation:

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

*AP_{100} ~~is shorthand for~~ represents maximum arc power as defined in section 1602(j) and discussed in section 1604(j)(2) of this Article..

(2) See ~~S~~section 1605.1(j) of this Article for energy efficiency standards for fluorescent lamp ballasts that are federally- regulated consumer products.

(k) Lamps.

(1) ~~**State-Regulated**~~ **Incandescent Reflector Lamps.**
~~The average lamp efficacy of state-regulated incandescent reflector lamps manufactured on or after January 1, 2008 shall be not less than the applicable values shown in Table K-10.~~See section 1605.1(k)(2) for standards for federally regulated incandescent reflector lamps.

~~**Table K-10**~~
~~**Standards for State-Regulated Incandescent Reflector Lamps**~~

~~**Rated Lamp Wattage**~~	~~**Minimum Average Lamp Efficacy (LPW)**~~
~~40-50~~	~~10.5~~
~~51-66~~	~~11.0~~
~~67-85~~	~~12.5~~
~~86-115~~	~~14.0~~
~~116-155~~	~~14.5~~

156-205	15.0

Exceptions to Section 1605.3(k)(1): Section 1605.3(k)(1) does not apply to the following incandescent reflector lamps.

1. <= 45 watt R-20 (reflector, 2.5" diameter)
2. <= 50 watt ER-30 (ellipsoidal reflector, 3.75" diameter)
3. <= 50 watt ER-40 (ellipsoidal reflector, 5.00" diameter)
4. 65 watt ER-40 (ellipsoidal reflector, 5.00" diameter)
5. <= 50 watt BR-30 (bulge reflector, 3.75" diameter)
6. <= 50 watt BR-40 (bulge reflector, 5.00" diameter)
7. 65 watt BR-30 (bulge reflector, 3.75" diameter)
8. 65 watt BR-40 (bulge reflector, 5.00" diameter)

(2) **Standards for State-Regulated LED Lamps, State-Regulated General Service Incandescent Lamps, and General Service Lamps, and Modified Spectrum Incandescent Lamps.** The energy consumption rate of state-regulated general service incandescent lamps, gGeneral service lamps, and modified spectrum general service incandescent lamps manufactured on or after the effective dates shown in Tables K-11, K-12, and K-13 shall meet the standards shown in Table K-8. these Tables. The energy consumption rate of state-regulated LED lamps with a lumen output of 150 lumens or greater for candelabra bases, or 200 lumens or greater for other bases, manufactured on or after the effective dates shown in Table K-149 shall meet the standards shown in that table.

Table K-11
Standards for State-Regulated General Service Incandescent Lamps - Tier I

Rated Lumen Ranges	*Maximum Rated Wattage*	*Minimum Rated Lifetime*	*Effective Date*
1490-2600 Lumens	72 watts	1,000 Hours	Jan, 1, 2011
1050-1489 Lumens	53 watts	1,000 Hours	Jan 1, 2012
750-1049 Lumens	43 watts	1,000 Hours	Jan 1, 2013
310-749 Lumens	29 watts	1,000 Hours	Jan 1, 2013

Table K-128
Standards for State-Regulated General Service Lamps -Tier II

Lumen Ranges	*Minimum Lamp Efficacy*	*Minimum Rated Lifetime*	*Effective Date*
All 310-2,600	45 lumens per watt	1,000 Hours	Jan, 1, 2018

(A) These standards apply to each lamp that:
1. is intended for a general service or general illumination application (whether incandescent or not);
2. has a medium screw base or any screw base not defined in ANSI C81.61-2006;
3. is capable of being operated at a voltage at least partially within the range of 110 to 130 volts; and
4. is manufactured or imported after December 31, 2010.

(B) Each lamp described in Section 1605.3(k)(2)(A) shall have a color rendering index that is greater than or equal to:
1. 80 for nonmodified spectrum lamps; or
2. 75 for modified spectrum lamps.

~~Table K- 13~~
~~Standards for State-Regulated Modified Spectrum General Service Incandescent Lamps - Tier I~~

~~Rated Lumen Ranges~~	~~Maximum Rated Wattage~~	~~Minimum Rated Lifetime~~	~~Effective Date~~
~~1118-1950 Lumens~~	~~72 watts~~	~~1,000 Hours~~	~~Jan 1, 2011~~
~~788-1117 Lumens~~	~~53 watts~~	~~1,000 Hours~~	~~Jan 1, 2012~~
~~563-787 Lumens~~	~~43 watts~~	~~1,000 Hours~~	~~Jan 1, 2013~~
~~232-562 Lumens~~	~~29 watts~~	~~1,000 Hours~~	~~Jan 1, 2013~~

~~(C)~~ State-regulated LED lamps with lumen output of 150 lumens or greater for candelabra bases, or 200 lumens or greater for other bases, and manufactured on or after January 1, 2018 shall have:

(i) A color point that meets the requirements in Table B1 of Annex B of ANSI C78.377-2015 for color targets and color consistency.
(ii) A CRI (Ra) of 82 or greater.
(iii) Individual color scores of R1, R2, R3, R4, R5, R6, R7, and R8 of 72 or greater.
(iv) A power factor of 0.7 or greater.
(v) A rated life of 10,000 hours or greater as determined by the lumen maintenance and time to failure test procedure.
(vi) State-regulated LED lamps that have an ANSI standard lamp shape of A shall meet the omnidirectional light distribution requirements of ENERGY STAR's Product Specification for Lamps Version 2.0 (December 2015).
(vii) State-regulated LED lamps that have an ANSI standard lamp shape of B, BA, C, CA, F, or G shall meet the decorative light distribution requirements of ENERGY STAR's Product Specification for Lamps Version 1.1 (August 2014).

~~(D)~~(B) In addition to the requirements in section 1605.3(k)(2)(~~C~~A) of this Article, state-regulated LED lamps manufactured on or after July 1, 2019 shall have a standby mode power of 0.2 watt~~s~~ or less.

Table K-~~14~~9
Standards for State-Regulated LED Lamps

Effective Date	*Minimum Compliance Score*	*Minimum Efficacy Lumens Per Watt*
January 1, 2018	282	68
July 1, 2019	297	80
The compliance score shall be calculated as the sum of the efficacy and 2.3 times the CRI of a lamp.		

(3) **State-regulated Small Diameter Directional Lamps.** State-regulated small diameter directional lamps manufactured on or after January 1, 2018 must have a rated life of 25,000 hours or greater as determined by the lumen maintenance and time to failure test procedure and meet one of the following requirements:
(A) have luminous efficacy of at least 80 lumens per watt.
(B) have a minimum luminous efficacy of 70 lumens per watt or greater and a minimum compliance score of 165 or greater, where compliance is calculated as the sum of the luminous efficacy and CRI.

(4) **~~GU-24~~GU24 Base Lamps.** ~~GU-24~~GU24 base lamps shall not be incandescent lamps.

(5) See ~~S~~section 1605.1(k) of this Article for energy efficiency standards for federally-regulated lamps.

(l) Emergency Lighting and Self-Contained Lighting Controls.

(1) **Illuminated Exit Signs.** See ~~S~~section 1605.1(l) of this Article for energy efficiency standards for illuminated exit signs.

(2) Self-Contained Lighting Controls M~~m~~anufactured O~~o~~n or A~~a~~fter February 1, 2013.

(A) **All Self-Contained Lighting Controls.**

1. The manufacturer shall provide instructions for installation and start-up calibration of all self-contained lighting control devices.

2. If indicator lights are integral to a self-contained lighting control system, such indicator lights shall consume no more than 1 watt of power per indicator light.

(B) **Automatic Time-Switch Controls.**

1. Residential automatic time-switch controls labeled for use with lighting shall have program backup capabilities that prevent the loss of the device's schedule for at least 7 days, and the device's date and time for at least 72 hours if power is interrupted.

2. Commercial automatic time-switch controls labeled for use with lighting shall:

   a. have program backup capabilities that prevent the loss of the device's schedule for at least 7 days, and the device's date and time for at least 72 hours if power is interrupted;

   b. be capable of providing manual override to each connected load and shall resume normally scheduled operation after manual override is initiated within 2 hours for each connected load; and

   c. incorporate an automatic holiday shutoff feature that turns off all connected loads for at least 24 hours and then resumes normally scheduled operation.

(C) **Astronomical Time-Switch Controls.** Astronomical time-switch controls shall:

1. meet the requirements of an automatic time-switch control;

2. have sunrise and sunset prediction accuracy within plus-or-minus 15 minutes and timekeeping accuracy within 5 minutes per year;

3. be capable of displaying date, current time, sunrise time, sunset time, and switching times for each step during programming;

4. have an automatic daylight savings time adjustment; and

5. have the ability to independently offset the on and off for each channel by at least 99 minutes before and after sunrise or sunset.

(D) **Automatic Daylight Controls.** Automatic daylight controls shall:

1. be capable of reducing the power consumption in response to measured daylight either directly or by sending and receiving signals;

2. comply with ~~S~~section 1605.3(l)(2)(F) of this Article if the day lighting control is capable of directly dimming lamps;

3. automatically return to its most recent time delay settings within 60 minutes when put in calibration mode;

4. have a set point control that easily distinguishes settings to within 10 percent of full scale adjustment;

5. have a light sensor that has a linear response within 5 percent accuracy over the range of illuminance measured by the light sensor;

6. have a light sensor that is physically separated from where the calibration adjustments are made, or is capable of being calibrated in a manner that the person initiating the calibration is remote from the sensor during calibration to avoid influencing calibration accuracy; and

7. comply with ~~S~~section 1605.3(l)(2)(E) of this Article if the device contains a photo control component.

(E) **Photo Controls.**

Photo controls shall not have a mechanical device that permits disabling of the control.

(F) **Dimmer Controls.**

1. All dimmer controls shall:

   a. be capable of reducing power consumption by a minimum of 65 percent when the dimmer is at its lowest level;

   b. include an off position which produces a zero lumen output; and

   c. not consume more than 1 watt per lighting dimmer switch leg when in the off position.

2. Dimmer controls that can directly control lamps shall provide electrical outputs to lamps for reduced flicker operation through the dimming range so that the light output has an amplitude modulation of less than 30 percent for frequencies less than 200 Hz without causing premature lamp failure.

3. Wall box dimmers and associated switches designed for use in three way circuits shall be capable of turning lights off, and to the level set by the dimmer if the lights are off.

(G) **Occupant sensing devices.**

1. All occupant sensing devices shall:

   a. be capable of automatically turning off controlled lights in the area no more than 30 minutes after the area has been vacated;

   b. allow all lights to be manually turned off regardless of the status of occupancy; and

   c. have a visible status signal that indicates that the device is operating properly, or that it has failed or malfunctioned. The visible status signal may have an override switch that turns off the signal.

2. All occupant sensing devices that utilize ultrasonic radiation for detection of occupants shall:

   a. comply with 21 C.F.R. part 1002.12; and

b. emit no audible sound, and shall not emit ultrasound in excess of the decibel levels shown in Table L-~~1~~ measured no more than five feet from the source, on axis.

Table L-~~1~~
Ultrasound Maximum Decibel Values

Mid-frequency of Sound Pressure Third-Octave Band (in kHz)	***Maximum db Level within third-Octave Band (in dB reference 20 micropascals)***
Less than 20	80
20 or more to less than 25	105
25 or more to less than 31.5	110
31.5 or more	115

3. All occupant sensing devices that utilize microwave radiation for detection of occupants shall:

   a. comply with 47 C.F.R. parts 2 and 15; and

   b. not emit radiation in excess of 1 milliwatt per square centimeter measured at no more than 5 centimeters from the emission surface of the device.

4. Occupant sensing devices incorporating dimming shall comply with the requirements for dimmer controls in ~~S~~section 1605.3(l)(2)(F) of this Article.

5. Motion sensors shall be rated for outdoor use as specified by the National Electrical Code 2002, Section 410.4(A).

6. "Partial off" shall have dimming functionality or shall incorporate the following functionalities:

   a. have two poles;

   b. have one pole that is manual-on and manual off; and

   c. have one pole that is automatic-on and automatic-off and shall not be capable of conversion by the user to manual-on only functionality.

7. "Partial on" shall have dimming functionality or shall incorporate the following functionalities:

   a. have two poles each with automatic-off functionality;

   b. have one pole that is manual-on and shall not incorporate DIP switches, or other manual means, for conversion between manual and automatic functionality; and

   c. have one pole that is automatic-on and shall not be capable of conversion by the user to manual-on functionality.

8. Vacancy sensors shall:

   a. not turn on lighting automatically and shall not incorporate DIP switches, or other manual means, for conversion between manual and automatic functionality;

   b. have a grace period of no more than 30 seconds and no less than 15 seconds to turn on lighting automatically after the sensor has timed out; and

c. not have an override switch that disables the sensor.

(m) Traffic Signal Modules ~~and Traffic Signal Lamps~~.

(1) **Traffic Signal Modules for Pedestrian Control.** The power consumption of traffic signal modules for pedestrian control manufactured on or after January 1, 2006 shall be not greater than the applicable values shown in Table M-2 when tested at the temperatures shown.

Table M-2
Standards for Traffic Signal Modules for Pedestrian Control
Sold or Offered for Sale in California

Type	*at 25°C (77°F)*	*At 74°C (165.2°F)*
Hand or 'Don't Walk' sign or countdown.	10 watts	12 watts
Walking Person or 'Walk' sign	9 watts	12 watts

(2) See ~~S~~section 1605.1(m) of this Article for energy efficiency standards for federally regulated traffic signal modules for vehicle control and federally regulated traffic signal modules for pedestrian control.

(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 ~~S~~section 1605.3(n)(1)(A) of this Article as applicable:

(A) The requirements for metal halide luminaires are as follows:

1. Indoor metal halide luminaires manufactured on or after January 1, 2010 shall comply with at least one compliance option of ~~S~~section 1605.3(n)(1)(B) of this Article.

2. Indoor metal halide luminaires manufactured on or after January 1, 2015 shall comply with ~~S~~section 1605.3(n)(1)(B)4 of this Article, and shall also comply with at least one other compliance option of ~~S~~section 1605.3(n)(1)(B) of this Article.

3. Outdoor metal halide luminaires manufactured on or after January 1, 2010, may comply with ~~S~~section 1605.3(n)(1)(B)3 of this Article, and shall comply with at least one other compliance option of ~~S~~section 1605.3(n)(1)(B) of this Article.

(B) Metal halide luminaires shall meet one of the following compliance options:

1. A minimum ballast efficiency of:

~~i~~a. 90 percent for 150 to 250 watt lamps; or

~~ii~~b. 92 percent for 251 to 500 watt lamps.

2. A minimum ballast efficiency of 88 percent and an occupant sensor which is an integral control as defined in ~~S~~section 1602(n) of this Article, shipped with the factory default setting to automatically reduce lamp power through dimming by a minimum of 40 percent within 30 minutes or less after an area has been vacated;

3. A minimum ballast efficiency of 88 percent and an automatic daylight control which is an integral control as defined in ~~S~~section 1602(n) of this Article, shipped with the factory

default setting to automatically reduce lamp power through dimming by a minimum of 40 percent;

4. A minimum ballast efficiency of 88 percent and a relamping rated wattage within only one of the four wattage bins specified in subsections ~~(i)~~(a) through~~(iv)~~(d) below. The luminaire shall be able to operate lamps within only one of the four wattage bins and shall not be rated for any lamp wattage outside of that wattage bin. The luminaire shall have a permanent, pre-printed factory-installed label that states the relamping rated wattage.

   ~~i~~a. 150-160 watts; or

   ~~ii~~b. 200-215 watts; or

   ~~iii~~c. 290-335 watts

   ~~iv~~d. 336-500 watts, provided that when a luminaire is able to operate 336 to 500 watt lamps, the luminaire shall be prepackaged and sold together with at least one lamp per socket, having a minimum lamp mean efficacy of 80 lumens per watt based on published mean lumens and rated lamp power (watts).

(C) **Federally Regulated Metal Halide Luminaires.** See section 1605.1(n) of this Article for energy efficiency standards for metal halide luminaries rated under 150 W and above 500 W.

EXCEPTIONS to ~~S~~sections 1605.3(n)(1) of this Article: The following metal halide lighting systems shall not have probe-start ballasts and are not required to meet the minimum ballast efficiency requirements:

1. Luminaires that use regulated lag ballasts;

2. Luminaires that use electronic ballasts which operate at 480 volts; or

3. Luminaires that meet all three of the following requirements:

   a. Are rated for use only with 150 watt lamps, and

   b. Are rated for use in wet locations, as specified by the National Electrical Code 2002, Section 410.4(A); and

   c. Contain a ballast that is rated to operate at ambient air temperatures above 50 ~~degrees~~ °C, as specified by UL 1029-2001.

(2) **Energy Efficiency Standards for Under-Cabinet Luminaires.** Under-cabinet luminaires that are equipped with T-8 fluorescent lamps and that are designed to be attached to office furniture and that are manufactured on or after January 1, 2006 shall be equipped with ballasts that have a ballast efficacy factor not less than the applicable values shown in Table N-~~1~~2.

Under-cabinet luminaires that are equipped with ~~GU-24~~GU24 sockets manufactured on or after January 1, 2010 shall not be rated for use with incandescent lamps of any type, including line voltage or low voltage.

Exception 1 to ~~S~~section 1605.3(n)(2) of this Article:

Section 1605.3(n)(~~3~~2) of this Article does not apply to luminaires equipped with T-8 ballasts designed for dimming.

Exception 2 to ~~S~~section 1605.3(n)(2) of this Article:

Section 1605.3(n)(2) of this Article does not apply to luminaires that are:

(a) specifically and exclusively designed for use in applications where electromagnetic interference from electronic ballasts would interfere with critical, sensitive instrumentation and equipment such as medical imaging devices; and

(b) clearly, legibly, and permanently labeled, in at least 12 point type and in a place likely to be seen by the purchaser and the installer, “This 'luminaire' or 'fixture' is intended exclusively for use in applications where critical, sensitive equipment would be adversely affected by electronic lamp ballast electromagnetic radiation”.

Table N-~~1~~2
Standards for Under-Cabinet Luminaires

Lamp Length (inches)	*Minimum Ballast Efficacy Factor (BEF) for one lamp*	*Minimum Ballast Efficacy Factor (BEF) for two lamps*
≤29	4.70	2.80
>29 and ≤35	3.95	2.30
>35 and ≤41	3.40	1.90
>41 and ≤47	3.05	1.65
>47	2.80	1.45

(3) **Portable Luminaires.**

(A) Portable luminaires manufactured on or after January 1, 2010 shall meet one or more of the following requirements:

1. Be equipped with a dedicated fluorescent lamp socket connected to a high frequency electronic ballast contained within the portable luminaire;

2. Be equipped with one or more ~~GU-24~~GU24 line-voltage sockets and not rated for use with incandescent lamps of any type, including line voltage or low voltage;

3. Be an LED luminaire or a portable luminaire with an LED light engine with integral heat sink, and comply with the minimum requirements shown in Table N-~~2~~3;

Table N-~~2~~3
Minimum Requirements for Portable LED Luminaires,
and Portable Luminaires with LED Light Engines with Integral Heat Sink

Criteria	*Requirement*
Light Output	≥ 200 lumens (initial)
Minimum LED Luminaire Efficacy	29 lumens/W
Minimum LED Light Engine Efficacy	40 lumens/W
~~Color~~ Correlated Color Temperature (CCT)	2700-K through 5000-K
Minimum Color Rendering Index (CRI)	75
Power Factor (for luminaires labeled or sold for residential use)	≥ 0.70

4. Be equipped with an E12, E17, or E26 screw-based socket and be prepackaged and sold together with one screw-based compact fluorescent lamp or screw-based LED lamp for each screw-based socket on the portable luminaire. The compact fluorescent or LED lamps which are prepackaged with the portable luminaire shall be fully compatible with the luminaire controls, meaning that portable luminaires having a dimmer control shall be prepackaged with dimmable compact fluorescent or LED lamps, and portable luminaires having 3-way controls shall be prepackaged with 3-way compact fluorescent or LED lamps. The compact fluorescent lamps which are prepackaged with the luminaires shall also meet the minimum energy efficiency levels established by ENERGY STAR® for compact fluorescent lamps in effect on December 31, 2008. The LED lamps required to be packaged with the luminaire shall comply with the minimum requirements for state-regulated LED lamps in sections 1601 through 1607 of this ~~article~~Article;

5. Be equipped with one or more single-ended, non-screw based halogen lamp sockets (line or low voltage), a dimmer control or high low control, and be rated for a maximum of 100W.

EXCEPTIONS to Section 1605.3(n)(3) of this Article. The following portable luminaires are not required to be prepackaged and sold together with compact fluorescent or LED lamps:

1. **Portable Wall Mount Adjustable Luminaires that meet all of the following requirements:** Designed only to be mounted on a wall, having no base which will allow the luminaire to stand on a horizontal surface, having an articulated arm, having a maximum overall length of 24 inches in any direction, fitted only with a single ~~E-12~~E12, ~~E-17~~E17 or ~~E-26~~E26 lamp socket per luminaire, and controlled with an integral dimmer. Luminaires manufactured on or before December 31, 2011 shall have a maximum relamping rated wattage of 57 watts, and luminaires manufactured on or after January 1, 2012 shall have a maximum relamping rated wattage of 43 watts, as listed on a

permanent pre-printed factory-installed label in accordance with Underwriters Laboratories (UL) 153.

2. **Art Work Luminaires that meet all of the following requirements:** Designed only to be mounted directly to art work only for the purpose of illuminating that art work, fitted only with ~~E-12~~E12 screw-base line-voltage sockets, having no more than three sockets per luminaire, and controlled with an integral high/low switch. Luminaires with a single socket shall have a maximum relamping rated wattage of 25 watts, and luminaires with two or three sockets shall have a maximum relamping rated wattage of 15 watts per socket, as listed on a permanent pre-printed factory-installed label in accordance with Underwriters Laboratories (UL) 153.

(B) Portable luminaires that have internal power supplies shall have zero standby power when the luminaire is turned off.

(4) **~~GU-24~~GU24 adaptors.** ~~GU-24~~GU24 adaptors manufactured on or after January 1, 2010 shall not adapt a ~~GU-24~~GU24 socket to any other line voltage socket.

(5) See ~~S~~section 1605.1(n) of this Article for energy efficiency standards for federally regulated metal halide lamp fixtures manufactured on or after January 1, 2009, and torchieres.

(o) Dishwashers.

See ~~S~~section 1605.1(o) of this Article for energy efficiency standards for dishwashers that are federally- regulated consumer products.

(p) Clothes Washers.

Energy Efficiency and Water Efficiency Standards for Residential and Commercial Clothes Washers. See section 1605.1(p) of this Article for energy efficiency and water efficiency standards for residential and commercial clothes washers.

~~(1) **Commercial Clothes Washers.** See Section 1605.1(p) for energy efficiency standards and water efficiency standards for commercial clothes washers.~~

~~(2) **Other Clothes Washers.** See Section 1605.1(p) and 1605.2(p) for energy efficiency standards and energy design standards for clothes washers that are federally-regulated consumer products.~~

(q) Clothes Dryers.

