Title 21 of the Official Compilation of Codes, Rules and Regulations of the State of New York is amended by adding a new Part 509 to read as follows:

Part 509. Appliance and Equipment Efficiency Standards

Section 509.1 Scope and Purpose

(a) The New York State Legislature has found that increasing energy efficiency in residential and commercial buildings by increasing the use of energy efficient appliances will have significant impacts on the environment and natural resources by reducing energy consumption and limiting greenhouse gas emissions. The provisions of this Part shall apply to any product of the types listed herein that is determined to be a new product, which is sold, or offered for sale, leased or offered for lease, rented or offered for rent, or installed or offered for installation in New York State unless pre-empted by federal appliance standards in effect for such product. For purposes of this Part, a product is a *new product* if its date of manufacture is on or after the effective date of such standard or such other date as may be determined in accordance with specific standards herein.

(b) The purpose of this Part is to (1) establish appliance and equipment efficiency standards and certification procedures; (2) promulgate new technical specifications and testing protocols for the certification, and enforcement of such appliance and equipment efficiency standards for the products and items listed herein; and (3) establish performance metrics and/or prescriptive design requirements associated with each regulated category of products set forth herein in order to reduce energy consumption, reduce water consumption, and reduce greenhouse gas emissions associated with energy consumption and/or increase demand flexibility. This Part implements the "Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022" and extends the requirement to meet efficiency standards to multiple products.

Section 509.2 Definitions

For the purposes of this Part:

(a) *Energy Star* means a government-backed symbol for energy efficiency that is run by the United States Environmental Protection Agency.

(b) *ANSI* means American National Standards Institute, a private non-profit organization that oversees standards and conformity assessment activities in the United States.

(c) *AHAM* means Association of Home Appliance Manufacturers, represents manufacturers in the home appliance industry and helps to bring efficient appliances into homes.

(d) *UL* means an EPA-recognized Certification Body that can carry out product qualification and verification to ENERGY STAR requirements.

(e) *IEC* means International Electrotechnical Commission, a global, not-for-profit membership organization, whose work underpins quality infrastructure and international trade in electrical and electronic goods.

(f) *CADR* means Clean Air Delivery Rate, a measure of the amount of contaminant-free air delivered by the room air cleaner.

(g) *ECOS* means Environmental Council of the States, a national nonprofit, nonpartisan association of state and territorial environmental agency leaders.

(h) *EPRI* means Electric Power Research Institute, an independent non-profit energy research, development, and deployment organization with 14 offices around the world, including three specialized labs.

(i) *ASTM* formerly known as the American Society for Testing and Materials, means an international standards organization that develops and publishes voluntary consensus standards.

(j) *ACPI* means Advanced Configuration and Power Interface, a power management specification developed by Intel, Microsoft, and Toshiba.

(k) *ITU* means International Telecommunication Union, the United Nations specialized agency for information and communication technologies.

(l) *ISO* means International Organization for Standardization, an independent, non-governmental international organization with a membership of 167 national standards bodies.

(m) *IEEE* means Institute of Electrical and Electronics Engineers, an organization dedicated to advancing innovation and technological excellence for the benefit of humanity, is the world's largest technical professional society.

(n) *IETF* means Internet Engineering Task Force, a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

(o) *SGIP* means Smart Grid Interoperability Panel, a vehicle for NIST to solicit input and cooperation from private and public sector stakeholders in developing the smart grid standards framework.

(p) *NIST* means The National Institute of Standards and Technology, a physical sciences laboratory and non-regulatory agency of the United States Department of Commerce.

(q) *IES* means Illuminating Engineering Society which is an industry-backed, not-for-profit, focused on improving the lighted environment by bringing together those with lighting knowledge and by translating that knowledge into actions that benefit the public.

Section 509.3 Air Purifier Efficiency Standards

(a) The following definitions refer to air purifiers:

(1) *air purifier*, also known as room air cleaner, means an electric, cord-connected, portable appliance with the primary function of removing particulate matter from the air and which can be moved from room to room.

(2) *industrial air purifier* means an indoor air cleaning device manufactured, advertised, marketed, labeled, and used solely for industrial use that is marketed solely through industrial supply outlets or businesses and prominently labeled as “Solely for industrial use. Potential health hazard: emits ozone.”