See ~~S~~section 1605.1(q) of this Article for energy efficiency standards and energy design standards for clothes dryers that are federally- regulated consumer products.

(r) Cooking Products and Food Service Equipment.

(1) **Energy Standards for Food Service Equipment.** There is no energy efficiency standard or energy design standard for food service equipment other than commercial hot food holding cabinets.

(2) **Energy Efficiency Standards for Commercial Hot Food Holding Cabinets.** The idle energy rate of commercial hot food holding cabinets manufactured on or after January 1, 2006 shall be no greater than 40 watts per ~~cubic feet~~ft3 of measured interior volume.

(3) **Cooking Products.** See ~~S~~section 1605.1(r) of this Article for energy efficiency standards and energy design standards for cooking products that are federally- regulated consumer products.

(s) Electric Motors and Compressors.

(1) **Electric Motors.** See ~~S~~section 1605.1(s) of this Article for energy efficiency standards for electric motors that are federally- regulated commercial and industrial equipment.

(2) **Compressors.** There are no energy efficiency standards for federally regulated compressors.

(t) Distribution Transformers.

See ~~S~~section 1605.1(t) of this Article for energy efficiency standards for low-voltage dry-type distribution transformers, liquid-immersed distribution transformers, and medium-voltage dry-type distribution transformers.

(u) External Power Supplies.

(1) The efficiency in the active mode of state-regulated external power supplies, manufactured on or after the effective dates shown when tested at 115 volts at 60 Hz, shall be not less than the applicable values shown (expressed as the decimal equivalent of a percentage); and the energy consumption in the no-load mode of power supplies manufactured on or after the effective dates when tested at 115 volts at 60 Hz, shown shall be not greater than the applicable values shown in ~~Table U-3 and~~ Table U-4.

~~**EXCEPTION to Section 1605.3(u):** A power supply that is made available by a manufacturer directly to a consumer or to a service or repair facility after and separate from the original sale of the product requiring the power supply as a service part, or spare part shall not be required to meet the Standards for Power Supplies in Table U-3 and Table U-4 until five years after the effective dates indicated in Table U-3 and Table U-4.~~

~~**Table U-3**~~
~~**Standards for State-Regulated External Power Supplies**~~
~~**Effective January 1, 2007 for external power supplies used with laptop computers, mobile phones, printers, print servers, scanners, personal digital assistants (PDAs), and digital cameras.**~~
~~**Effective July 1, 2007 for external power supplies used with wireline telephones and all other applications.**~~

~~*Nameplate Output*~~	~~*Minimum Efficiency in Active Mode*~~
~~0 to < 1 watt~~	~~0.49 * Nameplate Output~~
~~≥ 1 and ≤ 49 watts~~	~~0.09 * Ln(Nameplate Output) + 0.49~~
~~> 49 watts~~	~~0.84~~

	~~*Maximum Energy Consumption in No-Load Mode*~~
~~0 to <10 watts~~	~~0.5 watts~~
~~≥ 10 to ≤ 250 watts~~	~~0.75 watts~~
~~Where Ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.~~	

Table U-4
Standards for State-Regulated External Power Supplies
Effective July 1, 2008

Nameplate Output	***Minimum Efficiency in Active Mode***
<1 watt	0.5 * Nameplate Output
≥ 1 and ≤ 51 watts	0.09*Ln(Nameplate Output) + 0.5
> 51 watts	0.85
	Maximum Energy Consumption in No-Load Mode
Any output	0.5 watts
Where Ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.	

(2) See section 1605.1(u) of this Article for energy efficiency standards for federally regulated external power supplies.

(v) Computers, Computer Monitors, Televisions, Signage Displays, and Consumer Audio and Video Equipment.

(1) **Consumer Audio and Video Equipment.** The power usage of consumer audio and video equipment manufactured on or after the effective dates shown shall be not greater than the applicable values shown in Table V-2. For equipment that consists of more than one individually powered product, each with a separate main plug, the individually powered products shall each have a power usage not greater than the applicable values shown in Table V-2.

Table V-2
Standards for Consumer Audio and Video Equipment

Appliance Type	***Effective Date***	***Maximum Power Usage (Watts)***
Compact Audio Products	January 1, 2007	2 W in Audio standby-passive mode for those without a permanently illuminated clock display 4 W in Audio standby-passive mode for those with a permanently illuminated clock display
Digital Versatile Disc Players and Digital Versatile Disc Recorders	January 1, 2006	3 W in Video standby-passive mode

(2) **Televisions and Signage Displays.** All televisions and signage displays manufactured on or after the effective dates shall meet the requirements shown in Table V-3.

(3) **Televisions and Signage Displays Manufactured On or After January 1, 2011.** In addition, televisions and signage displays manufactured on or after January 1, 2011 shall meet the requirements shown in ~~S~~sections 1605.3(v)(3)(A), ~~and~~ 1605.3(v)(3)(B), and 1605.3(v)(3)(C) of this Article.

(A) A television or signage display shall automatically enter TV standby-passive mode or standby-active mode after a maximum of 15 minutes without video or audio input on the selected input mode.

(B) A television or signage display shall enter TV standby-passive mode when turned off by remote or integrated button/switch.

(C) The peak luminance of the product in "home" mode, or in the default mode as shipped, shall not be less than 65% of the peak luminance of the "retail" mode, or the brightest selectable preset mode, of the product.

Table V-3
Standards for Televisions and Signage Displays

Effective Date	*Screen Size (area A in square inches)*	*Maximum TV and Signage Display Standby-passive Mode Power Usage (watts)*	*Maximum On Mode Power Usage (P in Watts)*	*Minimum Power Factor for (P ≥ 100W)*
January 1, 2006	All	3 W	No standard	No standard
January 1, 2013	A < 1400	1 W	P ≤ 0.12 x A + 25	0.9

~~(D)~~ **EXCEPTIONS to Sections 1605.3(v)(2) and 1605.3(v)(3):** ~~1.~~ The standards found in sections 1605.3(v)(2) and 1605.3(v)(3) of this Article do not apply to p~~P~~rofessional signage displays.

(4) **Computer monitors.** Computer monitors manufactured on or after July 1, 2019, shall comply with all of the following:

(A) The computer monitor on-mode power draw shall be less than or equal to the following equation with each of the applicable allowances applied at most once:

$$E_{on} \leq (E_{on\_max} + E_{EP} + E_{Game} + E_{OLED} + E_{Curve})$$

Where:
E_{on} is the computer monitor on-mode power draw in watts as determined under ~~S~~section 1604(v)(~~4~~3) of this Article,
E_{on_max} is the maximum on-mode power draw in watts as determined by Table V-4,
E_{EP} is the enhanced performance display allowance in watts as determined in Table V-5,
E_{Game} is the gaming monitor allowance in watts as determined in Table V-5,
E_{OLED} is the OLED monitor allowance in watts as determined in Table V-5, and
E_{Curve} is the curved monitor allowance in watts as determined in Table V-5.

(B) Consume less than or equal to 1.2 watts in computer monitor sleep mode and computer monitor off mode power combined.

(C) Be shipped with a screen luminance less than or equal to 200 cd/m2 ± 35 percent. A manufacturer may ship with additional features enabled, even if they were turned off in testing.

(D) Computer monitors with touch screen capability are allowed an additional 1 watt allowance per mode in modes where touch functionality is enabled.

Table V-4
Power Consumption Standards for Computer Monitors

Resolution in	*Diagonal Screen*	*Maximum Computer Monitor On Mode*

megapixels (MP)	*Size (d) in Inches*	*Power Consumption in Watts*
≤ 5.0 MP	17" ≤ d ≤ 20"	[(6.0*r) + (0.025*A) + 3.7]
	20" < d < 23"	[(4.2*r) + (0.02*A) + 2.2]
	23" ≤ d < 25"	[(4.2*r) + (0.04*A) – 2.4]
	25" ≤ d < 30"	[(4.2*r) + (0.07*A) – 10.2]
	30" ≤ d ≤ 61"	[(6.0*r) + (0.1*A) – 14.5]
> 5.0 MP	17" ≤ d ≤ 20"	[25 + (0.025*A) + 3.7]
	20" < d < 23"	[25 + (0.02*A) + 2.2]
	23" ≤ d < 25"	[25 + (0.04*A) – 2.4]
	25" ≤ d < 30"	[25 + (0.07*A) – 10.2]
	30" ≤ d ≤ 61"	[25 + (0.1*A) – 14.5]
Where: "A" is the monitor screen area in square inches "d" is the diagonal measurement of the display in inches "r" is the megapixel resolution of the display		

Table V-5
List of Potentially Applicable Allowances

Allowance	*Computer Monitor Type*	*Models manufactured on or after July 1, 2019, and before January 1, 2021*	*Models manufactured on or after January 1, 2021*
EEP	Enhanced Performance Display with a color gamut support of 32.9% of CIELUV or greater (99% or more of defined sRGB colors)	.3 * Eon_max	.2 * Eon_max
	Enhanced Performance Display with a color gamut support of 38.4% of CIELUV or greater (99% or more of defined Adobe RFB colors)	.75 * Eon_max	.6 * Eon_max
EGame	Gaming Monitors without incremental hardware-based assistance	.3 * Eon_max	.2 * Eon_max
	Gaming Monitors with incremental hardware-based assistance	.35 * Eon_max	.3 * Eon-max
EOLED	OLED monitor	.3 * Eon_max	.2 * Eon_max
ECurve	Curved Monitor	.3 * Eon_max	.2 * Eon_max

~~(E)~~ **EXCEPTIONS to Section 1605.3(v)(4):** The following computer monitors are not required to comply with ~~S~~section 1605.3(v)(4) of this Article but shall comply with the test procedures in ~~S~~section 1604(v)(~~4~~3) of this Article , the certification requirements in ~~S~~section 1606 of this Article , and the marking requirements in ~~S~~section 1607 of this Article:

1. KVMs.
2. KMMs.
3. Very high performance monitors.

~~(F)~~ **EXCEPTION to Section 1605.3(v)(4):** Medical computer monitors are not required to comply with ~~S~~section 1605.3(v)(4) of this Article or the test procedures in ~~S~~section

1604(v)(~~4~~3) of this Article but shall comply with the certification requirements in ~~S~~section 1606 of this Article and the marking requirements in ~~S~~section 1607 of this Article.

(5) **Desktop computers, thin clients, mobile gaming systems, portable all-in-ones, and notebook computers.** Desktop computers, thin clients, mobile gaming systems, portable all-in-ones, and notebook computers manufactured on or after January 1, 2019, shall:
(A) Comply with Table V-7; and
(B) Be shipped with power management settings that do both of the following:
1. Transition the computer into either the computer sleep mode or computer off mode measured in ~~S~~section 1604(v)(5) of this Article within 30 minutes of user inactivity. If the transition is to a computer sleep mode, that sleep mode shall either:
a. Be a computer sleep mode as described in ACPI as S3; or
b. Consume power less than or equal to the values shown in Table V-6.
2. Transition connected displays into sleep mode within 15 minutes of user inactivity.

~~(C)~~ **EXCEPTION to Section 1605.3(v)(5)(B).** If the model is shipped at the purchaser's request with either a limited capability operating system or without an operating system, or if the model is not capable of having an operating system, the model is not required to comply with ~~S~~section 1605.3(v)(5)(B) of this Article.

~~(D)~~ **EXCEPTION to Section 1605.3(v)(5)(A).** Desktop computers and thin clients assembled before July 1, 2021, entirely from parts manufactured before September 1, 2018, are not required to comply with ~~S~~section 1605.3(v)(5)(A) of this Article.

Table V-6
Alternative Computer Sleep Mode Power Limits

Computer Type	***Maximum Power Consumption (watts)***
Workstations, Mobile Workstations, High Expandability computers~~, Small-Scale Servers~~	10 + 0.03 * C where C is the system memory capacity in gigabytes minus 32 gigabytes. If C is less than zero, use zero for the value of C.
Desktop Computers, Thin Clients, Mobile Gaming Systems	5 + 0.03 * C where C is the system memory capacity in gigabytes minus 32 gigabytes. If C is less than zero, use zero for the value of C.
Notebook Computers, Portable All-In-Ones	2.5 + 0.03 * C where C is the system memory capacity in gigabytes minus 16 gigabytes. If C is less than zero, use zero for the value of C. If a discrete GPU is present in the system, the maximum power consumption limit shall be increased by an additional 2 watts.

Table V-7
Energy Consumption Standards for Desktop Computers, Thin Clients, Notebook Computers, Mobile Gaming Systems, and Portable All-in-Ones

Computer Type	***For models manufactured on or after January 1, 2019, and before July 1, 2021, the measured annual energy consumption shall be less than or equal to the values below***	***For models manufactured on or after July 1, 2021, the measured annual energy consumption shall be less than or equal to the values below***
Desktop Computers, mobile gaming systems, and thin clients with an ES of 250 or less	50 kWh/yr + applicable adders in Table V-8	50 kWh/yr + applicable adders in Table V-8
Desktop Computers, mobile gaming systems, and thin clients with an ES of more than 250 but no more than 425	80 kWh/yr + applicable adders in Table V-8	60 kWh/yr + applicable adders in Table V-8
Desktop Computers, mobile gaming systems, and thin clients with an ES of more than 425 but no more than 690	100 kWh/yr + applicable adders in Table V-8	75 kWh/yr + applicable adders in Table V-8
Notebook computers and portable all-in-ones	30 kWh/yr + applicable adders in Table V-8	30 kWh/yr + applicable adders in Table V-8
Minimum power factor of a computer power supply that is not a federally-regulated external power supply	0.9 measured at full load	0.9 measured at full load

Table V-8
List of Potentially Applicable Adders

Function	***Desktop Computer, Mobile Gaming System, and Thin Client Adder (kWh/yr.)***	***Notebook Computers and Portable All-In-One Adder (kWh/yr.)***
System Memory	4 + 0 .15 * C Where C is the capacity in GB.	4 + 0.15 * C Where C is the capacity in GB.
Energy-Efficient Ethernet	0.9 per computer	0.9 per computer
Storage device other than main storage device	3.5-inch Drive: 26 2.5-inch Drive: 4.5 Solid-State Drive (SSD): 0.5 Solid-State Hybrid Drive (SSHD): 1.0 Other: 26 per storage device	2.6 per storage device
Integrated Display Where: “d" is the diagonal measurement of the display in inches. "r" is the megapixel resolution of the display. "A" is the viewable screen area in square inches. EP=0 for displays that are not enhanced performance displays	For d ≤ 20: (8.76*0.35*(1 +EP)*[(4.2*r)+5.7])*0.8 For 20 < d < 23: (8.76*0.35*(1+EP)*[(4.2*r)+(0.02*A)+ 2.2])*0.8 For 23 ≤ d < 25: (8.76*0.35*(1+EP)* [(4.2*r)+(0.04*A)-2.4])*0.8	8.76*0.3*(1+EP)*[(0 .43*r)+(0.0263*A)] r=6 for resolutions greater than 6 megapixels. EP=0.4 for displays with a color gamut

	For 25 ≤ d: (8.76*0.35*(1 +EP)* [(4.2*r)+(0.07*A)-10.2])*0.8 r=6 for resolutions greater than 6 megapixels. Before July 1, 2021: EP=0.3 for displays with a color gamut support of 32.9% of CIELUV or greater (99% or more of defined sRGB colors); and EP=0.75 for displays with a color gamut support of 38.4% of CIELUV or greater (99% or more of defined Adobe RGB colors). On or after July 1, 2021: EP=0.2 for displays with a color gamut support of 32.9% of CIELUV or greater (99% or more of defined sRGB colors); and EP=0.6 for displays with a color gamut support of 38.4% of CIELUV or greater (99% or more of defined Adobe RGB colors).	support of38.4% of CIELUV or greater (99% or more of defined Adobe RGB colors).
First Discrete GPU that is not packaged on the same substrate as the CPU (on or after January 1,2019 and before July 1, 2021) Where "B" is frame buffer bandwidth measured in GB/s	58.6*tanh(0.0038*B-0.137)+26.8	29.3*tanh(0.0038*B-0.137)+13.4
First Discrete GPU that is not packaged on the same substrate as the CPU (on or after July 1, 2021) Where "B" is frame buffer bandwidth measured in GB/s	29.4*tanh(0.008*B-0.03)+11+(0.011*B)	14.7*tanh(0.008*B-0.03)+5.5+(0.0055*B)
First Discrete GPU that is packaged on the same substrate as the CPU (on or after January 1, 2019) Where “B” is frame buffer bandwidth measured in GB/s	29.4*tanh(0.008*B-0.03)+11+(0.011*B)	14.7*tanh(0.008*B-0.03)+5.5+(0.0055*B)
Additional Discrete GPU	11 per GPU	5.5 per GPU
Add-in Cards This adder does not apply if either of the following criteria is met: An adder is claimed for a device connected through this add-in card; or An interface score from Table V-1 applies to a slot or interface provided by this add-in card.	10 per card	5 per card
Video Surveillance Card	25 per card	12.5 per card
Wired Ethernet or Fiber Card with a transmit rate of 10 Gb/s or greater	25 per card	12.5 per card
High bandwidth system memory Where "S" is system memory bandwidth	22.78*tanh[0.006*(S-70)+0.15]-12.33	9.11*tanh[0.006*(S-70)+0.15]-4.45

measured in GB/s. This adder does not apply to a computer that meets any of the following criteria: Expandability score includes a credit for 4-channel memory. System memory bandwidth is less than 146 GB/s. Less than 4 GB of the system memory has a bandwidth of 146 GB/s or more and either: Has an integrated display with a resolution of 9 megapixels or less; or Does not have an integrated display Uses an adder for a first discrete GPU		

(6) **Small-scale servers, high expandability computers, mobile workstations, and workstations.** Small-scale servers, high expandability computers, mobile workstations, and workstations manufactured on or after January 1, 2018, shall:
(A) Be powered by an internal power supply that meets or exceeds the standards in Table V-9, or an external power supply that meets the level VI of efficiency described in the International Efficiency Marking Protocol for External Power Supplies Version 3.0 (Sept. 2013);
(B) Incorporate Energy-Efficient Ethernet functionality;
(C) Transition connected displays into sleep mode within 15 minutes of user inactivity; and
(D) Transition the computer into either the computer sleep mode or computer off mode measured in ~~S~~section 1604(v)(~~5~~4) of this Article within 30 minutes of user inactivity. If the transition is to a computer sleep mode, that sleep mode shall either:
1. Be a computer sleep mode as described in ACPI as S3; or
2. Consume power less than or equal to the values shown in Table V-6.

EXCEPTION to Section 1605.3(v)(6)(D): Small-scale servers and rack-mounted workstations are not required to comply with ~~S~~section 1605.3(v)(6)(D) of this Article.

Table V-9
Internal Power Supply Requirements

115V Power Supplies				
10% Load	***20% Load***	***50% Load***	***100% Load***	***Power Factor Correction***
-	87%	90%	87%	0.9 at 50% load
230V Power Supplies				
10% Load	***20% Load***	***50% Load***	***100% Load***	***Power Factor Correction***
-	88%	92%	88%	0.9 at 50% load

(7) **Small volume manufacturers.**
(A) Computers manufactured on or after January 1, 2019, by a small volume manufacturer shall:
1. Comply with the power management settings identified in ~~S~~sections 1605.3(v)(5)(B)~~(2)~~. and 1605.3(v)(6)(C) of this Article;
2. Be shipped with power management settings that transition the computer into either computer sleep mode or computer off mode within 30 minutes of user inactivity; and

3. Be exempt from all other requirements for computers unless the small volume manufacturer meets the criteria in ~~S~~section 1605.3(v)(7)(C) of this Article.

(B) Small-scale servers and rack-mounted workstations are not required to comply with ~~S~~section 1605.3(v)(7)(A)~~(2)~~.

(C) If a small volume manufacturer produces desktop or workstation computers in quantities of more than 50 units of a basic model, the manufacturer shall certify those units as meeting the requirements in ~~S~~sections 1603, 1604(v)(~~5~~4), 1605.3(v)(5) or 1605.3(v)(6), 1606, and 1607 of this Article.

(w) Battery Chargers and Battery Charger Systems.

(1) **Energy Efficiency Standards for Large Battery Charger Systems**. Large battery charger systems manufactured on or after January 1, 2014, and that are not federally regulated battery chargers, shall meet the applicable performance values in Table W-~~1~~2.

Table W-~~1~~2
Standards for Large Battery Charger Systems

Performance Parameter		***Standard***
Charge Return Factor (CRF)	100 percent, 80 percent Depth of discharge	CRF≤ 1.10
	40 percent Depth of discharge	CRF ≤ 1.15
Power Conversion Efficiency		Greater than or equal to: 89 percent
Power Factor		Greater than or equal to: 0.90
Maintenance Mode Power (E_b = battery capacity of tested battery)		Less than or equal to: 10 + 0.0012E_b W
No Battery Mode Power		Less than or equal to: 10 W

(2) **Energy Efficiency Standards for Small Battery Charger Systems.** Except as provided in sections 1605.3(w)(3), 1605.3(w)(4), and 1605.3(w)(5) ~~1605.3(w)(2)(D)~~ of this Article, the following small battery charger systems shall meet the applicable performance values in Table W-2:

(A) consumer products that are manufactured on or after February 1, 2013 and before June 13, 2018~~, except for USB charger systems that have a battery capacity of 20 watt-hours or more and are manufactured before January 1, 2014~~; and

(B) ~~consumer products that are USB charger systems with a battery capacity of 20 watt-hours or more and are manufactured on or after January 1, 2014; and~~

~~(C)~~ those that are not consumer products and are manufactured on or after January 1, 2017.

EXCEPTION to Section 1605.3(w)(2) of this Article: An à la carte charger that is :

a. provided separately from and subsequent to the sale of small battery charger system manufactured before the effective date of the applicable standard in ~~S~~section 1605.3(w)(2) of this Article;

b. necessary as a replacement for, or as a replacement component of, such small battery charger system;

c. is provided by a manufacturer directly to a consumer or to a service or repair facility; and

d. is manufactured no more than five years after the effective date in ~~S~~section 1605.3(w)(2) of this Article applicable to the particular small battery charger system for which the à la carte charger is intended as a replacement or replacement component,

shall not be required to meet the applicable standard in ~~S~~section 1605.3(w)(2) and Table W-~~2~~3 of this Article.

Table W-~~2~~3
Standards for Small Battery Charger Systems

Performance Parameter	***Standard***
Maximum 24 hour charge and maintenance energy (Wh) (E_b = capacity of all batteries in ports and N = number of charger ports)	For E_b of 2.5 Wh or less: 16 × N
	For E_b greater than 2.5 Wh and less than or equal to 100 Wh: 12 x N +1.6E_b
	For E_b greater than 100 Wh and less than or equal to 1000 Wh: 22 x N+1.5E_b
	For E_b greater than 1000 Wh: 36.4 x N +1.486E_b
Maintenance Mode Power and No Battery Mode Power (W) (E_b = capacity of all batteries in ports and N = number of charger ports)	The sum of maintenance mode power and no battery mode power must be less than or equal to: 1x N+0.0021xE_b Watts

(3) **Inductive Charger Systems.** Inductive charger systems manufactured on or after February 1, 2013 and before June 13, 2018 and inductive charger systems that are not federally regulated battery chargers and manufactured on or after February 1, 2013, shall meet either the applicable performance standards in Table W-2 or shall use less than 1 watt in maintenance mode, less than 1 watt in no battery mode, and an average of 1 watt or less over the duration of the charge and maintenance mode test.

(4) **Battery Backup and Non-Federally Regulated Uninterruptible Power Supplies.** Battery backup and non-federally regulated uninterruptible power supplies that are manufactured on or after:
(A) February 1, 2013, for consumer products; and
(B) January 1, 2017, for products that are not consumer products

shall consume no more than 0.8+0.0021 x E_b watts in maintenance mode where E_b is the battery capacity in watt-hours.

(5) Standards for Federally Regulated Battery Chargers Manufactured on or After June 13, 2018. See section 1605.1(w) of this Article for standards for federally regulated battery chargers manufactured on or after June 13, 2018.

The following documents are incorporated by reference in ~~S~~section 1605.3.

Number ***Title***

FEDERAL REQUIREMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) Version 1.1 (August 2014)

EPA ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) Version 2.0 (December 2015)

EPA ENERGY STAR® Program Requirements for CFLs (December 2008)

Copies available from:	US EPA Climate Protection Partnership ENERGY STAR® Programs Hotline & Distribution (MS-6202J) 1200 Pennsylvania Ave NW Washington, DC 20460 www.energystar.gov
~~Copies available from:~~	~~Superintendent of Documents~~ ~~U.S. Government Printing Office~~ ~~Washington, DC 20402~~ ~~http://ecfr.gpoaccess.gov/~~

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

~~ANSI C81.61-2006~~	~~Specifications for Electric Bases~~
ANSI C78.377-2015	American National Standard for Electric Lamps – Specifications for the Chromaticity of Solid State Lighting (SSL) Products
Copies available from:	American National Standards Institute 1819 L Street, NW, 6th Floor Washington, DC 20036 www.ansi.org Phone: (202) 293-8020 FAX: (202) 293-9287

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A112.19.2/CSA B45.1-2013 Waste Extraction Test (Section 7.10)	Ceramic Plumbing Fixtures
Copies available from:	ASME Headquarters Two Park Avenue New York, NY 10016-5990 www.asme.org Phone: 800-843-2762 (U.S./Canada) 001-800-843-2763 (Mexico) 973-882-1170 (outside North America) Email: CustomerCare@asme.org

UNDERWRITERS LABS (UL)

UL 153	Portable Luminaires
UL 1029-2001	Standard for High-Intensity-Discharge Lamp Ballasts

Copies available from:

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096
www.ul.com
Phone: (847) 272-8800
FAX: (847) 272-8129

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1606. Filing by Manufacturers; Listing of Appliances in ~~Database~~the MAEDbS.

(a) Filing of Statements.

Each manufacturer shall electronically file with the Executive Director through the MAEDbS a statement for each appliance that is sold or offered for sale in California. The statement shall contain all of the information described in paragraphs (2) through (4) of this subsection and shall meet all of the requirements of paragraph (1) of this subsection and all other applicable requirements in this Article.

The effective dates of this section shall be the same as the effective dates shown in ~~S~~section 1605.1, 1605.2 or 1605.3 of this Article for appliances for which there is an energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article. For appliances with no energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the effective date of this section shall be one year after they are added to ~~S~~section 1601 of this Article, unless a different effective date is specified.

Exceptions to Section 1606(a) of this Article: Section 1606(a) of this Article is not applicable to:

1. external power supplies,

~~2. walk-in coolers and walk-in freezers,~~

~~3. low-profile ceiling fans, or~~

2. compressors,

3. small electric motors, or

4. à la carte chargers meeting the EXCEPTION noted in ~~S~~section 1605.3(w)(2) of this Article.

(1) **General Rules.**

(A) **Format and Categories.** Each statement shall be in a format (including but not limited to computer formats) and in categories specified by the Executive Director.

(B) **When Different Statements are Required**. The Executive Director may establish, modify, and enforce schedules for the submittal of statements where it is reasonably necessary for orderly processing of submittals, for example when manufacturers or third parties often submit many statements simultaneously.

(C) **Asterisks in Model Numbers.** In filing any statement, the manufacturer may use asterisks as a substitute for letters, numbers, blanks, or other characters in the model number, provided that an asterisk (i) shall be used only for a part of the model number that does not indicate energy consumption, energy efficiency, water consumption, or water efficiency, or a design or feature affecting such efficiency or consumption; (ii) shall represent a single letter, number, blank, or other character at the asterisk's location in the model number; and (iii) shall not be used for any of the first four letters, numbers, blanks, or other characters in the model number.

(D) **Different Functions.** Except as provided in ~~S~~section 1606(a)(1)(G) of this Article, if the same appliance is sold or offered for sale as more than one type of appliance shown in Table X (for example, if the appliance can serve both water heating and pool heating functions), the manufacturer shall submit a separate statement for each model of that appliance type. Each appliance type for which a statement is submitted must match all the common identifiers shown in Table X.

(E) **Multiple Statements.** A manufacturer may electronically file statements through the MAEDbS for more than one appliance in a single submittal to the Executive Director. If a submittal contains statements for more than one appliance, there shall be only one statement for each appliance, except as provided in ~~S~~sections 1606(a)(1)(D) and 1606(a)(1)(G) of this Article. The Executive Director shall allow multiple statements to be submitted ~~on the same sheet of paper or~~ in the same electronic file

under conditions she or he determines are reasonably necessary to ensure accuracy and compatibility with the ~~database~~MAEDbS.

(F) **Split System Central Air Conditioners.** The statement for split system air conditioners shall be for the combination of the compressor-containing unit and the non-compressor-containing unit most likely to represent the highest national sales volume, consistent with ~~S~~section 1604(c)(3) of this Article.

(G) **Combination Space-Heating and Water-Heating Appliances.** Manufacturers of combination space-heating and water-heating appliances shall file two statements for each such appliance. The first statement shall contain the information listed in Table X for combination space-heating and water-heating appliances, and all other information shown in Table X for "all appliances;" and the second statement shall contain the information listed in Table X for the primary function of the appliance according to the determination required by ~~S~~sections 1605(e) and 1605(f) of this Article, and containing all other information shown in Table X for "all appliances." Each appliance type for which a statement is submitted must match all the common identifiers shown in Table X.

(2) **Manufacturer Information.**

(A) The name, address, telephone number, e-mail address, and, if available, fax number~~,~~ and URL (web site) address~~, and e-mail address~~ of the manufacturer; provided, however, that if a parent entity is filing on behalf of a subsidiary entity, if a subsidiary entity is filing on behalf of a parent entity, or if an affiliate entity is filing on behalf of an affiliate entity, then each entity shall be clearly identified and the information shall be provided for both entities.

(B) The name, address, telephone number, e-mail address, and, if available, fax number ~~and e-mail address~~ of the individual to contact concerning the statement pursuant to ~~S~~section 1606(a)(4) of this Article. There shall be only one individual to contact for each category (box) in the "Appliance" column of Table X, except that the individual may, during his or her absence, delegate his or her duties in this regard.

(C) The name, address, telephone number, e-mail address, and, if available, fax number ~~and e-mail address~~ of the person signing the declaration pursuant to ~~S~~section 1606(a)(4) of this Article.

(3) **Testing and Performance Information.**

(A) A statement that the appliance has been tested in accordance with all applicable requirements of ~~S~~sections 1603 and 1604 of this Article. If ~~S~~section 1604 of this Article provides more than one test method that may be used, the manufacturer shall identify which method was used.

(B) The name and address and, if available, telephone number, fax number, URL (web site) address, and e-mail address of the laboratory or other institution where the testing required by ~~S~~sections 1603 and 1604 of this Article was performed.

(C) The applicable information listed in Table X; provided, however, that submittal of information marked with "[1]" is voluntary for federally regulated appliances, and that submittal of information marked with "[2]" is voluntary for state-regulated appliances. Where there is text in the "Permissible Answers" column, the information provided must be one of the answers shown. If the text in the "Permissible Answers" column states "other (specify)," the information provided must be a specific response for the "Required Information" category (e.g., a response of "other" is not acceptable).

~~**Exception 1. to Section 1606(a)(3)(C):**~~

~~Section 1606(a)(3)(C) does not apply to any water heater:~~

~~(1) that is within the scope of 42 U.S.C. sections 6292(a)(4) or 6311(1)(F),~~

~~(2) that has a rated storage volume of less than 20 gallons, and~~

~~(3) for which there is no federal test method applicable to that type of water heater.~~

Exception ~~2~~1. to Section 1606(a)(3)(C) of this Article:

If an appliance has an alternative test procedure pursuant to ~~S~~section 1603(c)(1) of this Article, or an alternative assessment method specified pursuant to ~~S~~section 1603(c)(2)(A) of this Article, then the statement shall include:

(1) the following information from Table X: Manufacturer's Name, Brand Name, Model Number, and Regulatory Status; and

(2) all information from Table X that is applicable to the appliance and that is produced during the alternative test procedure or the alternative assessment method; and

(3) all other energy performance information produced during the alternative test procedure or the alternative assessment method.

Exception ~~3~~2. to Section 1606(a)(3)(C) of this Article:

If the Executive Director has specified that there is no test method for an appliance pursuant to ~~S~~section 1603(c)(2)(B) of this Article, then the statement shall include the following information from Table X: Manufacturer's Name, Brand Name, Model Number, and Regulatory Status.

EXCEPTION 3. to Section 1606(a)(3)(C):

Manufacturers of state-regulated LED lamps and LED versions of state-regulated small-diameter directional lamps may certify estimated values for rated lifetime until testing per section 1604 is complete. When reporting estimated values, the certification report shall describe the prediction method, which must be generally representative of the methods specified in 10 C.F.R. Appendix BB to subpart B of part 430, "Uniform Test Method for Measuring the Input Power, Lumen Output, Lamp Efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Power Factor, Time to Failure, and Standby Mode Power of Integrated Light-Emitting Diode (LED) Lamps." Manufacturers shall maintain records of the development of all estimated values and any associated initial test data. Manufacturers shall update the certification in the MAEDBS upon completion of the required test procedures for rated lifetime.

(~~E~~D)**How Tested Data Must Be Reported.**

1. For any numerical value required by Table X that is produced by a test specified in ~~S~~section 1604 of this Article, the reported value shall be no higher for the value for which the consumer would prefer a high number, and no lower for the value for which the consumer would prefer a low number, than the values obtained by testing; unless different specific instructions are specified in the test method specified in ~~S~~section 1604 of this Article.

2. For any numerical value required by Table X that is produced by calculation from measured numerical test results, the reported value shall be no higher for the values where the consumer would prefer a high number than the exact result of the calculation, and no lower than the exact result of the calculation where the consumer would prefer a low number, than the values obtained by calculating, unless different specific instructions are specified in the test method specified in ~~S~~section 1604 of this Article.

3. Manufacturers may report:

   a. numbers higher than tested values, where the consumer would, all other things being equal, prefer lower values (or is indifferent); and

   b. numbers lower than tested values, where the consumer would, all other things being equal, prefer higher values (or is indifferent).

Example: An air conditioner is tested using the appropriate test method specified in ~~S~~section 1604 of this Article, and the test method does not include specific instructions about the precision of reporting.

- Cooling capacity is measured as: 36,014 Btu per hour.
- For cooling capacity, consumers prefer higher values.
- The manufacturer may not report any value over 36,014 Btu per hour.
- The manufacturer chooses to report 36,000 Btu per hour.
- Electrical energy use is measured at 3,487 watts.
- For electrical energy use, consumers prefer lower values.

- The manufacturer may not report any value under 3,487 watts.
- The manufacturer chooses to report 3,500 watts.
- Using the data the manufacturer chooses to report, EER = 36,000/3,500 = 10.285714.
- For EER, consumers prefer higher values.
- The manufacturer may not report any value of EER over 10.285714 (if EER is reported with only one decimal place, the maximum value would be 10.2).
- The manufacturer chooses to report EER = 10.2 Btu per watt hour.
- If the manufacturer had chosen to report the cooling capacity as 36,014 Btu per hour, and the electrical energy use as 3,487 watts, the calculated EER would have been 36,014/3,487 = 10.328076. In this case the manufacturer could not report any value of EER over 10.328076 (if EER is reported with only one decimal place, the maximum value would be 10.3).

~~**EXCEPTION 4 to Section 1606(a)(3)(C):**~~

~~Before July 1, 2014, manufacturers of large battery charger systems may certify multiple battery charger systems using the testing results of two or more representative battery charger system models, provided that all models so certified are designed to charge batteries of the same chemistry and design. All models certified in this manner must meet the requirements of Section 1606(a)(3)(C), in that untested models must have performance characteristics equal to or better than what is certified. For this reason, the models selected for testing by the manufacturer must be those that the manufacturer expects to have the lowest performance out of the set to be certified, and manufacturers must report the lowest values generated by the performed tests.~~
~~Manufacturers certifying their models using this alternate method shall, as part of the declaration required in Section 1606(a)(4), make a statement under penalty of perjury that all certified models meet all applicable standards and have performance characteristics equal to or better than the reported results.~~

~~**EXCEPTION 5. to section 1606(a)(3)(C):**~~

~~Manufacturers of state-regulated LED lamps and LED versions of state-regulated small-diameter directional lamps may certify estimated values for rated lifetime until testing per section 1604 is complete. When reporting estimated values, the certification report shall describe the prediction method, which must be generally representative of the methods specified in 10 C.F.R. Appendix BB to subpart B of part 430, "Uniform Test Method for Measuring the Input Power, Lumen Output, Lamp Efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Power Factor, Time to Failure, and Standby Mode Power of Integrated Light-Emitting Diode (LED) Lamps." Manufacturers shall maintain records of the development of all estimated values and any associated initial test data. Manufacturers shall update the certification in the MAEDBS upon completion of the required test procedures for rated lifetime.~~

Table X
Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
	All Appliances	* Manufacturer's Name	
		* Brand Name	
		* Model Number	
		Date model to be displayed	
		Regulatory Status	Federally- regulated consumer product, federally- regulated commercial and industrial equipment, non-federally- regulated
A	Non-Commercial Refrigerators, Non-Commercial Refrigerator-Freezers, Non-Commercial Freezers	*~~Style~~Product Class	Category in Table A-2 or Table A-3 (specify)
		~~*Defrost System~~	~~Automatic, manual, partial-automatic~~
		~~*Type~~	~~Refrigerator, refrigerator-freezer, freezer~~
		Access[1, 2]	Door, drawer, both door and drawer
		~~Compact, built-in, neither compact nor built-in~~	~~Compact, built-in, neither compact nor built-in~~
		Kitchen Unit[1, 2]	~~Yes, no~~ True, False
		~~Internal Freezer~~[1, 2]	~~Yes, no~~
		~~Wine Chiller~~	~~Yes, no~~
		~~Chest Refrigerator~~[1, 2]	~~Yes, no~~
		~~Equipped with Automatic Ice Maker (for those units manufactured on or after September 15, 2014 only)~~	~~Yes, no~~
		~~Dispenses Ice Through Door~~	~~Yes, no~~
		Refrigerator Volume	
		Freezer Volume	
		Total Volume	
		Adjusted Total Volume	
		Height	
		Width	
		Depth	
		Annual Energy Use~~Consumption~~ (low)	
		Annual Energy Use~~Consumption~~ (high)	
		Annual Energy Use~~Consumption~~ (mean)	
		Anti-sweat Heater Switch	~~Yes, no~~ True, False
		Refrigerant Type[1, 2]	Ozone-depleting, non-ozone-depleting
		Insulation Type[1, 2]	Ozone-depleting, non-ozone-depleting

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.
1 = Voluntary for federally- regulated appliances
2 = Voluntary for state-regulated appliances

Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
A	Self-contained Commercial Refrigerators with or without doors, Self-contained Commercial Refrigerator-Freezers with or without doors, Self-contained Commercial Freezers with or without doors, Self-contained Commercial Refrigerators specifically designed for display and sale of bottled or canned beverages with or 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, transparent, horizontal closed transparent, including all Energy 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)	*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
		Total Compartments (for hybrid models and refrigerator-freezers)	
		Equipment Family	Vertical open, semivertical open, horizontal open, vertical closed transparent, horizontal closed transparent, vertical closed solid, horizontal closed solid, service over counter
		Condensing Unit Configuration	Remote, self-contained
		Multiple ~~c~~Compartments ~~number~~ Product Code	
		Total Display Area (TDA)	
		Total Volume	
		Height	
		Width	
		Depth	
		Anti-condensate Energy Consumption (AEC) (for hybrid models and refrigerator-freezers)	
		Condensate Evaporator Pan Energy Consumption (PEC) (for hybrid models and refrigerator-freezers)	
		Defrost Energy Consumption (DEC) (for hybrid models and refrigerator-freezers)	
		Fan Energy Consumption (FEC) (for hybrid models and refrigerator-freezers)	
		Compressor Energy Consumption (CEC) (for hybrid models and refrigerator-freezers)	
		Lighting Energy Consumption (LEC) (for hybrid models and refrigerator-freezers)	
		Other Energy Consumption (OEC) (for hybrid models and refrigerator-freezers)	
		Daily Energy Consumption	
		Calculated Daily Energy Consumption (CDEC)	
		Total Daily Energy Consumption (TDEC)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
A	Self-contained Commercial Refrigerators with or without doors, Self-contained Commercial Refrigerator-Freezers with or without doors, Self-contained Commercial Freezers with or without doors, Self-contained Commercial Refrigerators specifically designed for display and sale of bottled or canned beverages with or without doors, Remote Condensing Commercial Refrigerators, Remote Condensing Commercial Freezers, Commercial Ice Cream Freezers; cont'd.	Refrigerant Type	Ozone-depleting, non-ozone-depleting
		Insulation Type	Ozone-depleting, non-ozone-depleting
	Automatic Commercial Ice-Makers	*Equipment Type	Ice-making head, remote-condensing, self-contained, both remote-condensing and remote-compressor
		*Cooling Type	Air, water
		~~*Type of Ice Harvested~~	~~Cube, flake, crushed, other (specify)~~
		*Ice Maker Process Type	Batch, continuous, cube, other (specify)
		Harvest Rate	
		Energy Consumption	
		Water Consumption	
		Ice Hardness Adjustment Factor (for continuous type models)	
	Water Dispensers	*Type	Bottle type; Bottle type with compartment~~,~~; Pressure type, bubbler; Pressure type with compartment, bubbler; Pressure type, faucet; Pressure type with compartment, faucet, Point-of-Use
		*Condenser Cooling Medium	Air-cooled; Water-cooled
		*Style	Free-standing; Flush-to-Wall; Wall Hung; Wall Hung semi-recessed; Remote; Recessed
		*Refrigerated Compartment	
		Temperatures delivered	Cold only, cook (ambient) and cold, hot and cold
		Cooling Capacity (gallons/hour)	
		Heating Capacity (6-oz. cup per hour)	
		Standby Energy Consumption (kWh/day)	

Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
A	Walk-in Coolers, and Walk-in Freezers: Doors	Door Type ~~Ice Hardness Adjustment Factor (for continuous type models)~~	Passage door (medium temperature), passage door (low temperature), freight door (medium temperature), freight door (low temperature), display door (medium temperature), display door (low temperature)
		Door surface area (ft^2)	
		Transparent reach-in?	Door, window, both
		Glass Type of Doors and Door Windows (if applicable)	1" triple pane insulated, 1" triple pane tempered, 2-pane Low-E Gas Fill, 3-pane gas fill, 3-pane heat reflective, 3-pane Low-E gas fill, 3-pane reflective gas fill, 3-pane heated, 3-pane unheated, none
		Anti-sweat heater power draw (W per ft^2 of door opening) (if applicable)	
		Door insulation R-value (if applicable)	
		All applicable design standards incorporated?	True, False
		Daily energy consumption (kWh/day)	
		Equipped with a timer, control system, or other demand-based control reducing lighting power and/or heater wire and/or other electricity-consuming device?	Lighting, heater wire, other electricity-consuming device, lighting + heater wire, lighting + other electricity-consuming device, heater wire + other electricity-consuming device, all, none
		Total rated lighting power (W) (if applicable)	
		Total rated heater wire power (W) (if applicable)	
		Total rated other electricity-consuming device power (W) (if applicable)	
	Walk-in Coolers, and Walk-in Freezers: Panels	Panel Type	Wall panels for walk-in coolers, ceiling panels for walk-in coolers, wall panels for walk-in freezers, ceiling panels for walk-in freezers, floor panels for walk-in freezers
		R-value of wall insulation (if applicable)	
		R-value of ceiling insulation (if applicable)	
		R-value of floor insulation (if applicable)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
A	Walk-in Coolers, and Walk-in Freezers: Refrigeration Systems	Refrigeration System Type	Dedicated condensing system medium temperature indoor; dedicated condensing system medium temperature outdoor; dedicated condensing system low temperature indoor; dedicated condensing system low temperature outdoor; unit cooler medium temperature, unit cooler low temperature
		Is outdoor dedicated condensing system also certified (for indoor dedicated condensing systems only)?	True, False
		Model number for outdoor dedicated condensing system (only applicable for indoor dedicated condensing systems where outdoor dedicated condensing system is also certified)	
		Refrigeration system net capacity (BTU/hr) (if applicable)	
		Evaporator fan motor horsepower (if applicable)	
		Condenser fan motor horsepower (if applicable)	
		All applicable design requirements incorporated?	True, False
		Process cooling refrigeration system?	True, False
		Annual Walk-in Energy Factor (AWEF)	
		Configuration tested for certification (if applicable)	Condensing unit only, unit cooler only, single package dedicated system, matched pair

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
A	Refrigerated Bottled or Canned Beverage Vending Machines	Equipment Class (reporting of Combination A or Combination B for models manufactured on or after January 8, 2019)	Class A, Class B, Combination A, Combination B
		Door Type	Glass front, closed front
		Machine use designation	Indoor, indoor/outdoor
		~~Maximum Daily Energy Consumption at 90°F. Ambient Temperature~~	
		Maximum Daily Energy Consumption at 75°F. Ambient Temperature ~~(for models manufactured on or after January 1, 2006)~~	
		Standard Vendible Capacity	
		Low Power State – lighting	True, false
		Low Power State – refrigeration	True, false
		Low Power State – whole machine	True, false
		On-Site Adjustable by Operator or Owner	True, false
		Refrigerant Type	Ozone-depleting, non-ozone-depleting
		Insulation Type	Ozone-depleting, non-ozone-depleting
		Internal volume	
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~~ True, False
		Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Combined Energy Efficiency Ratio at 95°F	
		Standby and Off Mode Annual Energy Consumption	
		Heating Capability	Heat pump, electric resistance heating, heat pump and electric resistance heating, no heating capability
		Refrigerant Type[1]	Ozone-depleting, non-ozone-depleting

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
B	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[1]	Ozone-depleting, non-ozone-depleting
		Compressor Power[1]	
C	Air Filters manufactured on or after April 1, 2019	Air filter sizes tested	Small, medium, and large
		Minimum Efficiency Reporting Value (MERV) (reportable for models tested to ASHRAE 52.2-2012 only)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, N/A
		Particle Size Efficiency for 0.3 to 1.0 µm particle size	
		Particle Size Efficiency for 1.0 to 3.0 µm particle size	
		Particle Size Efficiency for 3.0 to 10.0 µm particle size	
		Test Procedure used to determine air filter efficiency performance	AHRI 680-2009, or ASHRAE 52.2-2012
		Air Filter Length	
		Air Filter Width	
		Air Filter Depth	
		Air Filter Face Area	
		Face Velocity Utilized for the test procedure	Value in feet per minute ~~or N/A~~
		Airflow Rate value 1	
		Airflow Rate value 2	
		Airflow Rate value 3	
		Airflow Rate value 4	
		Airflow Rate value 5-Maximum Rated Airflow Rate	
		Initial Resistance at air flow rate value 1	Test results to one-hundredths of an Inch of Water Column
		Initial Resistance at air flow rate value 2	Test results to one-hundredths of an Inch of Water Column
		Initial Resistance at air flow rate value 3	Test results to one-hundredths of an Inch of Water Column
		Initial Resistance at air flow rate value 4	Test results to one-hundredths of an Inch of Water Column
		Initial Resistance at air flow rate value 5	Test results to one-hundredths of an Inch of Water Column

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
C	Air Filters (cont'd)	Final Resistance at the point where test is terminated and results determined	Test results to one-hundredths of an Inch of Water Column
		Dust Holding Capacity at the maximum rated airflow rate as published by the manufacturer	Test results in multiples of one gram
		Airflow Rate value determined at an Initial Resistance of 0.1 Inch of Water Column	
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
		*AHRI Classification	
		*Voltage	
		*Electrical Phase	1, 3
		Variable Refrigerant Flow	~~Yes, no~~ True, False
		Heat Recovery (for Variable Refrigerant Flow models only)	~~Yes, no~~ True, False
		Vertical Air Conditioner (for single package models only) (required on or after January 1, 2010)	~~Yes, no~~ True, False
		Refrigerant Type[1, 2]	Ozone-depleting, non-ozone-depleting
		Thermostatic Expansion Valve (for air-source or air-cooled models only)	~~Yes, no~~ True, False
		Compressor Motor Design	Single-speed, dual-speed, multiple-speed, variable-speed
	Air-Cooled, Single Package CAC < 65,000 Btu/hour and Air-Cooled, Split System CAC < 65,000 Btu/hour	Seasonal Energy Efficiency Ratio (SEER)[3]	
		Cooling Capacity at 82°F[3]	
		Electrical Input at 82°F[3]	
		Degradation Coefficient at 82°F[3]	
		Cooling Capacity at 95°F	
		Electrical Input at 95°F	
		Energy Efficiency Ratio (EER) at 95°F	
		Average Off Mode Power Consumption (Watts)	
		Space-constrained Product	Space-constrained; variable speed mini-split; small duct, high velocity; not space-constrained

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.