(b) Standard requirements for air purifiers. Air purifiers, except industrial air purifiers, shall meet the following requirements, consistent with the standard levels from ENERGY STAR V1.2 specification for Air Purifiers, as incorporated by reference:

(1) clean air delivery rate for smoke shall be 30 or greater;

(2) for models with a clean air delivery rate for smoke less than 100, clean air delivery rate per watt for smoke shall be greater than or equal to 1.7;

(3) for models with a clean air delivery rate for smoke greater than or equal to 100 and less than 150, clean air delivery rate per watt for smoke shall be greater than or equal to 1.9;

(4) for models with a clean air delivery rate for smoke greater than or equal to 150, clean air delivery rate per watt for smoke shall be greater than or equal to 2.0;

(5) for ozone-emitting models, measured ozone shall be less than or equal to 50 parts per billion (ppb);

(6) for models with a Wi-Fi network connection enabled by default when shipped, partial on mode power shall not exceed 2 watts; and

(7) for models without a Wi-Fi network connection enabled by default when shipped, partial on mode power shall not exceed 1 watt.

(c) Test Methods.

(1) Test methods identified in Table 1 of this subdivision shall be used to determine compliance with the standards in subdivision (b) of this section.

Table 1: Test Method for Air Cleaners

ENERGY STAR Requirement	Test Method Reference
Cigarette Smoke CADR	ANSI/AHAM AC-1-2020: Method of Measuring the Performance of Portable Household Electric Room Air Cleaners, as incorporated by reference in Section 509.61.
Measurement of Operating Power	
Ozone Generation	UL 867 ED. 5.0 Electrostatic Air Cleaners.
Measured Partial on Mode Power ($P_{Partial\_On}$)	IEC 62301 Ed. 2.0 Household electrical appliances – Measurement of standby power, as incorporated by reference in Section 509.61.

Section 509.4 Commercial Battery Chargers Efficiency Standards

(a) The following definitions refer to commercial battery chargers:

(1) *Commercial battery charger systems* (CBCS) or *state-regulated BCS* means a battery charger coupled with its batteries or battery chargers coupled with their batteries, including all rechargeable batteries, or devices incorporating a rechargeable battery, and the chargers used with them. CBCS include, but are not limited to:

(i) 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;

(ii) the battery and battery charger components of devices that are designed to run on battery power during part or all of their operations;

(iii) dedicated battery systems primarily designed for electrical or emergency backup; and

(iv) devices whose primary function is to charge batteries, along with the batteries they are designed to charge.

(2) These units include chargers for power tool batteries and chargers for automotive, AA, AAA, C, D, or 9V rechargeable batteries, as well as chargers for batteries used in larger industrial motive equipment and à la carte chargers.

(3) 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. State-regulated battery charger systems do not include federally regulated battery chargers that are covered under standards in 10 CFR section 430.32(z), as incorporated by reference in Section 509.61.

(4) *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.

(b) Standard requirements for commercial battery chargers. Large battery charger systems shall meet the applicable performance values in Table 2 and as is consistent with the efficiency levels established in. the California Code of Regulations, Title 20, section 1605.3(g)(6), as incorporated by reference in Section 509.61.

Table 2: Requirements for Large Battery Charger Systems

Performance Parameter		Standard
Charge Return Factor (CRF)	100 percent, 80 percent Depth of discharge	Shall be $\leq$ 1.10
	40 percent Depth of discharge	Shall be $\leq$ 1.15
Power Conversion Efficiency		Shall be $\geq$ 89 percent
Power Factor		Shall be $\geq$ 0.90
Maintenance Mode Power (E_b = battery capacity of tested battery)		Shall be $\leq$ 10 + 0.0012E_bW
No Battery Mode Power		Shall be $\leq$ 10 W

(c) Test procedures for assuring compliance with the standards established in subdivision (b) of this section.

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:

(1) 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:

(i) the charge profile with the largest charge return factor;

(ii) the smallest rated battery capacity; and

(iii) the lowest voltage battery available at that rated capacity.

(2) The battery manufacturer's recommended end of discharge voltage may be used in place of values in Energy Efficiency Battery Charger System Test Procedure Version 2.2 part 1, section III.F, Table D, dated November 12, 2008, where the table's values are not applicable.

Section 509.5 Commercial Dishwashers Efficiency Standards

(a) The following definitions refer to commercial dishwashers:

(1) *commercial dishwasher* means a machine designed to clean and sanitize plates, pots, pans, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing rinse and are not a "Compact Dishwasher" or "Standard Dishwasher" (capacity less than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1, using the test load specified in section 2.7 of appendix C in subpart B of 10 CFR 430.32, as incorporated by reference in Section 509.61).

(2) *stationary rack machine* means a dishwashing machine in which a rack of dishes remains stationary within the machine while subjected to sequential wash and rinse sprays. This definition also applies to machines in which the rack revolves on an axis during the wash and rinse cycles.

(i) *under counter* means a stationary rack machine with an overall height of 38 inches or less, designed to be installed under food preparation workspaces. Under counter dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.

(ii) *single tank,* Door Type means a stationary rack machine designed to accept a standard 20 inch x 20 inch dish rack which requires the raising of a door to place the rack into the wash/rinse chamber. Closing of the door typically initiates the wash cycle. Subcategories of single tank, stationary door type machines include: single rack, double rack, pot, pan and utensil washers, chemical dump type and hooded wash compartment ("hood type"). Single tank, door type models can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.

(iii) *pot, pan, and utensil* means a stationary rack, door type machine designed to clean and sanitize pots, pans, and kitchen utensils.

(iv) *glasswashing* means a stationary rack, under counter machine specifically designed to clean and sanitize glasses

(3) *conveyor machine* means a dishwashing machine that employs a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays within the machine.

(i) *single tank* Conveyor means a conveyor machine that includes a tank for wash water followed by a sanitizing rinse (pumped or fresh water). This type of machine does not have a pumped rinse tank. This type of machine may include a prewashing section ahead of the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the power rinse and

sanitizing rinse sections. Single tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.

(ii) *multiple tank conveyor* means a conveyor type machine that includes one or more tanks for wash water and one or more tanks for pumped rinse water, followed by a sanitizing rinse. This type of machine may include a pre-washing section before the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the power rinse and sanitizing rinse section. Multiple tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.

(iii) *flight type conveyor* means a conveyor machine where the dishes are loaded directly on the conveyor rather than transported within a rack. This machine is also referred to as a rackless conveyor.

(4) *hot water sanitizing (high temp) machine* means a machine that applies hot water to the surfaces of dishes to achieve sanitization.

(5) *chemical sanitizing (low temp) machine* means a machine that applies a chemical sanitizing solution to the surfaces of dishes to achieve sanitization.

(6) *chemical dump type machine* means a low temp, stationary rack machine with a pumped recirculated sanitizing rinse.

(7) *dual sanitizing machine* means a machine designed to operate as either a high temp or low temp machine.

(8) *wash mode* means for stationary rack machines, the dishwasher is in wash mode when it is actively running a cycle and is spraying wash water (i.e., water that is neither part of the sanitizing rinse, post sanitizing rinse, nor the prewashing unit).

(9) *rinse mode* means for stationary rack machines, the dishwasher is in rinse mode when it is at the end of the actively running cycle and is spraying hot water or chemical sanitizing rinse water or a postsanitizing rinse. If there is a post-sanitizing rinse, it shall be included in rinse mode.

(10) *dwell mode* means for stationary rack machines, the dishwasher is in dwell mode when it is actively running a cycle but is not in wash or rinse modes.

(11) *idle mode* means for all dishwasher types, the dishwasher is in idle mode when it is not actively running but is still powered on and ready to wash dishes at the required temperature.

(12) *energy saver mode* means a dishwasher is in energy saver mode if the dishwasher is manually converted or, after inactivity, the dishwasher automatically converts to a setting that consumes less energy than it does in idle mode (not all dishwashers have this feature).

(13) *idle energy rate* means the rate of energy consumed by the dishwasher while "holding" or maintaining wash tank water at the thermostat(s) set point during the time period specified in the ENERGY STAR Test Method for Commercial Dishwashers (Rev. May-2012), as incorporated by reference in Section 509.61.

(14) *product family* means the variations of one model offered within a single product line with design differences limited to: finish/color; length of pre-wash section, voltage, and orientation (e.g., corner, straight through models). Individual models represented by a product family must have the same sanitizing and post sanitizing rinse water and idle energy consumption.

(15) *included products* means the products that meet the definition of a Commercial Dishwasher as specified herein are subject to the requirements of subdivision (b) of this section, with the exception of products listed in paragraph (16) of subdivision (a) of this section. The following product types are eligible: under counter; single tank, door type; single tank conveyor; multiple tank conveyor and flight type machines. Glass washing machines; pot, pan, and utensil machines; and dual sanitizing machines

are also eligible. Only those under counter machines designed for wash cycles of 10 minutes or less are eligible for New York compliance. This standard only covers electric models.

(16) *excluded products* means dishwashers intended for use in residential or laboratory applications are exempted from New York standards under this product specification. Steam, gas, and other non-electric models are also exempted from the standard.