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

	Appliance	*Required Information*	*Permissible Answers*
C	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[3]	
		Electrical Input at 82°F[3]	
		Degradation Coefficient at 82°F[3]	
		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)	
		Heating Seasonal Performance Factor (HSPF) [3]	
		Heating Capacity	
		Electrical Input	
		Coefficient of Performance (COP) at 47°F (single package vertical heat pumps only)	
		Space-constrained Product	Space-constrained; variable speed mini-split; small duct, high velocity; not space-constrained
	Air-Cooled, Single Package CAC ≥ 65,000 and < 760,000 Btu/hour and 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 (effective for models manufactured before January 1, 2018)	
		Integrated Energy Efficiency Ratio (IEER) (effective for models manufactured on or after January 1, 2018)	
		Integrated Part Load Value (IPLV) If Applicable	
		Heating System Type[1, 2]	Gas, oil, electric resistance, none
	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 (effective for models manufactured before January 1, 2018)	
		Integrated Energy Efficiency Ratio (IEER) (effective for models manufactured on or after January 1, 2018)	
		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[1, 2]	Gas, oil, electric resistance, none

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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

	Appliance	*Required Information*	*Permissible Answers*
C	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)[3]	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		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[1]	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) [3]	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		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	
	Ground Water-Source, Single Package Heat Pumps and Ground Water-Source Split System Heat Pumps	Compressor Electrical Input (for models ≥ 65,000 Btu/hour only)	
		Indoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		Cooling Capacity at 59°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 240,000 Btu/hour)	
		Electrical Input at 59°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 240,000 Btu/hour)	
		Energy Efficiency Ratio (EER) at 59°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 240,000 Btu/hour)	
		Heating Capacity at 50°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 240,000 Btu/hour)	

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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.

Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
C	Ground Water-Source, Single Package Heat Pumps and Ground Water-Source Split System Heat Pumps cont'd.	Electrical Input at 50°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 240,000 Btu/hour)	
		Coefficient of Performance (COP) at 50°F Entering Water Temperature (for all sizes, including but not limited to models ≥ 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 ≥ 65,000 Btu/hour only)	
		Indoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		Outdoor Fan Electrical Input (for models ≥ 65,000 Btu/hour only) [3]	
		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	
	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	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
C	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; chilled-water-cooled
		Air Flow Direction	Downflow, horizontal flow, upflow
		Net Sensible Cooling Capacity (air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only)	
		Downflow Unit Power Input (watts) (air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only)	
		Downflow Unit SCOP (air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only)	
		Upflow Unit Power Input (watts) (air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only)	
		Upflow Unit SCOP(air-cooled, water-cooled, glycol-cooled, chilled-water-cooled models only)	
		Cooling Capacity at 95°F (evaporatively cooled models only)	
		Electrical Input at 95°F (evaporatively cooled models only)	
		Energy Efficiency Ratio (EER) at 95°F (evaporatively cooled models only)	
	Heat pump water-~~chilling~~heating packages	Voltage*	
		Phase*	1, 3
		Refrigerant Type	Ozone-depleting, non-ozone-depleting
		Compressor Motor Design*	Single-speed, dual-speed, multiple-speed, variable speed
		OD Fan Motor Design*	Single-speed, dual-speed, multiple-speed, variable speed
		Model number includes all components?	~~Yes, no~~ True, False
		Is the model designed for space cooling?	~~Yes, no~~ True, False
		Cooling Capacity (BTU per hour) if applicable	
		Cooing power input (watts) if applicable	
		Energy Efficiency Ratio (EER) if applicable	
		Integrated part load value (IPLV)	
		Heating Capacity (BTU per hour) at 47°F	
		Heating power input (watts) at 47°F	
		Coefficient of Performance (COP) at 47°F	
		Heating Capacity (BTU per hour) at 17°F	
		Heating power input (watts) at 17°F	
		Coefficient of Performance (COP) at 17°F	
		Heat Capacity (BTU per hour) of heat reclaim[2]	
		COPR of heat reclaim[2]	

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
D	Spot Air Conditioners	*Type	Single package, air-cooled; single package, evaporatively-cooled; split system: air-cooled condensing unit, coil with blower; split system: evaporatively-cooled condensing unit, coil alone; single package, air-cooled (FD); single package, evaporatively-cooled (FD); split system: air-cooled condensing unit, coil with blower (FD); split system: evaporatively-cooled condensing unit, coil alone (FD)
		Cooling Capacity	
		Total Electrical Input	
		Cooling Efficiency Ratio (CER)	
		Fan Electrical Input	
		Refrigerant Type	Ozone-depleting, non-ozone-depleting
	Evaporative Coolers	*Type	Direct, indirect, indirect/direct
		Evaporative Media Saturation Effectiveness (%) (for direct evaporative coolers only)	
		Media Type (for direct evaporative coolers only)	Expanded paper, woven plastic, aspen wood, rigid cellulose, other (specify).
		Cooling Effectiveness (for indirect evaporative coolers only)	
		Total Power (watts)	
		Airflow Rate (CFM)	
		ECER	
	Ceiling Fans~~, Except Low-Profile Ceiling Fans~~	Ceiling fan type (required for models manufactured on or after January 21, 2020 only)	High-speed small-diameter (HSSD), hugger, large diameter, standard, very small-diameter (VSD)
		CFM (low, medium, high)	
		Watts (low, medium, high)	
		Efficacy (low, medium, high) [CFM/watt] (required for models manufactured before January 21, 2020 only)	
		Efficiency (CFM/Watt) (required for models manufactured on or after January 21, 2020 only)	
		Fan speed controls separate from light controls	True, false
		Adjustable Speed Controls	(Specify) speed, variable
		Reversible Fan Action Capable	~~Yes, no~~ True, False, Exception [See ~~Section 1605.1(d)(1)(C)~~ section 1605.1(d)(1)(A)3. of this Article]
		Light Source Type	Compact fluorescent, incandescent, other ~~(specify)~~, None
	~~Low-Profile Ceiling Fans~~	~~None~~	

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
D	Ceiling Fan Light Kits	Socket Type	Medium screw base, pin-based; other (specify)
		Packaged with all appropriate lamps to fill all sockets	~~Yes, no~~ True, False
		Screw-based Lamps Requirement (Screw-base only)	Meet 1605.1(d)(2)(A)1.~~a. or b.~~ of this Article (specify)
		EnergyStar requirement compliant (pin-based sockets only)	~~Yes, no~~ True, False
		Operate with lamps totaling more than 190 watts (other socket types only)	~~Yes, no~~ True, False
D	Whole House Fans and Residential Exhaust Fans	*Residential Exhaust Fan Type	Inline single-port, Inline multi-port, Range hood, Bathroom and utility room
		*Whole-House Fan Type	Belt-drive single-fan, Belt-drive dual-fan, Direct-drive single-fan, Direct-drive dual-fan
		Fan Motor Power (watts)	
		Air Flow (CFM)	
		Air Flow Efficiency (CFM/watt)	
	Dehumidifiers	Product capacity (pints per day)	
		Energy Factor	
	Residential Furnace Fans	Furnace Fan Types	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
		Wattage	
		Airflow at the maximum airflow-control setting (in cfm) (Q_{Max})	
		Fan Energy Rating (FER)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
E	All Space Heaters	*Energy Source	Natural gas, LPG, oil, combination (natural gas and oil), electricity
		*Burner Type	Induced draft, luminous, injection type, power, pressure
		Constant burning pilot light, (for gas or oil models only)	~~Yes, no~~ True, False
		*Labeled for Outdoor Installation	~~Yes, no~~ True, False
		*Electrical Phase	1, 3, none
		Draft Equipment[1, 2]	Draft hood, draft diverter, barometric regulator, none
		Off-Cycle Devices	Stack damper, electro-mechanical inlet damper, electro-mechanical flue damper, none
		Flue Gas	Condensing, non-condensing
		Control	Single-stage, two-stage modulating, step modulating
		Fan Motor Design (furnaces only)[1, 2]	Single-speed, dual-speed, multiple-speed, variable speed
		Total Nominal Fan Motor Horsepower (furnaces only)	
		Fan Motor Type (furnaces only)	Premium, standard
		Fan Motor Power Factor (furnaces with variable-speed motors only) [1, 2]	
		Pump Motor Design (boilers only). Note: This information is not required for boilers that are not provided with a pump.	Single-speed, dual-speed, multiple-speed, variable speed
		Total Nominal Pump Motor Horsepower (boilers only). Note: This information is not required for boilers that are not provided with a pump.	
		Pump Motor Type (boilers only). Note: This information is not required for boilers that are not provided with a pump.	Premium, standard
		Pump Motor Power Factor (boilers with variable-speed motors only)[1, 2]	
		Nameplate Input Rating	
		Rated Output	

* "Identifier" information as described in ~~S~~section1602(a) of this Article.

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
E	Central Furnaces	*Mobile Home	~~Yes, no~~ True, False
		*Air Flow Direction	Up, Down, Horizontal
		Weatherized (required for non mobile-home furnaces manufactured on or after November 19, 2015 only)	~~Yes, no~~ True, False
		Fan Blower Capacity, High, at 0.5" W.C. [1, 2]	
		Fan Blower Capacity, Low, at 0.5" W.C. [1, 2]	
		Thermal Efficiency (for models ≥ 225,000 Btu/hour input and for three-phase equipment < 225,000 Btu/hour input for which the manufacturer chooses to test using 10 C.F.R. sections 431.75 and 431.76)	
		Standby Watts [controls, not fan energy] (for models ≥ 225,000 Btu/hour input only) [1, 2]	
		Annual Fuel Energy Consumption (for models < 225,000 Btu/hour input only, except for three-phase equipment for which the manufacturer chooses to test using 10 C.F.R. sections 431.75 and 431.76)	
		Annual Fuel Utilization Efficiency [AFUE] (for models < 225,000 Btu/hour input only, except for three-phase equipment for which the manufacturer chooses to test using 10 C.F.R. sections 431.75 and 431.76)	
		Annual Auxiliary Electrical Energy Consumption (for models < 225,000 Btu/hour input only, except for three-phase equipment for which the manufacturer chooses to test using 10 C.F.R. sections 431.75 and 431.76)	
		Thermal Efficiency at Minimum Capacity Provided and Allowed by the Controls (for models ≥ 225,000 Btu/hour input only) [1, 2]	
		Maximum Standby Mode Electrical Power Consumption (Watts) (applies to models manufactured on or after May 1, 2013 only) [1, 2]	
		Maximum Off Mode Electrical Power Consumption (Watts) (applies to models manufactured on or after May 1, 2013 only) [1, 2]	
	Room Heaters, Floor Furnaces, and Wall Furnaces	*Type	Room heater (vented fan); room heater (gravity); floor furnace (fan); floor furnace (gravity); wall furnace (direct vent fan); wall furnace (direct vent gravity); wall furnace (vented fan); wall furnace (vented gravity)
		Annual Fuel Utilization Efficiency (AFUE)	
		Auxiliary Electric Power (for fan-type heaters only)	
		Average Annual Auxiliary Electrical Energy Consumption (for fan-type heaters only)[1]	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
E	Duct Furnaces and Unit Heaters	*Type	Duct furnace; low static unit heater; high static unit heater; floor-mounted unit heater
		Thermal Efficiency at Maximum Rated Capacity (mandatory for duct furnaces, voluntary for unit heaters only)	
		Energy Consumption During Standby (mandatory for duct furnaces, voluntary for unit heaters only)	
		Thermal Efficiency at Minimum Rated Capacity (mandatory for duct furnaces, voluntary for unit heaters only)	
		Power-Venting	~~Yes, no~~ True, False
		Automatic Flue Damper	~~Yes, no~~ True, False
	Infrared Gas Space Heaters	*Type	Patio heater, non-patio heater
		Intensity	High, low
		Radiant Tube Type	~~Yes, no~~ True, False
		Portable	~~Yes, no~~ True, False
		Vented	~~Yes, no~~ True, False
		Physically Possible to Measure Radiant Coefficient	~~Yes, no~~ True, False
		Combustion Efficiency (for models using ANSI test method only)	
		Radiant Coefficient (for models using ANSI test method only; for models for which it is physically possible to measure radiant coefficient only)	
		Effective Heating Area (for patio heaters only)	
		Efficiency Index (for patio only)	
	Combination Space-Heating and Water-Heating Equipment	*Primary Function	Primary function is space heating, secondary function is domestic water heating; primary function is domestic water heating, secondary function is space heating
		Volume (measured)	
		Volume (rated)	
		Energy Factor (for those models whose primary function is water heating)	
		Effective Space-Heating Efficiency (CA_{AFUE}) (for those models whose primary function is water heating)	
		Annual Fuel Utilization Efficiency (AFUE) (for those models whose primary function is space heating)	
		Effective Water-Heating Efficiency (CA_{EF}) (for those models whose primary function is space heating)	
		Combined Annual Efficiency (CAE)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
E	Boilers	*Type	Steam, hot water
		Natural Draft (for gas-fired steam models manufactured on or after March 2, 2012 and ≥ 300,000 Btu/hour input only)	~~Yes, no~~ True, False
		Design	C~~c~~opper, cast iron, other
		Automatic means for adjusting water temperature (small hot water boilers only)	~~Yes, no~~ True, False
		Input at Minimum Capacity[1]	
		Output at Minimum Capacity[1]	
		Combustion Efficiency (for models ≥ 300,000 Btu/hour input only)	
		Thermal Efficiency (for models ≥ 300,000 Btu/hour input and < 2,500,000 Btu/hour input only)	
		Thermal Efficiency (for models ≥ 2,500,000 Btu/hour input only)[1]	
		Standby Loss (for packaged boilers ≥ 300,000 Btu/hour input only) [1]	
		Standby Loss (for non-packaged boilers ≥ 300,000 Btu/hour input only) [2]	
		Thermal Efficiency at Minimum Capacity Rating (for non-packaged boilers ≥ 300,000 Btu/hour input only)	
		AFUE (for models < 300,000 Btu/hour input only)	
F	All Water Heaters	*Energy Source	Natural gas, LPG, oil, electric resistance, heat pump
		Rated Volume (except booster heaters, hot water dispensers, and large instantaneous water heaters < 10 gallons capacity)	
		Measured Volume (~~large~~ water heaters regulated under subpart G of 10 C.F.R. part 431 as of January 1, 2017 only)	
		~~Rated~~ Input Rating (if applicable)	
		Heat Traps (for storage models only)	~~Yes, no~~ True, False
		Ozone Depleting Substance in Insulation[1, 2]	~~Yes, no~~ True, False
		Ozone Depleting Substance in Refrigerant (for heat pump water heaters only) [1, 2]	~~Yes, no~~ True, False
		Constant burning pilot light (for large gas and oil models only)	~~Yes, no~~ True, False
		Mobile Home	~~Yes, no~~ True, False
	~~Booster Heaters~~	~~Flow Capacity~~	
		~~Thermal Efficiency at 100% Capacity with 110°F Water Input Temperature~~	
	~~Hot Water Dispensers~~	~~Standby Loss~~	
	~~Mini-Tank Electric Water Heater~~	~~First Hour Rating~~	
		~~Height~~	
		~~Width at the Point of Greatest Width~~	
		~~Depth at the Point of Greatest Depth~~	
		~~Recovery Efficiency~~	
		~~Standby Loss % per hour~~	
		~~Total Standby Loss~~	
		~~Annual Energy Consumption~~	
	~~Other Small Electric Water Heaters~~	~~Annual Energy Consumption[1, 2]~~	
		~~Tabletop Water Heater~~	~~Yes, no~~
		~~First Hour Rating~~	
		~~Energy Factor~~	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
F	~~Large Electric Water Heaters~~	~~Thermal Efficiency (instantaneous models only)~~	
		~~Standby Loss, % per hour (except for those models > 140 gallons for which exemption from standby loss standard is claimed).~~ ~~Note: This data requirement is mandatory for all models except large instantaneous models in which the data requirement is voluntary.~~	
		~~Standby Loss, watts (except for those models > 140 gallons for which exemption from standby loss standard is claimed)~~	
		~~R-value of Insulation (for models > 140 gallons except those which comply with standby loss standard)~~	
	~~Small Gas Water Heaters and Small Oil Water Heaters~~ Water Heaters Regulated Under 10 C.F.R. section 430.32(d)	Water Heater Type	Gas-fired storage, oil-fired storage, electric storage, tabletop, instantaneous gas-fired, instantaneous electric, grid-enabled
		First Hour Rating (for storage models only)	
		Maximum Gallons Per Minute (for instantaneous models only)	
		Recovery Efficiency	
		Annual Electrical Energy Consumption~~1, 2~~	
		Annual Fossil Fuel Energy Consumption (fossil-fuel-fired models only)	
		Draw Pattern	Very small, low, medium, high
		Uniform Energy Factor	
		Pilot Light Energy Consumption (for gas instantaneous models only)	
	~~Large Gas Water Heaters and Large Oil Water Heaters~~ Water Heaters Regulated Under 10 C.F.R. Section 431.110 (EXCEPT residential-duty commercial water heaters)	Water Heater Type	Electric storage; gas-fired storage; oil-fired storage; gas-fired instantaneous; oil-fired instantaneous;
		Thermal Efficiency	
		Standby Loss, %/hr (electric models only) (except for those models > 140 gallons for which exemption from standby loss standard is claimed). Note: This data requirement is mandatory for all models except ~~large~~ instantaneous models in which the data requirement is voluntary.	
		Standby Loss, Btu/hr (fossil-fuel-fired models only) (except for those models > 140 gallons for which exemption from standby loss standard is claimed). Note: This data requirement is mandatory for all models except ~~large~~ instantaneous models in which the data requirement is voluntary.	
		Electrical Power During Recovery While Appliance is Heating (for storage models only)	
		Electrical Power During Standby	
		R-value of Insulation (for models > 140 gallons only) for which exemption from standby loss is claimed	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
F	Water Heaters Regulated Under 10 C.F.R. Section 431.110 (EXCEPT residential-duty commercial water heaters) (cont'd)	Flue Damper (for models > 140 gallons only)	~~Yes, no~~ True, False
		Fan Assisted Combustion (for models > 140 gallons only)	~~Yes, no~~ True, False
		Hot Water Supply Boiler (for instantaneous models with input => 300,000 Btu/hour and <= 12,500,000 Btu/hour only)	~~Yes, no~~ True, False
	~~Heat Pump Water Heaters~~	~~Current Rating~~	
		~~Voltage~~	
		~~Energy Factor (for models ≤ 24 amps current rating only)~~	
		~~Standby Loss (for models >24 amps current rating only)~~	
		~~Thermal Efficiency (for models > 24 amps current rating and ≥ 4,000 Btu/hour per gallon only)~~	
		~~R-value of Insulation (for models > 24 amps current rating only)~~	
		~~Refrigerant Type[1, 2]~~	~~Ozone-depleting, non-ozone-depleting~~
	Residential Duty Commercial Water Heaters	Water Heater Type	Gas-fired storage, oil-fired storage, electric instantaneous
		Volume	
		Input	
		Draw Pattern	Very small, low, medium, high
		Uniform Energy Factor	
G	Heat Pump Pool Heaters	Heating Capacity at Standard Temperature Rating	
		Readily-Accessible On-Off Switch	~~Yes, no~~ True, False
		Coefficient of Performance at Standard Temperature Rating	
		Heating Capacity at Low Temperature Rating	
		Coefficient of Performance at Low Temperature Rating	
		~~Heating Capacity at Spa Conditions Rating~~	
		Average Coefficient of Performance (COP) at ~~Spa Conditions~~ Standard Temperature Rating and Low Temperature Rating	
		Refrigerant Type[1, 2]	Ozone-depleting, non-ozone-depleting
	Other Pool Heaters	Energy Source	Natural gas, LPG, oil, electric resistance
		Constant Burning Pilot Light (for gas models)	~~Yes, no~~ True, False
		Input	
		Thermal Efficiency	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
	Pumps (data collection required for models manufactured on or after January 27, 2020 only)	Equipment Class	Category in Table G-2
		Total Pump Head in feet at BEP	
		Total Pump Head in feet at nominal speed	
		Volume per unit time (flow rate) in gallons per minute (gpm) at BEP	
		Volume per unit time (flow rate) in gallons per minute (gpm) at nominal speed	
		Nominal speed of rotation (rpm)	
		Calculated driver power input at each load point *i* (P^{in}_i), corrected to nominal speed, in horsepower (hp)[3]	
		Driver power input at each load point *i* (P^{in}_i), corrected to nominal speed, in horsepower (hp)[4]	
		Driver power input (measured as the input power to the driver and controls) at each load point *i* (P^{in}_i), corrected to nominal speed, in horsepower (hp)[5]	
		Full impeller diameter in inches	
		PEI_{CL} calculated or tested[4]	
		PEI_{VL} calculated or tested[5]	
		Number of stages tested RSV and ST pumps only)	
		Pump efficiency at BEP in percent (%) [1,3,4]	
		Pump efficiency at BEP in PER_{CL} [1,3,4]	
		Pump efficiency at BEP in percent (%) [1,5]	
		Pump efficiency at BEP in PER_{VL} [1,5]	
		Pump configuration	
		Nominal motor efficiency in percent (%)[4,5,6]	
		Motor horsepower (hp) for the motor with which the pump is being rated[4,5,6]	
		Bowl diameter in inches (ST pumps only)[3,4,5]	
		PEI_{CL}	
		PEI_{VL}	
		C-value	

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3 = For pumps tested to the test methods prescribed in 10 C.F.R. section III of appendix A to subpart Y of part 431.
4 = For pumps tested to the test methods prescribed in 10 C.F.R. section IV or V of appendix A to subpart Y of part 431.
5 = For pumps tested to the test methods prescribed in 10 C.F.R. section VI or VII of appendix A to subpart Y of part 431.
6 = For pumps sold with electric motors regulated by DOE's energy conservation standards for electric motors at §431.25.

Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
G	Residential Pool Pump and Motor Combinations and Replacement Residential Pool Pump Motors	Motor Construction	PSC, Capacitor Start-Capacitor Run, ECM, Capacitor Start-induction run, split-phase Permanent Magnet Synchronoeus
		Motor Design	Single-speed, dual-speed, multi-speed, variable-speed
		Frame	
		Speed (in RPM)	
		Motor has Capability of Operating at Two or More Speeds with the Low Speed having a Rotation Rate that is No More than One-Half of the Motor's Maximum Rotation Rate	Yes, no True, False
		Unit Type	Residential Pool Pump and Motor Combination, Replacement Residential Pool Pump Motor
		Pool Pump Motor Capacity	
		Motor Service Factor	
		Motor Efficiency (%)	
		Nameplate Horsepower	
		Pump Control Speed (compliance with Ssection 1605.3(g)(5)(B)2. of this Article)	Yes, no True, False
		Flow for Curve 'A' (in gpm)	
		Power for Curve 'A' (in watts)	
		Energy Factor for Curve 'A' (in gallons per watt-hour)	
		Flow for Curve 'B' (in gpm)	
		Power for Curve 'B' (in watts)	
		Energy Factor for Curve 'B' (in gallons per watt-hour)	
		Flow for Curve 'C' (in gpm)	
		Power for Curve 'C' (in watts)	
		Energy Factor for Curve 'C' (in gallons per watt-hour)	
	Portable Electric Spas	*Voltage	
		Volume (gallons)	
		Rated Capacity (number of people)	
		Normalized Standby Power (watts)	
		Spa Enclosure is Fully Insulated	Yes, no True, False

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
H	Plumbing Fittings	*Type	Showerhead, lavatory faucet (independent or collective), public lavatory faucet, kitchen faucet, metering faucet (independent or collective), lavatory replacement aerator, kitchen replacement aerator, wash fountain, lift-type tub spout diverter, turn-type tub spout diverter, pull-type tub spout diverter, push-type tub spout diverter
		Flow Rate	
		Pulsating (for showerheads only)	~~Yes, no~~ True, False
		Minimum Flow rate at 45 psi and 80 psi (for showerheads manufactured on or after July 1, 2016)	
		Minimum Flow rate at 20 psi (for showerheads manufactured on or after July 1, 2016)	
		Rim Space (for wash fountains only)	
		Tub Spout Leakage Rate When New	
		Tub Spout Leakage Rate After 15,000 Cycles	
	Commercial Pre-rinse Spray Valves	Product Class (required for models manufactured on or after January 28, 2019)	Product Class 1, Product Class 2, Product Class 3
		Flow Rate (gpm)	
		Spray force (ounce-force (ozf)) (required for models manufactured on or after January 28, 2019)	
		Cleaning ability test	Pass, fail
I	Plumbing Fixtures	*Type	Blowout water closet, gravity tank type water closet, duel-flush water closet, electromechanical hydraulic water closet, flushometer tank water closet, prison-type urinal, prison-type water closet, flushometer valve water closet, trough-type urinal, wall-mounted urinal, waterless urinal, other type urinal, vacuum type water closet
		Water Consumption (dual-flush effective volume for dual-flush water closet)	
		Passes waste extraction test	~~Yes, no~~ True, False
		Waste extraction value	grams
		Trough Length (trough-type urinals only)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
J	Fluorescent Lamp Ballasts	*Ballast Input Voltage	120, 277, between 120 and 277, other (specify)
		*Number of Lamps	
		*Type of Fluorescent Lamp	F34T12, F96T12/ES, F96T12HO/ES, ~~(~~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
		Product Class (from U.S. DOE CCMS product template)	
		Designed for Dimming to 50% or Less of Maximum Output	~~Yes, no~~ True, False
		Power Factor	
		*Building Application	Commercial, designed (not classified as sign ballasts) to operate 8-foot high output lamps, designed and labeled as sign ballasts to operate 8-foot high output lamps, residential; not classified as residential, other
		Sign Ballasts	~~Yes, no~~ True, False
		Input Power Watts	
		Ballast Luminous Efficiency	
		Circuit Design	Cathode cut-out, electronic, magnetic
		*Start	Instant, programmed, rapid
		Ballast Frequency	High frequency, low frequency, other
		Average Total Lamp Arc Power	
	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_{100}	
		Arc Power 100	
		P_{80}	~~(answer N/A if not applicable)~~
		Arc Power 80	~~(answer N/A if not applicable)~~
		P_{50}	~~(answer N/A if not applicable)~~
		Arc Power 50	~~(answer N/A if not applicable)~~
		BLE 100	
		BLE 80	~~(answer N/A if not applicable)~~
		BLE 50	~~(answer N/A if not applicable)~~
		P_0 (standby mode power)	
		Weighted Ballast Luminous Efficacy	
		Power Factor	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
K	Federally~~-~~ regulated general service fluorescent lamps	*Type	4-foot medium ~~bi-pin~~bipin general service fluorescent lamp, 2-foot U-shaped general service fluorescent lamp, 8-foot slim line general service fluorescent lamp, 8-foot high output general service fluorescent lamp, 4-foot miniature ~~bi-pin~~bipin standard output general service fluorescent lamp, 4-foot miniature ~~bi-pin~~bipin high output general service fluorescent lamp
		~~Nominal Lamp Wattage~~	
		Rated Color Rendering Index	
		Correlated Color Temperature (for lamps manufactured on or after July 15, 2012)	
		Minimum Average Lamp Efficacy (LPW)	
	Federally regulated incandescent reflector lamps~~, and state regulated incandescent reflector lamps~~	~~Nominal Lamp Wattage~~	
		Minimum Average Lamp Efficacy	
	Federally regulated Medium Screw Base Compact Fluorescent Lamps	Lamp Power (Watts)	
		Minimum Efficacy (LPW)	
		Lamp Configuration	Bare or Covered (no reflector)
		1,000 Hour Lumen Maintenance	~~Yes, no~~ True, False
		Lumen Maintenance Requirements	~~Yes, no~~ True, False
		Rapid Cycle Stress Test	~~Yes, no~~ True, False
		Average Rated Lamp Life	~~Yes, no~~ True, False
	Federally regulated Medium Screw Base General Service Incandescent Lamps; ~~Medium Screw Based LEDs,~~ OLEDs	Type	General Service Incandescent, LED, OLED
		Voltage Range	
		Rated Lumen Range	
		Maximum Rate Wattage	
		Minimum Rate Lifetime	
		Color Rendering Index	
		Minimum Efficacy (LPW) (required on or after January 1, 2018)	
		Modified Spectrum	~~Yes, no~~ True, False
		Bulb Finish (incandescent only)	Clear, frost, soft white
		ANSI-designated Bulb Shape	~~A-15, A-19, A-21, A-23, A-25, PS-25, PS-30, BT-14.5, BT-15, CP-19, TB-19, CA-22~~ A15, A19, A21, A23, A25, PS25, PS30, BT14.5, BT15, CP19, TB19, CA22
	Federally regulated Candelabra Base and Intermediate Base Incandescent Lamps	Base Type	Candelabra, intermediate
		Maximum Rated Wattage	
	Medium Screw Base Modified Spectrum General Service Incandescent Lamp	Type	
		Rated Voltage	
		Rated Lumen Range	
		Maximum Rate Wattage	
		Minimum Rate Lifetime	
		Color Rendering Index	

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
K	~~State-regulated general service incandescent lamps~~	~~Rated Lumens~~	
		~~Rated Lamp Wattage~~	
		~~Bulb finish~~	~~Clear, frost, soft white~~
		~~Average Lamp Efficacy~~	
		~~ANSI-designated bulb Shape~~	~~A-15, A-19, A-21, A-23, A-25, PS-25, PS-30, BT-14.5, BT-15, CP-19, TB-19, CA-22~~
	State-regulated medium screw base general service Compact Fluorescent lamps	Rated lumens	
		Rated lamp wattage	
		Average lamp efficacy	
	State-regulated small diameter directional lamps	Base Type	
		Lamp Type (examples ~~PAR-16, MR-11, MR-16, or R~~ PAR16, MR11, MR16, R)	
		Lamp Power (Watts)	
		Lamp Output (Lumens)	
		Beam Angle	
		Center Beam Candle Power (CBCP)	
		Efficacy (Lumens per watt)	
		Color Rendering Index (CRI)	
		Combined CRI + Efficacy (only applies where efficacy < 80 LPW)	
		Correlated Color Temperature	
		Rated Lifetime Test Completed	True, False
		Estimated Rated Lifetime (hours) (when "Rated Lifetime Test Completed = False)	
		Rated Lifetime (hours) (when "Rated Lifetime Test Completed = True)	
	~~State-regulated medium screw base general service Organic LED (OLED) lamps~~	~~Rated lumens~~	
		~~Rated lamp wattage~~	
		~~Average lamp efficacy~~	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
K	State-regulated Light Emitting Diode (LED) lamps	*Base Type	E12, E17, E26, ~~GU-24~~GU24, retrofit kit
		Lamp Shape	A, B, BA, C, CA, F, G, Other
		~~Light Distribution~~	~~Directional, Omnidirectional, Decorative, Spot, Recessed Can~~
		Dimmable	~~Yes, no~~ True, False
		Minimum Dimming Level (%) (if Dimmable equals True)	
		Reduced Flicker Operation (if Dimmable equals True)	~~Yes, no~~ True, False
		Correlated Color Temperature	
		Duv	
		Rated Lifetime Test Completed	True, False
		Estimated Rated Lifetime (hours) (when "Rated Lifetime Test Completed = False)	
		Rated Lifetime (hours) (when "Rated Lifetime Test Completed = True)	
		Lifetime test environment temperature[2]	Ambient, Elevated
		Lamp Power (Watts)	
		Lumen Output (Lumens)	
		Efficacy (Lumens per watt)	
		Color Rendering Index (Ra)	
		Compliance Score	
		Power Factor	
		Standby Mode	True, False
		Standby Power (watts) (if applicable)	
		Connected network type (if applicable)	Wi-Fi, ZigBee, ANT, Bluetooth, RF, Wired, Other (specify)
		R_1	
		R_2	
		R_3	
		R_4	
		R_5	
		R_6	
		R_7	
		R_8	
		R_9 [2]	
		Meets applicable luminous intensity distribution requirements	ENERGY STAR Omnidirectional, ~~California Quality Specification Omnidirectional,~~ ENERGY STAR Decorative, ~~California Quality Specification Recessed Can Housing Retrofit Kit, California Quality Specification Spotlight, California Quality Specification Floodlight,~~ none.
		~~Warranty Length (years)~~ [2]	
		Audible Noise at 100% output (decibels) (if Dimmable equals True)	
		Audible Noise at 20% output (decibels) (if Dimmable equals True)	
		Start Time [2]	
		6000 hour lumen maintenance [2]	
		6000 hour survival rate [2]	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
K	State-regulated Light Emitting Diode (LED) lamps (cont'd)	Projected time to L70 [2]	
		Dimming Control Compatibility (if Dimmable equals True)	Forward, Phase cut control, reverse phase cut, powerline carrier, digital, 0-10 VDC, other.
		NEMA SSL 7A Compatible [2] (If compatible with forward phase cut dimmer control answer "~~Yes~~True," If not answer "~~No~~False.")	~~Yes, no~~ True, False
		~~Marked in accordance with Title 24 JA-8 [2]~~	~~Yes, no~~
		~~Meets the Voluntary California Quality Specification 2.0 requirements applicable to the lamp type~~	~~Yes, no~~
L	Emergency Lighting	Light Source Type	LED, electroluminescent, fluorescent, incandescent, other (specify)
		Height of Letters "E, X, T"	
		Width of Letters "E, X, T"	
		Height of Letter "I"	
		Width of Letter "I"	
		Battery Backup	~~Yes, no~~ True, False
		Number of Faces	
		Input Power Watts	
		Ballast Luminous Efficiency	
		Circuit Design	Cathode cut-out, electronic, magnetic
		*Start	Instant, programmed, rapid
		Ballast Frequency	High frequency, low frequency, other
		Average Total Lamp Arc Power	
		Sign Format	Edge-lit, panel, matrix, stencil, other (specify)
		Input Power	
		Minimum Luminance of Face	
		Maximum Luminance of Face	
		Average Luminance of Face	
		Maximum to Minimum Luminance Ratio	
		Luminance Contrast	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
L	Self-Contained Lighting Controls	Includes installation and calibration instructions	~~Yes, no~~ True, False
		Includes indicator lights which consume one watt or more	~~Yes, no~~ True, False
		Meets the requirements of a residential automatic time-switch control	~~Yes, no~~ True, False
		Meets the requirements of a commercial automatic time-switch control	~~Yes, no~~ True, False
		Meets the requirements of an astronomical time-switch control	~~Yes, no~~ True, False
		Meets the requirements of an motion sensor	~~Yes, no~~ True, False
		Meets the requirements of an automatic daylight control	~~Yes, no~~ True, False
		Is integrated with a photo-control	~~Yes, no~~ True, False
		Meets the lighting photo-control requirements	~~Yes, no~~ True, False
		Meets the dimmer control requirements	~~Yes, no~~ True, False
		Meets general occupancy sensor requirements	~~Yes, no~~ True, False
		Is rated for outdoor use	~~Yes, no~~ True, False
		Meets partial on requirements	~~Yes, no~~ True, False
		Meets partial off requirements	~~Yes, no~~ True, False
		Meets vacancy sensor requirements	~~Yes, no~~ True, False
		Uses ultrasonic occupancy detection	~~Yes, no~~ True, False
		If uses ultrasonic occupancy detection, meets ultrasound requirements	~~Yes, no~~ True, False, N/A
		Uses electromagnetic radiation for occupancy detection	~~Yes, no~~ True, False
		If uses electromagnetic radiation for occupancy detection, meets electromagnetic irradiance at 5cm from emitter (mW/cm^2)	~~Yes, no~~ True, False, N/A
M	Traffic Signal Modules for Vehicle control	Module Color	Green, amber, red
		Module Type	Circular, arrow, lane control-arrow, lane control-X, pedestrian, other (specify)
		Modular Size (circular, arrow only)	
		Nominal Wattage at 25° C	
		Maximum Wattage at 74° C	
	Traffic Signal Modules for Pedestrian Control	Module Type	Hand, Walking Person, walk, don't walk, countdown (Specify)
		Power Consumption at 25° C	
		Power Consumption at 74° C	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
N	Torchieres	*Lamp Type of Upward-Facing Lamp(s)	Screw-based Incandescent, Halogen, Fluorescent Pin-based, Other (specify)
		*Lamp Type of Side Lamp(s)	Screw-based Incandescent, Halogen, Fluorescent Pin-based, Other, None (specify)
		Total Number of Lamp Sockets	
		Maximum Possible Power Demand, All Sockets (watts)	
		Method of Insuring 190 Watt Maximum Power Consumption	Current-limiting Device, Thermal Switch, Other (specify)
	Portable Luminaires	Type of Portable Luminaire	Floor, table, other (specify)
		Total Number of lamp sockets	
		Base type	Candelabra base, intermediate base, medium screw-base, pin-base; other (specify)
		Compliance method used	Dedicated fluorescent lamp socket; ~~GU-24~~GU24 line-voltage socket; LED luminaire or light engine; E12, E17, or E26 screw-based socket w/ prepackaged lamp; Halogen lamp socket w/ controls
		Zero standby power (for luminaires with internal power supplies only)	~~Yes, no~~ True, False
		~~GU-24~~GU24 sockets rated (for use with incandescent lamps for luminaires with ~~GU-24~~GU24 sockets only)	~~Yes, no~~ True, False
		LED Light Output (for LED luminaires only)	
		LED Efficacy (for LED luminaires only)	
		Nominal ~~Color~~ Correlated Color Temperature (for LED luminaires only)	
		Color Rendering Index (for LED luminaires only)	
		Power Factor (for LED luminaires labeled or sold for residential use only)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
N	Metal Halide Luminaires	*Lamp Position (orientation)	Vertical Base-Up, Vertical Base-Down, Horizontal, Universal, Other (specify)
		Lamp Rating, low (watts)	
		Lamp Rating, high (watts)	
		Outdoor Luminaire	~~Yes, no~~ True, False
		Compliance Option Used	≥ 90/92% efficient ballast, ≥ 88% efficient ballast with integral control (Occupancy Sensor), ≥ 88% efficient ballast with integral control (Automatic Daylight Control), ≥ 88% efficient ballast labeled for relamping with only 150-160 watt, 200-215 watt, 290-335 watt, or 336-500 watt lamps
		Ballast Type [only applies to models manufactured on or after January 1, 2006]	Probe-start electronic, probe-start magnetic, pulse-start electronic, pulse-start magnetic, other (specify)
		Minimum Ballast Efficiency (percent)	
		Lamp Exceptions[2]	Exception(s) met, no exceptions met
		Integral Control Type (for integral control compliance method only)	Occupancy sensor, Automatic daylight control
		Integral Control Method (for integral control compliance method only)	Directly into luminaire housing Packaged and sold pre-wired Integrated wireless radio controlled sensor
		Maximum relamping rated wattage on a factory-installed label (watts) (for relamping wattage compliance method only)	
		Packaged with efficient lamps (for relamping wattage compliance method only)	~~Yes, no~~ True, False
	Under-Cabinet Fluorescent Fixtures (Luminaires)	Lamp Length (inches)	
		Number of Lamps for which Fixture (Luminaire) is Designed	
		Ballast Efficacy Factor	
O	Dishwashers	*Type	Compact, standard
		* Number of Place Settings	
		Water Heating Dishwasher	~~Yes, no~~ True, False
		Truncated Normal Cycle Capable	~~Yes, no~~ True, False
		Soil Sensing	~~Yes, no~~ True, False
		Maximum Energy Use	
		Maximum Water Use	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
P	Clothes Washers that are ~~federally regulated~~ consumer products	*Type	Front-loading, top loading
		*Controls	Automatic, semi-automatic, other (specify)
		*Axis	Horizontal, vertical
		Suds-Saving	~~Yes, no~~ True, False
		Combination Washer/Dryer[1]	~~Yes, no~~ True, False
		Clothes Container Compartment Capacity	
		Power Consumption Per Cycle[1]	
		Water Consumption Per Cycle	
		Integrated Modified Energy Factor	
		Integrated Water Factor	
		Remaining Moisture Content	
	Commercial Clothes Washers ~~that are not federally-regulated consumer products~~	*Type	Front-loading, top loading
		*Controls	Automatic, semi-automatic, other (specify)
		*Axis	Horizontal, vertical
		Suds-Saving	~~Yes, no~~ True, False
		Combination Washer/Dryer	~~Yes, no~~ True, False
		Clothes Container Compartment Capacity	
		Power Consumption Per Cycle	
		Water Consumption Per Cycle	
		Modified Energy Factor	
		Water Factor (effective for models manufactured before January 1, 2018)	
		Integrated Water Factor (effective for models manufactured on or after January 1, 2018)	
		Remaining Moisture Content (required only on and after January 1, 2004)	
Q	Clothes Dryers	*Energy Source	Gas, electric
		*Drum Capacity	
		*Voltage	120, 240, other (specify)
		Combination Washer/Dryer[1]	~~Yes, no~~ True, False
		Venting	Vented, ventless
		Combined Energy Factor	
		Constant Burning Pilot Light (Gas models only)	~~Yes, no~~ True, False

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
R	Consumer Product Cooking Products	*Type	Conventional range, conventional cooking top, conventional oven, microwave-only oven, countertop convection microwave oven, built-in microwave oven, ~~,~~ over-the-range convection microwave oven, ~~microwave/conventional cooktop, microwave/conventional oven, microwave/conventional range~~combined cooking products, other (specify)
		*Energy Source	Gas, electric, microwave
		Electrical Supply Cord (for gas models only)	~~Yes, no~~ True, False
		~~*~~Constant Burning Pilot Light	~~Yes, no~~ True, False
		Annual Cooking Energy Consumption	
		Annual Self-Cleaning Energy Consumption (for conventional ovens only)	
		Total Annual Energy Consumption (for conventional ovens only)	
		Clock Power Consumption (for gas conventional ovens only)	
		Pilot Light Consumption (for gas conventional ovens only)	
		Annual Secondary Energy Consumption (for gas conventional ovens only)	
		Average Standby Power (data required for various microwave ovens manufactured on or after June 17, 2016 only)	
		Off Mode Power[1]	
		On Mode Power[1]	
	Commercial Convection Ovens	Energy Input Rate	
		Idle Energy Consumption Rate	
	Commercial Hot Food Holding Cabinets	Measured Interior Volume (cu. ft.)	
		Energy Input Rate	
		Idle Energy Consumption Rate	
	Commercial Range Tops	Energy Input Rate	
		Cooking Energy Efficiency	
		Test Cooking Vessel Diameter	
S	Electric Motors	Type (data required for Subtype I, Subtype II, Fire Pump and NEMA Design B motors on or after December 19, 2010 only) ~~(data required for small electric motors manufactured on or after March 9, 2015 only)~~	NEMA Design A, NEMA Design B, IEC Design N, other equivalent design, Multiple-Designs (two or more of NEMA Design A, NEMA Design B, IEC Design N, other equivalent design), General purpose subtype I, General purpose subtype II, Fire pump motor, NEMA Design B general purpose
		Voltage	230, 460, both 230 and 460, multi-voltage (includes 230 or 460)
		Speed[1]	Single, multiple
		Rated Horsepower	
		Input Power	In kilowatts (kW)

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Table X Continued - Data Submittal Requirements

	Appliance		*Required Information*	*Permissible Answers*
S	Electric Motors (cont'd)		Air Exchange	Open, enclosed
			Number of Poles	2, 4, 6, 8
			Nominal Full Load Efficiency	
T	Distribution Transformers		Distribution Transformer type (Data required for liquid-immersed and medium-voltage dry-type on or after January 1, 2010 only)	Low-voltage dry-type; liquid-immersed; medium-voltage dry-type
			*Phase	1, 3
			kVa (BIL kV~~a~~ for medium-voltage dry-type)	
			Rated Output Power	
			Total Loss Power	
			Efficiency (for medium-voltage models, this will be the Efficiency at 20-45 kV)	
			Efficiency 2 (medium voltage models only, Efficiency at 46-95 kV)	
			Efficiency 3 (medium voltage models only, Efficiency at ≥ 96 kV)	
U	External Power Supplies		None	
V	Televisions		Type*	CRT, Plasma, LCD, DLP, Rear Projection, Laser, OLED, LCOS
			Viewable Screen Area	
			Screen Size	
			Automatic Brightness Control	~~Yes, no~~ True, False
			Automatic Brightness Control enabled	~~Yes, no~~ True, False
			Forced Menu	~~Yes, no~~ True, False
			Native Vertical Resolution	
			Aspect Ratio	
			Integrated Occupancy Sensor	~~Yes, no~~ True, False
			L_{home}	
			L_{high}	
			Luminance Ratio	
			TV Standby-Passive Mode Power (watts)	
			On Mode Power (watts)	
			Retail On Mode Power (watts)	
			Power Factor	
	Consumer Audio and Video Equipment	Compact Audio Products	Power Usage in Audio Standby-Passive Mode for Models Without a Permanently-Illuminated Clock Display (watts)	
			Power Usage in Audio Standby-Passive Mode for Models With a Permanently-Illuminated Clock Display (watts)	
		Digital Versatile Disc Players and Digital Versatile Disc Recorders	Power Usage in Video Standby-Passive Mode (watts)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
V	Computer Monitors	Backlight Type	CCFL, LED~~, OLED~~, Quantum Dots, None
		EPD	True, False
		~~EPD sRGB~~	~~True, False~~
		~~EPD Adobe RGB~~	~~True, False~~
		OLED	True, False
		Gaming Monitor w/ Incremental Hardware	True, False
		Gaming Monitor w/o Incremental Hardware	True, False
		KMM_KVM	True, False
		~~KVM~~	~~True, False~~
		~~KMM~~	~~True, False~~
		Very High Performance	True, False
		Curved Monitor	True, False
		Viewable Screen area (square inches)	
		Screen size (diagonal inches)	
		Automatic Brightness Control	True, False
		Automatic Brightness Control Enabled when Shipped	True, False
		Screen Luminance (Candelas Per Square Meter)	
		Native Resolution (megapixels)	
		Power Draw in On Mode (watts)	
		Power Draw in Computer Monitor Sleep Mode (watts)	
		Power Draw in Computer Monitor Off Mode (watts)	
		Touch Screen Capability	True, False
		Touch Screen Enabled in On Mode	True, False
		Touch Screen Enabled in Computer Monitor Sleep Mode	True, False
		Touch Screen Enabled in Computer Monitor Off Mode	True, False
		Color Gamut	>32.9% of CIELUV (99% or more of defined sRGB colors), >38.4% of CIELUV (99% or more of defined Adobe RGB colors), <32.9% of CIELUV
	Medical Computer Monitors	~~* Manufacturer's Name~~	
		~~* Brand Name~~	
		~~* Model Number~~	
		(Other than the identifier information shown under "All Appliances" (e.g., manufacturer name, brand name, model number), no other data is required for medical computer monitors at this time.)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
V	Computers	Computer Type	Desktop, Notebook, Small-Scale Server, Workstation, Thin Client, Portable All-In-One, Mobile Gaming System, Mobile Workstation, High Expandability Computer, Rack-mounted Workstation
		Operating System Type	None, Limited Capability Operating System, Other
		Operating System (Provide the operating system used during testing to calculate energy consumption.)	
		Core Speed (gigahertz)	
		Number of CPU Cores	
		CPU support for 4 or more channels of memory or a 256 bit or greater memory interface	True, False
		Number of 3.5” hard-disk drives and Others (other than main storage)	
		Number of 2.5” hard-disk drives (other than main storage)	
		Number of solid-state drives (other than main storage)	
		Number of hybrid solid-state drives (other than main storage)	
		Nameplate output power of the external power supply (watts) (notebook computers and mobile gaming systems only)	
		Total Battery Capacity (watt-hours) (notebook computers, portable all-in-one, and mobile gaming systems only)	
		Discrete GPU(s) present in system	True, False
		First Discrete GPU is packaged on the same substrate as the CPU	True, False
		First Discrete GPU Frame Buffer Bandwidth (rounded to nearest gigabyte per second)	
		Total Number of Discrete GPUs	
		Integrated Display	True, False
		Color Gamut (if computer has integrated display)	>32.9% of CIELUV (99% or more of defined sRGB colors), >38.4% of CIELUV (99% or more of defined Adobe RGB colors), <32.9% of CIELUV
		Diagonal screen size (inches) (if computer has integrated display)	
		Viewable screen area (square inches) (if computer has integrated display)	
		Resolution (megapixels) (if computer has integrated display)	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
V	Computers (cont'd.)	Enhanced Performance (if computer has integrated display)	True, False
		Length of time of user inactivity before computer entering sleep (minutes). Do not report a number if the model does not enter sleep.	
		Length of time of user inactivity before placing display into sleep (minutes). Do not report a number if the model does not enter sleep.	
		Energy Efficient Ethernet Capability	True, False
		Total Number of Add-in Cards	
		Total Number of Video Surveillance Cards	~~True, False~~
		Total Number of Wired Ethernet or Fiber Cards with a transmit rate of 10 GB/s or greater	~~True, False~~
		System memory bandwidth (gigabytes/second)	
		8 gigabytes or more of system memory with a bandwidth of 632 GB/s or more	True, False
		8 gigabytes or more of system memory with a bandwidth of 432 GB/s or more	True, False
		4 gigabytes or more of system memory with a bandwidth of 146 GB/s or more	True, False
		4 gigabytes or more of system memory with a bandwidth of 134 GB/s or more	True, False
		Total Number of System Memory Channels Used	
		First channel system memory type	DDR, GDDR, HBM, Other
		First channel system memory bandwidth (GB/s)	
		First channel system memory (GB)	
		Second channel system memory type	DDR, GDDR, HBM, Other, None
		Second channel system memory bandwidth (GB/s)	
		Second channel system memory (GB)	
		Third channel system memory type	DDR, GDDR, HBM, Other, None
		Third channel system memory bandwidth (GB/s)	
		Third channel system memory (GB)	
		Fourth channel system memory type	DDR, GDDR, HBM, Other, None
		Fourth channel system memory bandwidth (GB/s)	
		Fourth channel system memory (GB)	
		Fifth channel system memory type	DDR, GDDR, HBM, Other, None
		Fifth channel system memory bandwidth (GB/s)	
		Fifth channel system memory (GB)	
		Sixth channel system memory type	DDR, GDDR, HBM, Other, None
		Sixth channel system memory bandwidth (GB/s)	
		Sixth channel system memory (GB)	
		Seventh channel system memory type	DDR, GDDR, HBM, Other, None

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
V	Computers (cont'd.)	Seventh channel system memory bandwidth (GB/s)	
		Seventh channel system memory (GB)	
		Eighth channel system memory type	DDR, GDDR, HBM, Other, None
		Eighth channel system memory bandwidth (GB/s)	
		Eighth channel system memory (GB)	
		Computer sleep mode type	ACPI S3, Other
		Computer off mode power (watts)	
		Computer sleep mode power (watts)	
		Long-idle power (watts)	
		Short-idle power (watts)	
		Expandability Score	
		Meets full capability mode weighting criteria	True, False
		Meets remote wake mode weighting criteria	True, False
		Total Annual Energy Consumption (kilowatt hours per year)	
		Power Supply Meets Table V-9 or Level VI	True, False
		Small Volume Manufacturer	True, False
		Motherboard model number	
		Power supply type	Internal, External
		Internal power supply size (watts)	
		Power factor at full load of the computer's power supply that is not a federally regulated external power supply	
		Median power factor during short-idle of the computer's power supply that is not a federally regulated external power supply	
		Power supply model number	

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Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
W	Small Battery Charger Systems	*Consumer Product Model Number	End use product model number (specify)
		Product Type	~~AA/AAA battery charger, auto/marine/RV, cell phone, cordless phone, emergency backup lighting, handheld barcode scanner, laptop, personal electric vehicle, portable lighting, two-way radio, uninterruptable power supply, other (specify)~~
		24-hour charge and maintenance energy	
		Battery maintenance mode power	
		No battery mode power	
		Battery capacity of tested battery (if more than 1 charger port report the total of all battery capacities connected during test)	
		Inductive charger systems	~~Yes, no~~ True, False
		Number of charger ports	
		Compatible battery chemistries	
		Battery backup or uninterruptible power supply	~~Yes, no~~ True, False
		Á la carte charger	~~Yes, no~~ True, False
		USB charger system	~~Yes, no~~ True, False
		Location of marking or labeling	Packaging, Product
		Battery Test Procedure Used	
		Consumer Product (T/F)	True, False
	Large Battery Charger Systems	Product Type	~~Single phase lift-truck, three phase lift-truck, other (specify)~~
		Charge return factor 100	
		Charge return factor 80	
		Charge return factor 40	
		Power conversion efficiency	
		Power factor	
		Maintenance mode power	
		No battery mode power	
		Battery capacity of tested battery	
		~~Family certification~~	~~Yes, no~~
		Compatible battery chemistries	
		Location of marking or labeling	Packaging, Product

Table X Continued - Data Submittal Requirements

	Appliance	*Required Information*	*Permissible Answers*
W	Federally Regulated Battery Chargers (manufactured on or after June 13, 2018)	Product Group Code	1, 2, 3, 4, 5, 6, 7
		Nameplate Battery Voltage of Test Battery in Volts (V)	
		Nameplate Battery Charge Capacity of Test Battery in Ampere-Hours (Ah)	
		Nameplate Battery Energy Capacity of Test Battery in Watt-Hours (Wh)	
		Maintenance Mode Power in Watts (Pm)	
		Standby Mode Power in Watts (Psb)	
		Off Mode Power in Watts (Poff)	
		Battery Discharge Energy in Watt-Hours (Ebatt)	
		24-Hour Energy Consumption in Watt-Hours (E24)	
		Duration of the Charge and Maintenance Mode Test in Hours (Tcd)	
		Unit Energy Consumption (UEC) (kWh/yr)	
		Manufacturer of Test Battery	
		Model of Test Battery	
		Manufacturer of External Power Supply (If Applicable)	
		Model of External Power Supply (If Applicable)	

* "Identifier" information as described in ~~S~~section 1602(a) of this Article.
1 = Voluntary for federally-regulated appliances
2 = Voluntary for state-regulated appliances

(4) **Declaration.**

(A) Each statement shall include a declaration, executed under penalty of perjury of the laws of California, that

1. all the information provided in the statement is true, complete, accurate, and in compliance with all applicable provisions of this Article;

2. ~~if the statement is being filed electronically, that~~ the requirements of ~~S~~section 1606(g) of this Article have been and are being complied with;

3. for appliances for which there is an energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, that the appliance complies with the applicable standards;

4. the appliance was tested under the applicable test method specified in ~~S~~section 1604 of this Article, and, for the following appliances, was tested as follows:

~~a. for wine chillers that are consumer products, the appliance was tested to 10 C.F.R. section 430.23(a) with the modifications referenced in Table A-1;~~

~~b~~a. for other self-contained commercial refrigerators, refrigerator-freezers, and freezers with doors that are pass-through and roll-through refrigerators and freezers, that the back (loading) doors remained closed throughout the test;

~~c~~b. for all refrigerators, refrigerator-freezers, and freezers were tested using alternating current electricity only;

~~d~~c. for all split system central air conditioners and compressor-containing units, these models were tested with the non-compressor containing unit most likely to represent the highest national sales volume for the combined equipment;

~~e~~d. for all gas-fired air conditioners and gas-fired heat pumps, all appliances were tested to ANSI Z21.40.4-1996 as modified by CEC, Efficiency Calculation method for Gas-Fired Heat Pumps as a New Compliance Option (1996);

~~f~~e. for evaporative coolers, all appliances were tested to the applicable test method referenced in Table D-~~1~~3 with the modifications appearing in Table D-~~1~~3;

~~g~~f. for whole house fans, all appliances were tested to HVI-916, and if equipped with louvers were tested with manufacturer-provided louvers in place;

~~h. for heat pump pool heaters, all appliances were tested using ANSI/ASHRAE 146-1998, as modified by the Addendum Test Procedure published by the Pool Heat Pump Manufacturers Association as referenced in Table C-1; and~~

~~i~~g. for battery charger systems for which certification is based on testing of representative battery charger system models, the models tested as representative are those known or expected to have the poorest performance characteristics such that the data generated meets the requirements of ~~S~~section 1606(a)(3)(~~E~~D) of this Article for all associated models; and~~.~~

~~j~~h. for kitchen faucets that utilize an optional and temporary higher flow rate than 1.8 gpm, the higher flow rate has been tested utilizing the test procedure identified for kitchen faucets in section 1604(h) at 60 psi and verified to have a flow rate less than or equal to 2.2 gpm.~~ E~~

Exceptions to ~~S~~section 1606(a)(4)(A)4 of this Article: Section 1606(a)(4)(A)4 of this Article is not applicable to the following types of appliances that have no test methods found in ~~S~~section1604 of this Article:

~~(1) large heat pump water heaters~~

~~(2) federally regulated light emitting diode (LED) lamps,~~

(~~3~~1)federally regulated organic light emitting diode (OLED) lamps,

(~~4~~2) federally regulated candelabra base incandescent lamps,

(~~5~~3) federally regulated intermediate base incandescent lamps,

(~~6~~4) traffic signal lamps,

(~~7~~5)torchieres,~~ and~~

(~~8~~6) portable luminaires showing compliance with ~~S~~sections 1605.3(n)(3)(A)1., 1605.3(n)(3)(A)2., or 1605.3(n)(3)(A)5. of this Article, and

(7) self-contained lighting controls.

5. all units of the appliance are marked as required by ~~S~~section 1607 of this Article, and, for the following appliances, are marked as follows:

   a. for all air conditioners, heat pumps, furnaces, boilers, and water heaters that are not subject to NAECA and that comply with the October 29, 2001 provisions in Tables 6.2.1 A through G of ASHRAE/IES Standard 90.1-1999, they are marked, permanently and legibly on an accessible and conspicuous place on the unit, with a statement that the equipment complies with the 2001 requirements of ASHRAE Standard 90.1;

   b. for all other air conditioners, heat pumps, furnaces, boilers, and water heaters that are not subject to NAECA and that comply with the October 29, 1999 provisions (but not with the October 29, 2001 provisions) in Tables 6.2.1 A through G shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, with a statement that the equipment complies with the 1999 requirements of ASHRAE Standard 90.1;

   c. for all distribution transformers, each appliance ~~complies with the labeling requirements of NEMA Standard TP3-2000~~ has a label or nameplate which states "DOE Compliant" or equivalent;

   d. for all illuminated exit signs meeting the criteria of ~~S~~section 1605.1(l) of this Article, each appliance is marked by the manufacturer with a block E inside a circle; the mark commonly referred to as "Circle E." The size of the mark shall be commensurate with other markings on the sign, but not smaller than 1/4";

   e. for all torchieres, each unit of torchieres and each package containing a torchiere is marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/8" on the inner surface of the reflector bowl of the torchiere, and 1/4" on the packaging, "LAMPS MUST TOTAL NO MORE THAN 190 WATTS-TORCHIERE IS NON-COMPLIANT IF IT IS ABLE TO DRAW MORE THAN 190 WATTS.";

   f. for commercial pre-rinse spray valves, each unit is marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/8", the flow rate of the unit, in gallons-per minute (gpm) at 60 psi;

g. for residential pool pumps, each pool pump is marked permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/4", with the nameplate HP of the pump and, if manufactured on or after January 1, 2010, with the statement, "This pump must be installed with a two-, multi-, or variable-speed pump motor controller";

h. for residential pool pump motors, each pool pump motor is marked permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/4", with the pool pump motor capacity of the motor.

(B) If the manufacturer is a corporation, partnership, or other business entity, the declaration shall be electronically signed by an individual authorized to make the declaration and file the statement on behalf of the business entity, and the declaration shall contain an affirmation that the individual signing is so authorized.

(C) The declaration shall be submitted electronically through the MAEDbS and maintained ~~as follows:~~by the Executive Director for a period of at least ten years, pursuant to the requirements in section 1606(i) of this Article.

~~1. Statements filed on paper.~~

~~a. If the statement is filed by a manufacturer, then the manufacturer shall file a wet-signed paper declaration with the Executive Director and the Executive Director shall keep the declaration.~~

~~b. If the statement is filed by a third party under Section 1606(f), then the manufacturer shall file a wet-signed paper declaration with the third party and the third party shall keep the declaration and shall provide it to the Executive Director on request.~~

~~2. Statements filed electronically.~~

~~a. If the information is filed by a manufacturer, then either:~~

~~(i) the manufacturer shall file a wet-signed paper declaration with the Executive Director and the Executive Director shall keep the declaration;~~

~~(ii) if the Executive Director has approved the use of a unique digital identifier for this purpose, the manufacturer shall include in the statement a declaration digitally signed under Government Code 16.5 and Title 2, California Code of Regulations, Division 7, Chapter 10 (beginning with Section 22000); or~~

~~(iii) the manufacturer shall execute a wet-signed paper declaration, electronically scan and copy the declaration, include the electronic copy of the declaration with the statement filed with the Executive Director, and keep the wet-signed paper declaration and provide it upon request to the Commission; and the Commission shall keep the electronic copy of the declaration.~~

~~b. If the information is filed by a third party under Section 1606(f), then either:~~

~~(i) the manufacturer shall file a wet-signed paper declaration with the third party and the third party shall keep the declaration and shall provide it to the Executive Director on request;~~

~~(ii) if the Executive Director has approved the use of a unique digital identifier for this purpose, the manufacturer shall execute a declaration digitally signed under Government Code 16.5 and Title 2, California Code of Regulations, Division 7, Chapter 10 (beginning with Section 22000), and provide the electronic declaration to the third party; and the~~

~~third party shall keep a copy of the electronic declaration and shall provide it to the Executive Director on request; or~~

~~(iii) the manufacturer shall execute a wet-signed paper declaration, electronically scan and copy the declaration, include both the wet-signed paper declaration and the electronic copy of the declaration with the electronic information provided to the third party; the third party shall include the electronic copy with information filed with the Executive Director, shall keep an electronic copy, and shall provide the wet-signed paper declaration to the Executive Director upon request; and the Executive Director shall keep a copy of the electronic declaration.~~

(b) Review of Statements by the Executive Director.

In this subsection, "manufacturer" also includes a third party filing a statement under ~~S~~section 1606(f) of this Article.

(1) **Determination.** The Executive Director shall determine whether a statement is complete, accurate, and in compliance with all applicable provisions of this Article, and whether the appliance for which the statement was submitted complies with all applicable standards in ~~S~~sections 1605.1, 1605.2, and 1605.3 of this Article.

(2) **Informing Manufacturer and ~~t~~Third ~~p~~Party of Determination.**

(A) The Executive Director shall inform the manufacturer's MAEDbS-designated contact person or the third party's MAEDbS-designated contact person, as described in ~~S~~section 1606(f) of this Article, of the determination within 30 calendar days after receipt by the Executive ~~Direcotr~~ Director ~~whether it is filed electronically or on paper~~.

(B) The Executive Director's determination shall be sent electronically through the MAEDbS to the manufacturer's MAEDbS-designated contact person ~~electronically the statement was filed electronically and either electronically or on paper if the statement was filed on paper~~.

(3) **Nature of Determination.**

(A) **Statement is Incomplete.** If the Executive Director determines that a statement is not complete, or that the statement does not contain enough information to determine whether it is accurate or whether the appliance complies with an applicable standard, the Executive Director shall return the statement through the MAEDbS to the manufacturer's MAEDbS-designated contact person with an explanation of its defects and a request for any necessary additional information. The manufacturer shall refile the statement through the MAEDbS with all information requested by the Executive Director ~~and with any other information it wants to file~~. The Executive Director shall review the refiled statement according to the time limits in ~~S~~section 1606(b)(2) of this Article.

(B) **Statement is Inaccurate or Appliance Does Not Comply**. If the Executive Director determines that the statement is inaccurate or that the appliance does not comply with an applicable standard, the Executive Director shall reject the statement and return it through the MAEDbS to the manufacturer's MAEDbS-designated contact person with an explanation of its defects. The manufacturer may submit a revised statement through the MAEDbS for the appliance at any time.

(C) **Statement is Complete and Accurate and Appliance Complies.** If the Executive Director determines that the statement is complete and accurate and that the appliance complies with all applicable standards, the Executive Director shall immediately include the appliance in the ~~database~~MAEDbS and shall so inform the manufacturer's MAEDbS-designated contact person. (~~S~~section 1608(a) of this Article states that no appliance within the scope of these regulations may be sold or offered for sale in California unless the appliance is in the ~~database~~MAEDbS.)

(c) Modernized Appliance Efficiency Database of Appliance Models.

(1) **Creation of ~~Database~~ the MAEDbS.** The Executive Director shall maintain a database known as the Modernized Appliance Efficiency Database (MAEDbS). The ~~database~~MAEDbS shall consist of two parts:

(A) "~~Active Database~~ Approved MAEDbS." The ~~active database~~ Approved MAEDbS shall contain, at least, information on all appliances that are currently in production, for which complete and accurate statements have been received pursuant to ~~S~~section 1606(a) of this Article, and that have not been removed from the ~~database~~MAEDbS pursuant to ~~S~~sections 1606(c)(3), ~~Sections~~ 1606(d)-(e), or 1608(c)-(e) of this Article.

If basic models are certified using an alternate test procedure established pursuant to ~~S~~section 1603(c)(1) of this Article or for which the Executive Director has made a specification under either ~~S~~section 1603(c)(2)(A) or ~~S~~section 1603(c)(2)(B) of this Article, the ~~Active Database~~Approved MAEDbS shall contain a second section which shall contain only those basic models for which certification to an applicable alternate test procedure is made.

(B) "~~Historical Database~~Archived MAEDbS." The ~~historical database~~Archived MAEDbS shall contain, at least, information on all appliances that:

1. are no longer in production, for which complete and accurate statements have been received pursuant to ~~S~~section 1606(a) of this Article or

2. have been removed from the ~~active database~~Approved MAEDbS pursuant to ~~S~~sections 1606(e)(2) or 1608(c) of this Article.

(2) **Status of ~~Database~~ the MAEDbS.** The ~~database~~MAEDbS is the directory published by the Energy Commission within the meaning of Title 24, California Code of Regulations, Ppart 6, Subchapter 1, Section 100(h). The ~~database~~MAEDbS in existence on the effective date of this paragraph is the directory referred to in this paragraph, until that existing ~~database~~MAEDbS is modified by the Executive Director pursuant to this Article.