(17) Water Consumption is measured based on dishwasher type, see standard requirements below.

(b) Standard requirements for commercial dishwashers.

(1) Energy and Water Efficiency Requirements:

Table 3: Requirements for Commercial Dishwashers

Machine Type	High Temp Efficiency Requirements		Low Temp Efficiency Requirements	
	Idle Energy Rate*	Water Consumption**	Idle Energy Rate*	Water Consumption**
Under Counter	≤ 0.30 kW	≤ 0.86 GPR	≤ 0.25 kW	≤ 1.19 GPR
Stationary Single Tank Door	≤ 0.55 kW	≤ 0.89 GPR	≤ 0.30 kW	≤ 1.18 GPR
Pot, Pan, and Utensil	≤ 0.90 kW	≤ 0.58 GPSF	n/a	n/a
Single Tank Conveyor	≤ 1.20 kW	≤ 0.70 GPR	≤ 0.85 kW	≤ 0.79 GPR
Multiple Tank Conveyor	≤ 1.85 kW	≤ 0.54 GPR	≤ 1.00 kW	≤ 0.54 GPR
Single Tank Flight Type	Reported	GPH ≤ 2.975x + 55.00	n/a	n/a
Multiple Tank Flight Type	Reported	GPH ≤ 4.96x + 17.00	n/a	n/a

*Idle results should be measured with the door closed and represent the total idle energy consumed by the machine including all tank heater(s) and controls. Booster heater (internal or external) energy consumption should not be part of this measurement unless it cannot be separately monitored per the ENERGY STAR Test Method.

**GPR = gallons per rack; GPSF = gallons per square foot of rack; GPH = gallons per hour; x = maximum conveyor speed (feet/min as verified through NSF 3 certification) x conveyor belt width (feet).

(2) User-Adjustable Conveyor Machines: Conveyor machines that offer multiple speeds adjustable by the end user must meet the ENERGY STAR V2.0 requirements, as incorporated by reference in Section 509.61, using the maximum conveyor speed setting tested to and certified to NSF/ANSI Standard 3, as incorporated by reference in Section 509.61. Water consumption values using the maximum conveyor speed setting shall be used for qualification purposes. Water consumption using the slowest conveyor speed shall also be reported to EPA.

(3) Dual Sanitizing Machines: As defined in paragraph (7) of subdivision (a) of this section, these machines shall meet both the high temp and low temp requirements presented in Table 3, in paragraph (1) of this subdivision.

(4) Dual Purpose Door Type Machines: Machines designed to be used either as a standard door type machine or a pot, pan, and utensil machine shall meet the performance requirements for both of those subcategories.

(5) Post Sanitizing Machines: Machines offering a post sanitizing rinse will be evaluated for New York compliance with the post sanitizing rinse turned on during testing. The final rinse water consumption will include both sanitizing and post sanitizing rinses.

(6) Industry Standard Certifications: All machines shall be certified to the NSF/ANSI 3-2010, as incorporated by reference in Section 509.61, the NSF/ANSI 3-2019, as incorporated by reference in Section 509.61, or the current NSF/ANSI 3 Standard, Commercial Warewashing Equipment, as incorporated by reference in Section 509.61.

(7) Significant Digits and Rounding:

(i) All calculations shall be carried out with directly measured (unrounded) values.

(ii) Unless otherwise specified, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.

(iii) Directly measured or calculated values that are submitted for rep.

(c) Test procedures for assuring compliance with the standards established in subdivision (b) of this section.

(1) Representative models shall be selected for testing per the following requirements:

(i) For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For qualification of a product family, the most energy consumptive unit within the product family as defined in paragraph (16) of subdivision (a) of this section shall serve as the representative model.

(2) When testing commercial dishwashers, the following test methods shall be used:

Table 4: Test Method for Commercial Dishwashers

Requirement	Test Method Reference
Idle Energy Rate, GPH, GPR, and GPSF (all machines)	ENERGY STAR V2.0 Test Method for Commercial Dishwashers (Rev. May-2012), as incorporated by reference in Section 509.61
OR	
Dishwasher Category	Test Method Reference
Under-counter; stationary single tank door; pot-pan-utensil	ASTM F1696-20, Standard Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines, as incorporated by reference in Section 509.61
Single tank conveyor; multiple tank conveyor; single tank flight; multiple tank flight	ASTM F1920-20, Standard Test Method for Energy Performance of Rack Conveyor Commercial Dishwashing Machines, as incorporated by reference in Section 509.61

Section 509.6 Commercial Fryers Efficiency Standards

(a) The following definitions apply to commercial fryers.