(3) **Confirmation of ~~Database~~ the MAEDbS Listings.** The Executive Director may, by electronically writing (either via e-mail or directly through the MAEDbS) to the most recent electronic address filed pursuant to ~~S~~section 1606(a)(2)(B) of this Article, request each manufacturer of an appliance listed in the ~~database~~MAEDbS to confirm the validity, or to correct in compliance with this Article, all of the information in each of its ~~database~~MAEDbS listings~~, including but not limited to the appliance's compliance with any applicable standard adopted since the most recent filing by the manufacturer~~. ~~If, within 30 days after the mailing, there is any appliance for which the Executive Director has not received a reply from the manufacturer that confirms the validity of, or corrects, all of the information in the database listing, the Executive Director shall write via certified mail (registered mail to non-U.S. destinations), to the same address.~~ If within 30 calendar days of the ~~latter~~electronic mailing there is no such reply, the appliance shall be removed from the Approved ~~Active Database~~MAEDbS and moved into the ~~Historical Database~~Archived MAEDbS, and it may be presumed that the appliance is no longer in production.

(A) If the lack of compliance with any requirements of this Article is strictly limited to non-compliance with standards adopted since the most recent filing by the manufacturer, after initially notifying the manufacturer under the requirements found in section 1606(c)(3) of this Article, all affected models will be moved from the Approved MAEDbS to the Archived MAEDbS without providing any additional electronic notice to the manufacturer. The effective date for moving such affected models to the Archived MAEDbS will be the effective date of the new standard.

(d) Assessment of Completeness, Accuracy, and Compliance of Manufacturer Statements.

(1) Notwithstanding any other provision of these regulations, the Executive Director may at any time challenge the completeness, accuracy, and compliance with the requirements of this Article, of any statement or confirmation filed pursuant to this Section. If the statement is incomplete or inaccurate, or if the Executive Director determines that the statement otherwise fails to comply with any of the requirements of this Article ~~(including but not limited to non-compliance with standards currently in effect, but not in effect when the statement was filed),~~ then he or she shall, ten working days after providing ~~written~~ electronic notice via e-mail or directly through the MAEDbS ~~by certified mail (registered mail to non-U.S. destinations)~~ to the person designated in ~~S~~section 1606(a)(2)(B) of this Article, remove the appliance from the ~~database~~MAEDbS described in ~~S~~section 1606(c) of this Article

(A) If the lack of compliance with any requirements of this Article is strictly limited to non-compliance with standards currently in effect, but not in effect when the statement was filed, all affected models will be moved from the Approved MAEDbS to the Archived MAEDbS without providing any advance electronic notice to the manufacturer. The effective date for moving such affected models to the Archived MAEDbS will be the effective date of the new standard.

(e) Modified and Discontinued Appliances.

(1) If any of the characteristics listed in Table X are changed, the manufacturer shall file a statement containing ~~only~~ the identifiers and all the ~~modified~~ information for the appliance, including ~~for~~ all the characteristics that have been changed for the appliance. Upon receipt of such a statement, the Executive Director shall review the statement under ~~S~~section 1606(b) of this Article. If the statement is complete, accurate, in compliance with all applicable standards, the Executive Director shall modify the ~~database~~MAEDbS accordingly.

(A) If no data currently certified for a specific appliance has changed, no notification of modification is necessary, nor will it be accepted in MAEDbS.

(2) After any appliance has ceased being sold or offered for sale in California the manufacturer shall file a statement so stating and only containing the identifiers shown in Table X for the appliance. Upon receipt of such a statement, the Executive Director shall review the statement under ~~S~~section 1606(b) of this Article. If the statement is complete, accurate, and in compliance with all applicable provisions of this Article, the Executive Director shall move the appliance from the ~~Active Database~~ Approved MAEDbS to the ~~Historical Database~~Archived MAEDbS.

(A) Section 1606(e)(2) of this Article applies either when:

1. a manufacturer or third-party certifier provides information about deleting a model, or

2. Energy Commission Appliance Efficiency Program staff independent of any manufacturer or third-party certifier determine that an appliance has ceased being sold or offered for sale in California,

(f) Filing by Third Parties.

(1) A third party may file on behalf of a manufacturer the information required by ~~S~~sections 1606(a)(2), 1606(a)(3), 1606(a)(4), 1606(c)(3), or 1606(e) of this Article if:

(A) before or with its first submittal, the third party submits to the Executive Director through the MAEDbS a declaration, under penalty of perjury, that:

1. the third party has read and understood all the provisions of this Article, of federal law, and of all other documents applicable to each appliance category in ~~S~~sections 1601(a)-(w) of this Article for which the third party will file information, including but not limited to updated test procedures, standards and filing requirements; and

2. the third party is financially and technically capable of complying with the applicable provisions of this Article;

(B) before or with the first submittal made by the third party, the manufacturer submits to the third party and Executive Director through the MAEDbS:

1. a declaration under penalty of perjury,

a. that all information provided to the third party by the manufacturer is true, complete, accurate, and in compliance with all applicable provisions of this Article,

b. that no unmodified model data is being submitted,

~~b~~c. that on behalf of the manufacturer, the third party is authorized to file information in compliance with the provisions of this Article, and

~~e~~d. for appliances for which there is an energy efficiency, energy consumption, energy design, water consumption, water efficiency, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, that the model complies with the current applicable standards.

(C) the third party submits to the Executive Director through the MAEDbS, in compliance with the requirements of this Article applicable to manufacturer-filed submittals:

1. the information that is required; and

2. a declaration under penalty of perjury that:

a. to the best of the third party's knowledge and belief, the information submitted to the Energy Commission is the same as the information submitted by the manufacturer to the third party;

b. the information is true, complete, accurate, and in compliance with all applicable provisions of this Article; and,

c. for appliances for which there is an energy efficiency, energy design, water consumption, or water efficiency standard in ~~S~~section 1605. 1, 1605.2, or 1605.3 of this Article, the appliance complies with the applicable standards.

(2) Whether a manufacturer files information required by this Section by itself or via a third party, the manufacturer remains responsible for the truth, accuracy, completeness, and timeliness of all required filings.

(3) Upon a finding of noncompliance with an applicable provision of this Article, the Executive Director may suspend a third party from making filings, allow continued filings under specific conditions or remove affected appliances from the ~~database~~MAEDbS.

(4) If the Executive Director has suspended or revoked the approval of a trade association directory under ~~S~~section 1606(h)(2)(B) of this Article, that trade association is prohibited from being approved as a third party until it has obtained re-approval under ~~S~~section 1606(h)(2)(B) of this Article.

(5) The provisions of this Article are applicable to all submittals and filings, whether made by a manufacturer directly or by a third party on behalf of a manufacturer.

(g) Electronic Filing.

(1) Unless otherwise stated in this Article, the statements and other submittals required or allowed by this Article shall be filed electronically to the MAEDbS by all third parties acting under ~~S~~section 1606(f) of this Article so that~~:~~

~~(A)~~ the electronic filing to the MAEDbS uses a format and characteristics, including without limitation appropriate formatting, that are specified by the Executive Director, and includes a declaration that complies with ~~S~~section 1606(a)(4) of this Article~~;~~

~~(B) within three days of the electronic filing being made, an exact paper copy of all declarations required by Sections 1606(a)(4) or 1606(f)(1)(C)2. is executed by a person authorized under the appropriate section to execute it;~~

~~(C) for two years from the date of filing the person making the filing keeps the exact paper copies required by paragraph (B) immediately above and provides those copies to the Executive Director upon 10 days' written request~~.

(2) Any electronic filing to the MAEDbS constitutes a representation by the person making the filing that:

(A) all applicable requirements of this Article have been met;

(B) the person will electronically acknowledge receipt through the MAEDbS of all electronic communications concerning the filing from the Executive Director through the MAEDbS to the person;

(C) all electronic communications concerning the filing from the Executive Director through the MAEDbS to the person shall be deemed received by the person upon notification to the Executive Director, by the computer from which the Executive Director communication has been sent, that the communication has been sent; and

(D) all electronic communications concerning the filing from the person to the Executive Director shall be deemed received by the Executive Director only upon actual receipt.

(3) At any time the Executive Director may forbid electronic filings by any person, or generically, and may remove affected appliance models from the ~~database~~MAEDbS, if he or she finds that an applicable requirement of this Article is not being met.

(h) Trade Association Directories.

(1) A paper or electronic directory, or a part thereof, published by an appliance trade association may be used for any purpose that the ~~database~~MAEDbS established pursuant to ~~S~~section 1606(c) of this Article is used for, if the Executive Director approves the directory, or part thereof, by determining and confirming that:

(A) the trade association is an approved industry certification program within the MAEDbS and meets all requirements shown in section 1603(b) for each appliance listed in the directory;

(B) all of the applicable requirements of ~~S~~section 1606(f) of this Article for third party submittals are met for the directory;

(C) the entity submits to the Executive Director:

1. all of the information in the directory, within three working days of the approval of the directory;

2. all of the information in the directory that has changed since the previous submittal, at the end of each month during which there has been any change;

3. a declaration, signed under penalty of perjury of the laws of California, that to the best of the trade association's knowledge and belief:

a. the information in the directory is the same as the information submitted by manufacturers to the trade association;

b. the information is true, complete, accurate, and in compliance with all applicable provisions of this Article;

c. each appliance complies with the applicable standards in ~~S~~section 1605.1 of this Article; and

d. for any appliance for which there is a standard in ~~S~~section 1605.3 of this Article, that the appliance meets all applicable standards unless the directory states, in a format approved by the Executive Director (including without limitation font, type size, and placement in the directory), that it is illegal in California to sell the appliance or offer it for sale.

(D) for each appliance that is listed in a trade association directory, the directory includes all of the following information, where applicable to the appliance:

1. manufacturer

2. brand

3. model number as it appears on the appliance

4. type

5. fuel type

6. voltage

7. electrical phase

8. capacity or other size measurement

9. input

10. output

11. standby consumption, loss, or other similar measurement; and energy efficiency,

12. energy consumption, water efficiency, or water consumption;

(E) the directory contains no appliance in the following categories:

1. an appliance that fails to meet an applicable energy efficiency, energy consumption, energy design, water efficiency, or water consumption standard established in or pursuant to NAECA or EPAct;

2. an appliance for which the manufacturer has stated or certified that the appliance meets an energy efficiency, energy consumption, energy design, water efficiency, or water consumption standard not applicable to it; or

3. an appliance that does not, or an appliance whose manufacturer does not, meet an applicable requirement of this Article, unless the directory states, in a format approved by the Executive Director (including without limitation font, type size, and placement in the directory), that it is illegal in California to sell the appliance or offer it for sale; and

(F) each paper or electronic directory contains the following statement, in at least 20 point bolded type and on the front cover or first page, or in another format and with other characteristics as specified by the Executive Director:

"This directory [insert parts if appropriate] has been approved by the California Energy Commission (Energy Commission) for determining compliance with its appliance efficiency regulations (Title 20, California Code of Regulations, ~~S~~sections 1601-~~1608~~1609 of this Article) and its building standards (Title 24, California Code of Regulations, P~~p~~art 6). UNLESS INDICATED OTHERWISE, any appliance listed in this directory [insert parts if appropriate] may be sold, offered for sale, or installed in new construction in California. For appliances manufactured by manufacturers participating in this directory, but who have not given authorization for data submittal to the Energy Commission, this directory cannot be used for determining compliance. For information about such appliances, appliances that are beyond the scope of this directory, or appliances produced by manufacturers who do not participate in this directory, please contact the Appliance Efficiency Program at: <appliances@energy.ca.gov>. Manufacturers not granting authorization for data submittal to the Energy Commission as of the publication date of this directory include [list all affected manufacturers]"; and

(G) at the end of each calendar quarter, the trade association provides, at no cost to recipients, an electronic copy of the current directory or supplement or part thereof to the Executive Director and to all California building officials as specified by the Executive Director, and provides to the Executive Director a list of the building officials to whom the directory or supplement was sent.

(2) If the Executive Director at any time determines that an approved trade association directory does not comply with an applicable provision of this Article, or that any information in a trade association directory is substantially incomplete, inaccurate, or not in compliance with an applicable provision of this Article, then:

(A) upon written notice from the Executive Director the trade association shall immediately indicate in the directory, in a format approved by the Executive Director (including without limitation font, type size, and placement in the directory), that it is illegal in California to sell the appliance. In addition, the Executive Director shall remove the appliance from the Energy Commission's ~~database~~MAEDbS established under ~~S~~section 1606(c) of this Article or indicate in the ~~database~~MAEDbS that the appliance cannot legally be sold or offered for sale in California. The appliance shall be removed from, or indicated in, the Energy Commission's ~~database~~MAEDbS and the trade association directory, for at least sixty days, until the end of a proceeding held to consider the matter pursuant to Sections 11445.10-11445.60 of the California Government Code (or, at the third party or affected manufacturer's option, pursuant to Sections 11425.10-11425.60 of the California Government Code); and

(B) the Executive Director may suspend or revoke the approval of the trade association directory; if approval is revoked, the trade association may not seek re-approval for two years after the revocation.

(3) If the Executive Director takes action under ~~S~~sections 1606(b)(3)(A) or (B), or 1608(c), (d), or (e) of this Article, he or she shall direct that all trade association directories be modified accordingly.

(4) There may be more than one third-party directory for the same appliance.

(i) Retention of Records.

Manufacturers, and third parties or trade associations acting under ~~S~~sections 1606(a), 1606(f), and 1606(g) of this Article, shall retain all data, forms, information, and all other records required by this Article concerning each appliance:

(1) for at least 2 years after the manufacturer informs the Executive Director, in writing, of the cessation of production of the appliance; and

(2) in a manner allowing ready access by the Executive Director on request.

The Executive Director shall retain all data, forms, information, and all other records required by this Article concerning each appliance for at least 10 years after the record is initially filed or reconfirmed.

~~(j) Portable Luminaire Sales Data.~~

~~Beginning January 1, 2013, portable luminaire manufacturers selling products in California shall submit to the Energy Commission annual unit sales of portable non-screw based halogen luminaires sold in California, by major product class. Data for each calendar year shall be submitted no later than May 1 of the following year.~~

(j~~k~~) Small Volume Manufacturers.

(1) Entities seeking to be designated as a "small volume manufacturer" for purposes of Section 1605.3(v)(7) shall certify and retain records to demonstrate the following information:

(A) Gross revenues from the 12-month period preceding the certification from all of the entity's operations, including operations of any other person or business entity that controls, is controlled by, or is under common control of the entity, is $2,000,000 or less; and

(B) The manufacturer assembles and sells the computers at the same location.

(2) If a small volume manufacturer no longer meets one of the requirements to be a small volume manufacturer, the entity shall file to remove itself from the database as a small volume manufacturer within 90 days.

The following documents are incorporated by reference in ~~S~~section 1606.

Number	***Title***
CALIFORNIA ENERGY COMMISSION	
~~California Energy Commission Voluntary California Quality Light-Emitting Diode (LED) Lamp Specification (December 2014)~~	
California Title 24, P<u>p</u>art 6, Joint Appendix 8 JA-8 -- 2015	Qualification Requirements for High Efficacy Light Sources
Copies available from:	California Energy Commission Energy Hotline 1516 Ninth Street, MS-25 Sacramento, California 95814 Phone: (916) 654-5106 FAX: (916) 654-4304
FEDERAL STATUTES AND REGULATIONS	
C.F.R., Title 10, section 430.23(ee) (Appendix BB to subpart B of part 430) (Jan. 1, 2017)	Uniform Test Method for Measuring the Input Power, Lumen Output, Lamp Efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Power Factor, Time to Failure, and Standby Mode Power of Integrated Light-Emitting Diode (LED) Lamps

Copies available from: Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
http://www.gpo.gov

NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)

NEMA SSL 7A (2013)	Qualification Requirements for High Efficacy Light Sources
Copies available from:	National Electric Manufacturers Association 1300 N. 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org Phone: (703) 841-3200 Fax: (703) 841-3300

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c), and 25960, Public Resources Code; and sections 16, 26, and 30, Governor's Exec. Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4, and 25960, Public Resources Code; and section 16, Governor's Exec. Order No. B-29-15 (April 1, 2015).

Section 1607. Marking of Appliances.

(a) Scope of ~~this~~ Section 1607.

Every unit of every appliance within the scope of ~~S~~section 1601 of this Article shall comply with the applicable provisions of this section. The effective dates of this section shall be the same as the effective dates shown in ~~S~~section 1605.1, 1605.2 or 1605.3 of this Article for appliances for which there is an energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article. For appliances with no energy efficiency, energy consumption, energy design, water efficiency, water consumption, or water design standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the effective date of this section shall be January 1, 2006.

(b) Name, Model Number, and Date.

Except as provided in ~~S~~section 1607(c) of this Article, the following information shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit;

(1) manufacturer's name or brand name or trademark (which shall be either the name, brand, or trademark of the listed manufacturer specified pursuant to ~~S~~section 1606(a)(2)(A) of this Article ~~or, if applicable, the designated manufacturer specified pursuant to Section 1606(f)(1)(F))~~;

(2) model number; and

(3) date of manufacture, indicating (i) year and (ii) month or smaller (e.g. week) increment. If the date is in a code that is not readily understandable to the layperson, the manufacturer shall immediately, on request, provide the code to the Energy Commission.

(c) Exceptions to Section 1607(b).

(1) For plumbing fixtures and plumbing fittings, the information required by ~~S~~section 1607(b) of this Article shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit or on the unit's packaging.

(2) For lamps, the information required by ~~S~~section 1607(b) of this Article shall be permanently, legibly, and conspicuously displayed on an accessible place on each unit, on the unit's packaging, or, where the unit is contained in a group of several units in a single package, on the packaging of the group.

(3) For fluorescent lamp ballasts, the date of manufacture information required by ~~S~~section 1607(b)(3) of this Article shall indicate (i) year and (ii) three-month or smaller increment. If the date is in a code that is not readily understandable to the layperson, the manufacturer shall immediately, on request, provide the code to the Energy Commission.

(d) Energy Performance Information.

(1) **Federally- Regulated Consumer Products.**

The marking required by 16 C.F.R. part 305 shall be displayed as required for all federally-regulated consumer products of the following classes:

Refrigerators
Refrigerator-freezers
Freezers

Central air conditioners
Heat pumps
Dishwashers
Water heaters
Room air conditioners
Warm air furnaces
Boilers
Pool heaters
Clothes washers
Fluorescent lamp ballasts
Showerheads
Faucets
Water closets
Urinals
General service incandescent reflector lamps
General service fluorescent lamps
General service incandescent (other than reflector) lamps
Medium-base compact fluorescent lamps
Metal halide lamp fixtures
Televisions
Ceiling fans.

(2) **Federally- Regulated Commercial and Industrial Equipment.**

Unless otherwise specified in Table Y, e~~E~~ach unit of an appliance listed in Table Y that is federally- regulated commercial and industrial equipment shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, with the applicable energy performance information shown in Table Y, and such information shall also be included on all printed material that is displayed or distributed at the point of sale.

Table Y
Requirements for Marking of Federally- Regulated Commercial and Industrial Equipment

Class	*Energy Performance Information*
Split system central air conditioners (on printed material only)	Cooling capacity, SEER, EER
Single package central air conditioners	Cooling capacity, SEER, EER
Split system heat pumps (on printed material only)	Cooling capacity, heating capacity, SEER, EER, HSPF, COP
Single package heat pumps	Cooling capacity, heating capacity, SEER, EER, HSPF, COP
Package terminal air conditioners	Cooling capacity, EER
Package terminal heat pumps	Cooling capacity, heating capacity, EER, COP
Warm air furnaces	Input rating, thermal efficiency
Packaged boilers	Input rating, thermal efficiency, combustion efficiency (combustion efficiency marking requirement applies only to boilers with input ratings greater than 2,500,000 Btu/h.)
Water heaters	Input rating, rated storage volume, measured storage volume, thermal efficiency, standby loss (%/hr), standby loss (Btu/hr)
Hot water supply boilers	Rated input, rated storage volume, measured storage volume, thermal efficiency, standby loss

(3) **Air Conditioners, Heat Pumps, Furnaces, Boilers, and Water Heaters**. Each unit of air conditioners, heat pumps, furnaces, boilers, and water heaters that are not subject to NAECA and that comply with the provisions in Tables 6.8.1 A through F of ANSI/ASHRAE/IES Standard 90.1-2007 shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, with a statement that the equipment complies with the requirements of ASHRAE Standard 90.1.

(4) **Distribution Transformers.** Each unit of distribution transformers shall ~~comply with the labeling requirements of NEMA Standard TP3-2000~~have a label or nameplate which states "DOE Compliant" or equivalent.

(5) **Illuminated Exit Signs.** Each unit of illuminated exit signs meeting the criteria of ~~S~~section 1605.1(l) of this Article that are sold in California (subject to the limitations of ~~S~~section 1601 of this Article) shall be marked by the manufacturer with a block E inside a circle; the mark commonly referred to as "Circle E." The size of the mark shall be commensurate with other markings on the sign, but not smaller than 1/4~~"~~ inch. Signs not meeting section 1605.1(l) of this Article shall not be so marked.

(6) **Luminaires.** Each unit of torchieres and each package containing a torchiere shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/8~~"~~ inch on the inner surface of the reflector bowl of the torchiere, and 1/4" on the packaging, "LAMPS MUST TOTAL NO MORE THAN 190 WATTS - TORCHIERE IS NON-COMPLIANT IF IT IS ABLE TO DRAW MORE THAN 190 WATTS."

(7) **Commercial Pre-Rinse Spray Valves.** Each unit of commercial pre-rinse spray valve shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/8~~"~~ inch, the flow rate of the unit, in gallons-per minute (gpm) at 60 psi.

(8) **External Power Supplies.**

(A) **Federally Regulated External Power Supplies.** Any ~~federally regulated~~ external power supply subject to the standards in section 1605.1(u)(1) of this Article shall be clearly and permanently marked in accordance with 10 C.F.R. section 430.32(w)(4) ~~the International Efficiency Marking Protocol for External Power Supplies, Version 3.0, September 2013~~.

(B) **State-Regulated External Power Supplies.** Any state-regulated external power supply complying with the requirements of ~~S~~section 1605.3(u) shall be clearly and permanently marked in accordance with the International Efficiency Marking Protocol for External Power Supplies, Version 3.0, September 2013.

(9) **Residential Pool Pumps.**

(A) Each residential pool pump shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/4", the nameplate HP of the pump.

(B) Each residential pool pump motor shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/4", the pool pump motor capacity of the motor.

(C) Two-, multi-, or variable-speed residential pool pumps certified under ~~S~~section 1606 of this Article on or after January 1, 2010 shall be marked, permanently and legibly on an accessible and conspicuous place on the unit, in characters no less than 1/4", "This pump must be installed with a two-, multi-, or variable-speed pump motor controller."

(10) **Battery Charger Systems.** Each battery charger system shall be marked with a "BC" inside a circle. The marking shall be legible and permanently affixed to:

(A) the product nameplate that houses the battery charging terminals or;

(B) the retail packaging and, if included, the cover page of the instructions.

(11) **Emergency Lighting and Self-Contained Lighting Controls.** All occupant sensing devices which utilize microwave radiation for detection of occupants shall be marked with an approved Federal Communications Commission identifier. In addition, such devices must have permanently affixed installation instructions recommending that the device be installed at least 12 inches from any area normally used by room occupants.

(12) **Air Filters.** Each unit of air filters manufactured on or after April 1, 2019 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 information specified in either section (A) or (B) below as applicable to the air filter model:

(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. 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 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. 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).

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

Table Z
Sample Air Filter Marking

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

(13)**State-Regulated LED Lamps.** State-regulated LED lamps shall meet the criteria below before making any of the relevant claims in marketing materials, including retail packaging or on the lamp itself.

(A) For lamps manufactured on or after January 1, 2018, the following shall be demonstrated before making a claim of being "dimmable."

~~(1)~~1. The lamp shall be dimmable to 10 percent of its full light output.

~~(2)~~2. The lamp shall be reduced flicker operation;

~~(3)~~3. Shall not produce noise in excess of 24 A-weighted decibels at 100 percent and 20 percent of full light output.

~~(4)~~4. If the product cannot be reduced flicker operation using a standard phase-cut dimmer, but can be reduced flicker operation using another type of dimmer, references to dimmability shall be qualified with the phrase "dimmable with LED dimmer." These lamps shall include instructions on or inside the retail packaging that describe, or contain an internet link to a description of, the type of dimmers that are compatible or recommended for use with the lamp.

(B) State-regulated LED lamps manufactured on or after January 1, 2018 shall meet all of the following requirements before including comparisons to incandescent lamps:

~~(1)~~1. The lamp shall have a ~~color~~ correlated color temperature of 3000~~k~~K or less.

~~(2)~~2. The lamp shall be "dimmable" as described in 1607(d)(13~~2~~)(A) of this Article.

~~(3)~~3. The lamp shall have a lumen output of 310 lumens or greater for medium-screw base lamps or 150 lumens or greater for intermediate and candelabra bases.

Exception to section 1607(d)(13)(B): Section 1607(d)(13)(B) does not apply to incandescent wattage equivalency claims.

(C) If the manufacturer makes incandescent wattage equivalency claims for medium screwbase and GU-24 base omnidirectional state-regulated LED lamps manufactured on or after January 1, 2018, the lamps shall have a minimum lumen output not less than the values shown in Table K-~~1~~510.

Table K-~~15~~10
Incandescent Wattage Equivalences for State-regulated LED Lamps

Incandescent wattage equivalence	*Minimum Lumen Output*
40 W	310
60 W	750
75 W	1050
100 W	1490
150 W	2500

(D) A lamp manufactured on or after January 1, 2018 that is certified with a lumen output of less than 150 lumens for candelabra bases, or less than 200 lumens for other bases, shall be labeled on the retail packaging as "for decorative purposes."
(E) For lamps manufactured on or after February 1, 2017, if the manufacturer makes any marketing, label, or mark regarding a model's qualification for the California Quality LED Lamp Specification, the manufacturer shall certify that the lamp model meets each and every portion of the California Quality LED Lamp Specification.

The following documents are incorporated by reference in ~~S~~section 1607.

Number ***Title***

CALIFORNIA ENERGY COMMISSION

California Energy Commission Voluntary California Quality Light Emitting Diode (LED) Lamp Specification (December ~~2014~~2017)

Copies available from: California Energy Commission
Energy Hotline
1516 Ninth Street, MS-25
Sacramento, California 95814
Phone: (916) 654-5106
FAX: (916) 654-4304

FEDERAL MARKING REQUIREMENTS

C.F.R., Title 16, part 305
C.F.R., Title 10, section 430.32(w)(4)

Copies available from: Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
~~http://ecfr.gpoaccess.gov/~~www.ecfr.gov

International Efficiency Marking Protocol for External Power Supplies, Version 3.0, September 2013

Copies available from: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Forrestal Building,
Mail Station EE-2J,
1000 Independence Avenue, SW.,
Washington, DC 20585-0121

http://www.regulations.gov/contentStreamer?documentId=EERE-2008-BT-STD-0005-0218&disposition=attachment&contentType=pdf

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

ANSI/ASHRAE/IES 90.1-2007	Energy Standard for Buildings Except Low-Rise Residential Buildings
Copies available from:	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle N.E. Atlanta, GA 30329 www.ashrae.org Phone: (800) 527-4723 (U.S./Canada) or (404) 636-8400 FAX: (404) 321-5478

~~**NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION (NEMA)**~~

~~NEMA TP3-2000~~	~~Standard for the Labeling of Distribution Transformer Efficiency~~
~~Copies available from:~~	~~National Electric Manufacturers Association 1300 N. 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org Phone: (703) 841-3200 FAX: (703) 841-3300~~

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Reference: Sections 25216.5(d), 25402(a)-25402(c), and 25960, Public Resources Code.

Section 1608. Compliance, Enforcement, and General Administrative Matters.

(a) General Requirements for the Sale or Installation of All Appliances.

Any unit of any appliance within the scope of ~~S~~section 1601 of this Article may be sold or offered for sale in California only if:

(1) the appliance appears in the most recent ~~database~~MAEDbS established pursuant to ~~S~~section 1606(c) of this Article, unless the only reason for the appliance's absence from the ~~database~~MAEDbS is its failure to comply with an applicable standard in ~~S~~section 1605.1 of this Article;

(2) the manufacturer has:

(A) tested the appliance as required by ~~S~~sections 1603 and 1604 of this Article;

(B) marked the unit as required by ~~S~~section 1607 of this Article;

(C) for any appliance for which there is an applicable standard in ~~S~~section 1605.2 or 1605.3 of this Article, certified under ~~S~~section 1606(a) of this Article that the appliance complies with the standard;

(3) the unit has the same components, design characteristics, and all other features that affect energy or water consumption or energy or water efficiency, as applicable, as the units that were tested under ~~S~~sections 1603 and 1604 of this Article and for which information was submitted under ~~S~~section 1606(a) of this Article; and

(4) for any appliance for which there is an applicable standard in ~~S~~section 1605.2 or 1605.3 of this Article, the unit complies with the standard.

Exceptions~~:~~ to Sections 1608(a)(1) and 1608(a)(2)(C) of this Article. Sections 1608(a)(1) and 1608(a)(2)(C) of this Article are not applicable to:

1. external power supplies,

~~2. walk-in coolers and walk-in freezers,~~

~~3. low-profile ceiling fans, or~~

2. compressors,

3. small electric motors, or

4. à la carte chargers meeting the EXCEPTION noted in ~~S~~section 1605.3(w)(2) of this Article.

(b) Appliances Not in ~~Database~~ the MAEDbS.

If the Executive Director determines that an appliance requiring certification that is not in the ~~database~~MAEDbS is being sold or offered for sale in California, he or she shall take appropriate legal

action to restrain and discourage such sale or offering, including, but not limited to testing units of the appliance at the manufacturer's cost and seeking appropriate judicial action.

(c) All Appliances: Submittal of Reports of Manufacturers' Certification Testing.

(1) For any appliance, the Executive Director may at any time request from a manufacturer a copy of the test report that describes the results of the testing that was performed pursuant to ~~S~~section 1604 of this Article and that provides the basis for the information submitted under ~~S~~section 1606(a)(3)(C) of this Article. The request shall be sent to the ~~address or~~ e-mail address designated in ~~S~~section 1606(a)(2)(B) of this Article. If ~~the appliance is a commercial refrigerator, commercial refrigerator-freezer, commercial freezer, large storage water heater, or plumbing fitting, or if~~ the Executive Director includes with the request information that, in his or her opinion, constitutes substantial evidence that the appliance or the manufacturer is not in compliance with an applicable provision of this Article, or that the energy or water performance of the appliance is not as certified under ~~S~~section 1606(a)(3)(C)) of this Article or is not as required by an applicable standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, then the manufacturer shall provide a copy of the applicable test report to the Executive Director within 5 days of the manufacturer's receipt of the request.

(2) If the Executive Director does not receive the test report within the required time, the Executive Director shall remove the appliance from the ~~database~~MAEDbS.

(3) If the test report indicates that the energy or water consumption of the appliance is greater than, or the energy or water efficiency of the appliance is less than, the consumption or efficiency certified by the manufacturer pursuant to ~~S~~section 1606(a)(3)(C) of this Article, the Executive Director shall, after providing ~~written~~ electronic notice via e-mail or directly through the MAEDbS ~~by certified mail (registered mail to non-U.S. destinations)~~ to the person designated in ~~S~~section 1606(a)(2)(B) of this Article, modify the listing of the appliance in the ~~database~~MAEDbS to reflect accurately the test report.

(4) If the test report indicates that the appliance model does not comply with an applicable standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the Executive Director shall, ten days after providing ~~written~~ electronic notice via e-mail or directly through the MAEDbS ~~by certified mail (registered mail to non-U.S. destinations)~~ to the person designated in ~~S~~section 1606(a)(2)(B) of this Article, remove the model from the ~~database~~MAEDbS.

(d) Inspection by the Executive Director of Appliances Subject to Energy Design and Water Design Standards, and Marking Requirements.

(1) The Executive Director shall periodically inspect appliances sold or offered for sale in the state, to determine whether they conform with the applicable energy design and water design standards of ~~S~~sections 1605.1, 1605.2, and 1605.3 of this Article, and with the applicable marking requirements of ~~S~~section 1607 of this Article.

(2) Inspection of an appliance shall consist of inspection of one unit.

(A) If the inspection indicates that the unit complies with the applicable energy or water design standards and marking requirements, the matter shall be closed.

(B) If the inspection indicates that the unit does not comply with an applicable energy or water design standard or as applicable marking requirement, the Energy Commission shall undertake a proceeding pursuant to Sections 11445.10-11445.60 of the California Government

Code (or, at the manufacturer's option, pursuant to Sections 11425.10-11425.60 of the California Government Code). If the Energy Commission confirms the Executive Director's determination, then he or she shall remove the appliance from the ~~database~~MAEDbS.

(e) Executive Director's Enforcement Testing of Appliances Subject to Energy Efficiency, Energy Consumption, Water Efficiency, and Water Consumption Standards.

The Executive Director shall periodically cause, at laboratories meeting the criteria of ~~S~~section 1603(a) of this Article, the testing of appliance units sold or offered for sale in the state, to determine whether the appliances conform with the applicable standards in ~~S~~sections 1605.1, 1605.2, and 1605.3 of this Article, and to determine whether their performance is as reported or certified by the manufacturer pursuant to ~~S~~section 1606(a) of this Article. Testing shall be performed as follows:

(1) **Initial Test.** The Executive Director shall perform an initial test on one unit, using the applicable test procedure specified in ~~S~~section 1604 of this Article. Upon completion of the initial test, the Executive Director shall make a determination as follows:

(A) **Performance Is No Worse Than Required by Standards and Is No Worse Than as Certified by Manufacturer or Third-Party Certifier.** If the initial test result indicates that the energy and water consumption of the unit is no greater than, and the energy and water efficiency of the unit is no less than, the consumption or efficiency that is permitted and required by all applicable standards in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, and that was certified by the manufacturer or third-party certifier pursuant to ~~S~~section 1606(a) of this Article, the matter shall be closed.

(B) **Performance Is Worse Than Required by Standard or Is Worse Than as Certified by Manufacturer or Third-Party Certifier.** If the initial test result indicates that the energy or water consumption of the unit is greater, or the energy or water efficiency of the unit is less, than the consumption or efficiency that is permitted or required by any applicable standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, or that was certified by the manufacturer or third-party certifier pursuant to ~~S~~section 1606(a) of this Article, the Executive Director shall perform a second test on a second unit, using the applicable test procedure specified in ~~S~~section 1604 of this Article.

(2) **Second Test; Mean of Results.** If a second test is performed, the Executive Director shall calculate the mean of the results of the initial test and the second test. Upon completion of the second test, the Executive Director shall inform the manufacturer of the results and shall make a determination as follows:

(A) **Performance Is No Worse Than Required by Standards and Is No Worse Than as Certified by Manufacturer or Third-Party Certifier.** If the two test results indicate that the mean energy and water consumption of the two units is no greater than, and the mean energy and water efficiency of the two units is no less than, the consumption and efficiency permitted or required by all applicable standards in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, and that was certified by the manufacturer or third-party certifier pursuant to ~~S~~section 1606(a) of this Article, the matter shall be closed.

(B) **Performance is As Required by Standard but is Worse Than as Certified by Manufacturer or Third-Party Certifier.** If the two test results indicate that the mean energy or water consumption of the two units is greater than, or the mean energy or water efficiency of the two units is less than, the consumption or efficiency that was certified by the manufacturer or third-party certifier pursuant to ~~S~~section 1606(a) of this Article, but that the mean result nevertheless complies with all applicable standards in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the Energy Commission shall undertake a proceeding pursuant to

Sections 11445.10-11445.60 of the California Government Code (or, at the manufacturer's option, pursuant to Sections 11425.10-11425.60 of the California Government Code). If the Energy Commission determines that the two test results indicate that (1) the mean energy or water consumption of the two units is greater than, or the mean energy or water efficiency of the two units is less than, the consumption or efficiency as reported or certified by the manufacturer pursuant to ~~S~~section 1606(a) of this Article, and (2) the mean result nevertheless complies with all applicable standards in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, then the Executive Director shall modify the listing of the appliance in the ~~database~~MAEDbS to reflect accurately the Energy Commission's determination.

(C) **Performance is Not As Required by Standard.** If the two test results indicate that the mean energy or water consumption of the two units is greater than, or the mean energy or water efficiency of the two units is less than, any applicable standard in ~~S~~section 1605.1, 1605.2, or 1605.3 of this Article, the Energy Commission shall undertake a proceeding pursuant to Sections 11445.10-11445.60 of the California Government Code (or, at the manufacturer's option, Sections 11425.10-11425.60 of the California Government Code). If the Energy Commission determines that the mean energy or water consumption of the two units is greater than, or the mean energy or water efficiency of the two units is less than any applicable standard, the Executive Director shall remove the appliance from the ~~database~~MAEDbS established pursuant to ~~S~~section 1606(c) of this Article.

(3) **Optional Method of Determining Energy or Water Performance.** If, at any time before an Energy Commission determination under ~~S~~section 1608(e)(2)(B) or 1608(e)(2)(C) of this Article, the manufacturer so chooses, instead of using the mean-of-two-units approach set forth in ~~S~~sections 1608(e)(1) and 1608(e)(2) of this Article, the Executive Director shall test the appliance using the sampling method set forth in 10 C.F.R. part 429~~,~~ Appendix A (for consumer products and certain high-volume commercial equipment), Appendix B (for covered equipment and certain low-volume covered products), or Appendix C (for distribution transformers) to ~~S~~subpart C of part 429 and shall make the determinations under ~~S~~sections 1608(e)(1) and 1608(e)(2) of this Article based on those test results. The manufacturer shall pay for all such testing.

(f) Costs.

Except as otherwise provided in this Article, all costs of initial tests showing results as described in ~~S~~section 1608(e)(1)(A) or ~~S~~section 1608(e)(2)(A) of this Article shall be borne by the Energy Commission. All costs of all other tests shall be paid by the manufacturer.

(g) Federally-Regulated Appliances.

If:

(1) the appliance tested is a federally-_regulated consumer product or federally-_regulated commercial and industrial equipment; and

(2) either:

(A) the test results show that the appliance does not comply with an applicable federal standard or other applicable federal requirement; or

(B) the test results are at variance with the results reported by the manufacturer to the U.S. Department of Energy or the U.S. Federal Trade Commission; then, in addition to taking the applicable actions described in ~~S~~sections 1608(e)(1) and 1608(e)(2) of this Article, the Executive Director shall inform the appropriate federal agency.

(h) Forms and Formats Specified by Executive Director.

The Executive Director may specify, and require the use of, any particular form or format for the submittal of any data, reports, or other information required by this Article, including but not limited to computer programs or formats.

(i) Executive Director Determinations.

Whenever this Article refers to a finding, conclusion, or other determination by the Executive Director, any person seeking such a determination shall submit to the Executive Director a written request. Within 10 days of receipt of a request, the Executive Director shall either find the request is complete and so inform the applicant, or return the request to the applicant with a statement of what additional information is necessary to make it complete. Within 21 days of receipt of a complete request, the Executive Director shall make a determination, which shall be within the discretion of the Executive Director acting on the basis of the entire record, which shall be assembled and made publicly available by the Executive Director. Within 10 days of a determination, whether made in response to a request or made on the Executive Director's own initiative, any affected person, including but not limited to the person, if any, who made a request for the determination, may appeal the determination to the Energy Commission in writing. At the same time that the appeal is filed, the appellant shall file all the evidence the appellant wishes the Energy Commission to consider. The Energy Commission ~~Staff~~staff and any affected person shall file all the evidence they wish the Energy Commission to consider within 20 days after the appeal is filed. The Energy Commission shall hear and decide the appeal at the next regularly-_scheduled business meeting that is at least 30 days after the appeal is filed. At the hearing the Energy Commission may require the filed evidence to be presented under oath and may allow questions and cross-examination from participants.

The following document~~s are~~is incorporated by reference in ~~S~~section 1608.

Number ***Title***

FEDERAL ENFORCEMENT SAMPLING METHOD

C.F.R., Title 10, part 429, Appendices A, B, and C

Copies available from: Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

~~http://ecfr.gpoaccess.gov/~~www.ecfr.gov

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-(c)~~,~~ and 25960, Public Resources Code. Reference: Sections 25216.5(d), 25402(a)-(c)~~,~~ and 25960, Public Resources Code.

Section 1609. Administrative Civil Penalties.

(a) Violations Subject to Administrative Civil Penalties.

(1) Any person, including a retailer, manufacturer, contractor, importer or distributor, that sells or offers for sale an appliance, which is not listed in the ~~Appliance Efficiency Database~~MAEDbS, is in violation of ~~S~~section 1608(a)(1) of this Article and may be subject to an administrative civil penalty for each unit of the appliance that was sold or is offered for sale.

(2) Any person who manufactures, imports or distributes an appliance that is subsequently sold or offered for sale by another person for end use in California, when the manufacturer has not tested, marked or certified the appliance, in violation of ~~S~~sections 1608(a)(2)(A), 1608(a)(2)(B), or 1608(a)(2)(C) of this Article, or when the appliance does not meet the efficiency standards referred to in ~~S~~sections 1608(a)(3) and 1608(a)(4) of this Article, may be subject to an administrative civil penalty for each unit of the appliance that was sold or is offered for sale, unless the manufacturer, distributor or importer can demonstrate both that the appliance was intended for shipment and use outside of California, and that the manufacturer, distributor or importer took reasonably prudent precautions to assure that the appliance would not be sold or offered for sale in California.

(3) Any person who knowingly provides materially false information to the Energy Commission in a statement made pursuant to any provision of this Article that includes a declaration, executed under penalty of perjury, may be subject to an administrative civil penalty. This may be in addition to any administrative civil penalty assessed pursuant to ~~S~~sections 1609(a)(1) or 1609(a)(2) of this Article. The Energy Commission may consider the making of a false statement in a declaration submitted under penalty of perjury to be evidence of willfulness under ~~S~~section 1609(b)(3)(E) of this Article.

(b) Assessment of Administrative Civil Penalties.

(1) An administrative civil penalty of up to the maximum amount provided by Section 25402.11 of the Public Resources Code may be assessed for each unit of the appliance that was sold or is offered for sale in California in violation of ~~S~~section 1608(a) of this Article, pursuant to ~~S~~sections 1609(a)(1) or 1609(a)(2) of this Article, or for each false statement, pursuant to ~~S~~section 1609(a)(3) of this Article.

(2) If more than one person is responsible for a sale or offer for sale in violation of ~~S~~section 1608(a) of this Article, the Energy Commission may apportion liability amongst the persons responsible for the violation.

(3) In determining the amount of an administrative civil penalty for each violation, the Energy Commission shall consider the following factors:
   (A) The nature and seriousness of the violation.
   (B) The persistence of the violation, meaning a responsible person's history of past violations of this Article over the previous seven years.
   (C) The number of violations arising from the course of conduct that is the subject of the enforcement proceeding.
   (D) The length of time over which the violation occurred.
   (E) The willfulness of the persons responsible for the violation.
   (F) The harm to consumers and to the state that resulted from the amount of energy wasted due to the violation.
   (G) The number of persons responsible for the violation.
   (H) The efforts of the persons responsible for the violation to correct the violation prior to initiation of an enforcement action by the Energy Commission.
   (I) The cooperation, by persons responsible for the violation, with the Energy Commission during its investigation.
   (J) The assets, liabilities, and net worth of the persons responsible for the violation. This information will be considered to reduce the administrative civil penalty amount, should a

responsible person or persons elect to provide asset, liability, and net worth documentation to the Executive Director to demonstrate that a reduction in a penalty amount is necessary to avoid an undue burden.

(c) Notices of Violation.

The Executive Director, or his or her designee, shall send a written Notice of Violation by certified mail (registered mail to non-U.S. destinations) or other means that provide actual notice to the person in violation of this Article. The Notice of Violation shall contain the following information:

(1) The name and address of the person responsible for the violation;
(2) A statement indicating the statute, regulation, order, or decision upon which the Notice of Violation is based, including any provisions relating to the assessment of administrative civil penalties;
(3) A statement of facts upon which the Notice of Violation is based, including a description of the appliances or units of appliances at issue and a reference to model numbers.

(d) Settlement.

Consistent with California Government Code Section 11415.60, the Energy Commission may at any time issue a decision by settlement with a responsible person. The settlement agreement may include appropriate sanctions and remedies to address violations and promote compliance.

(e) Administrative Proceedings.

(1) No earlier than 30 days after issuing a Notice of Violation, the Executive Director may initiate an adjudicative proceeding to impose administrative civil penalties if the Executive Director determines that the responsible person has not made sufficient progress in addressing the violations identified in the Notice of Violation.
(2) The proceeding shall be initiated by filing and serving an accusation as specified in California Government Code Section 11505. The accusation shall include an assessment of penalties based on the factors set forth in subsection (b)(3), and may include other information from the Notice of Violation.
(3) The proceeding shall be conducted in a manner consistent with Chapter 4.5 (commencing with Section 11400) and Chapter 5 (commencing with Section 11500) of ~~P~~part 1 of Division 3 of Title 2 of the California Government Code.
(4) The proceeding shall be heard by an administrative law judge pursuant to Government Code Section 11517(c), unless the Chair orders that the proceeding be heard directly by the Energy Commission with the assistance of an Administrative Law Judge pursuant to California Government Code Section 11517(b).
(5) After the hearing referenced in ~~subsection (e)(4)~~ section 1609(e)(4) of this Article, the Energy Commission shall issue or adopt a decision on whether a violation of this article has been committed, and assess appropriate penalties based on application of the factors set forth in ~~subsection (b)(3)~~ section 1609(b)(3) of this Article ~~above~~.

(f) Other Enforcement Procedures.

The Executive Director and Energy Commission may take other such actions as are authorized by statute and Energy Commission regulations to address or prevent any act or omission addressed under this Article.

(g) Judicial Review.

An order of the Energy Commission imposing an administrative civil penalty shall be subject to judicial review pursuant to Public Resources Code Sections 25534.2(a) and 25534.2(b).

Note: Authority cited: Sections 25213, 25218, and 25402.11, Public Resources Code. Reference: Sections 25402 and 25402.11, Public Resources Code.