(1) *commercial fryer* means an appliance for non-residential use, including a cooking vessel, in which oil is placed to such a depth that the cooking food is essentially supported by displacement of the cooking fluid rather than by the bottom of the vessel. Heat is delivered to the cooking fluid by means of an immersed electric element of band-wrapped vessel (electric fryers) or by heat transfer from gas burners through either the walls of the fryer or through tubes passing through the cooking fluid (gas fryers).

(i) *standard fryer* means a fryer with a vat that measures >12 inches and < 18 inches wide, and a shortening capacity > 25 pounds and < 65 pounds.

(ii) *large vat fryer* means a fryer with a vat that measures > 18 inches and < 24 inches wide, and a shortening capacity > 50 pounds.

(iii) *split vat fryer* means a standard or large vat fryer with an internal wall that separates the vat into two equal sides.

(2) *cooking-energy efficiency* means the quantity of energy input to the food product (i.e., french fries) during the cooking process, expressed as a percentage of the quantity of energy input to the fryer during the heavy-load tests.

(3) *idle energy rate* means the average rate of energy consumed [Btu/h (kJ/h) or kW] by the fryer while "holding" or "idling" the frying medium at the thermostat(s) set point.

(4) *product family* means the variations of one model are offered within a single product line with differences in aesthetics only. Individual models represented by a product family must be based on the same basic engineering design and have the same cooking-energy efficiency and idle energy rate. All members of the family must also have the same fry pot size.

(b) Standard requirements for commercial fryers, as is consistent with the efficiency levels established by ENERGY STAR V. 2.0 for Commercial Fryers, as incorporated by reference in Section 509.61.

(1) Determining Fry Pot Size: The frying area shall be measured at the fryer's maximum fill-line. The fry pot width is considered to be the distance between the inner side walls of the frypot. The dimensions for split-vat fryers shall be considered to be twice the width of one side. For kettle fryers,

the frying area shall be measured at the fryer's maximum fill-line using the diameter of the cylinder and determined by the inner walls.

(2) Cooking Energy Efficiency and Idle Energy Rate Requirements – Standard Fryers

Table 5: Requirements for Standard Open Deep-Fat Gas Fryers

Heavy-Load Cooking Energy Efficiency	≥ 50%
Idle Energy Rate	≤ 9,000 Btu/hr

Table 6: Requirements for Standard Open Deep-Fat Electric Fryers

Heavy-Load Cooking Energy Efficiency	≥ 83%
Idle Energy Rate	≤ 800 watts

(3) Cooking Energy Efficiency and Idle Energy Rate Requirements – Large Vat Fryers

Table 7: Requirements for Large Vat Open Deep-Fat Gas Fryers

Heavy-Load Cooking Efficiency	≥ 50%
Idle Energy Rate	≤ 12,000 Btu/hr

Table 8: Requirements for Large Vat Open Deep-Fat Electric Fryers

Heavy-Load Cooking Efficiency	≥ 80%
Idle Energy Rate	≤ 1,100 watts

(4) Significant Digits and Rounding:

(i) All calculations shall be carried out with directly measured (unrounded) values.

(ii) Unless otherwise specified below, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.

(iii) Directly measured or calculated values that are submitted for reporting on the State Appliance Standard Database shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

(c) Test procedures for assuring compliance with the standards established in Section 509.6(b).

(1) Representative models shall be selected for testing per the following requirements:

(i) For certification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For certification of a product family, any model within that product family can be tested and serve as the representative model.

(2) When testing commercial fryers, the following test methods shall be used:

Table 9: Test Method for Commercial Fryers

Requirement	Test Method Reference
Cooking-Energy Efficiency	Standard Fryers: ASTM Standard F1361-07 (2013), Test Method for Performance of Open Deep Fat Fryers, as incorporated by reference in Section 509.61 Large Vat Fryers: ASTM Standard F2144-09, Test Method for Performance of Large Open Vat Fryers, as incorporated by reference in Section 509.61
Idle Energy Rate	

Section 509.7 Commercial Hot Food Holding Cabinet Efficiency Standards

(a) The following definitions refer to commercial hot food holding cabinets:

(1) *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.

(i) "*commercial hot food holding cabinet*" does not include heated glass merchandising cabinets, drawer warmers or cook-and-hold appliances.

(2) *idle energy rate–dry* means the rate of appliance energy consumption while it is maintaining or holding at the control set point, without using a humidity-generating device (if applicable).

(3) *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.

(4) *heated transparent merchandising cabinets* means an appliance with a heated compartment that is designed to display and maintain the temperature of hot food that has been cooked in a separate appliance.

(5) *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.

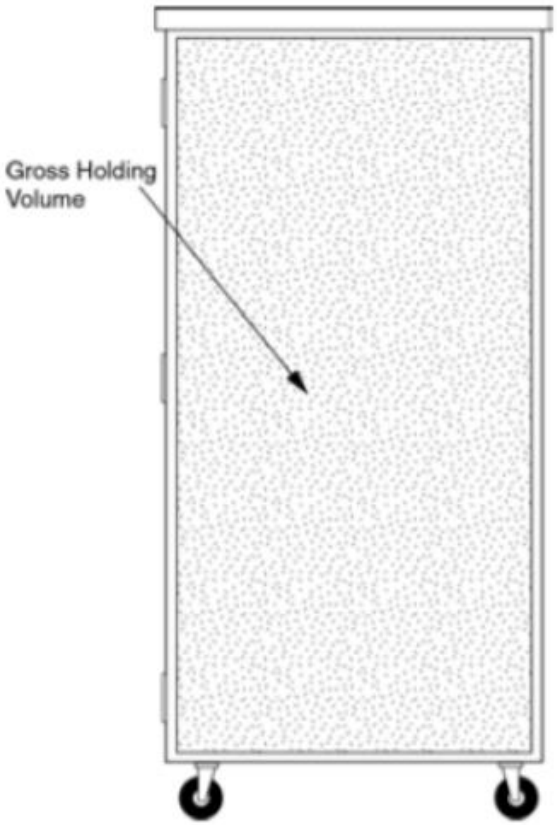
(6) *proofing cabinet* means an enclosed mobile, portable, or stationary appliance designed to maintain the proper temperature and relative humidity for supporting fermentation of dough products by yeast.

(7) *product family* means models built based on the same basic engineering design with the same interior cabinet volume. Units within the family may differ in regard to energy consumption as long

as cabinet size remains constant. Qualification of the product family shall be based on a representative model, as defined in subdivision (c) of this section.

(b) Standard requirements for commercial hot food holding cabinets, as is consistent with the efficiency levels established by ENERGY STAR V. 2.0 specification for Commercial Hot Food Holding Cabinets, as incorporated by reference in Section 509.61.

(1) Measuring Cabinet Interior Volume: Commercial hot food holding cabinet interior volume shall be calculated using straight-line segments following the gross interior dimensions of the appliance and using Equation 1 below. Interior volume shall not account for racks, air plenums or other interior parts.



Equation 1: *Interior Volume = Interior Height x Interior Width x Interior Depth*

(2) Maximum Idle Energy Rate Requirements:

Table 10: Requirements for Maximum Idle Energy Rate

Product Interior Volume (Cubic Feet)	Product Idle Energy Consumption Rate (Watts)
$0 < V < 13$	$\leq 21.5\ V$
$13 \leq V < 28$	$\leq 2.0\ V + 254.0$
$28 \leq V$	$\leq 3.8\ V + 203.5$

Note: V = Interior volume in cubic feet (ft^3)

(3) Significant Digits and Rounding:

(i) All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Calculated results shall be rounded to the tenth decimal point.

(ii) Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.

(c) Test procedures for assuring compliance with the standards established in Section 509.7(b).

(1) Representative models shall be selected for testing per the following requirements:

(i) For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For qualification of a product family, the most energy consumptive unit within the product family (defined in Section 1) shall serve as the representative model.

(2) When testing commercial hot food holding cabinets, the following test methods shall be used:

Table 11: Test Method for Commercial Hot Food Holding Cabinets

Requirement	Test Method Reference
Idle Energy Rate	ASTM Standard F2140-11, Test Method for the Performance of Hot Food Holding Cabinets, as incorporated by reference in Section 509.61

Section 509.8 Commercial Ovens Efficiency Standards

(a) The following definitions refer to commercial ovens:

(1) *commercial oven* means a chamber designed for heating, roasting, or baking food by conduction, convection, radiation, and/or electromagnetic energy.

(2) *combination oven* means a device that combines the function of hot air convection (oven mode), saturated and superheated steam heating (steam mode), and combination convection/steam mode for moist heating, to perform steaming, baking, roasting, rethermalizing, and proofing of various food products. In general, the term combination oven is used to describe this type of equipment, which is self-contained. The combination oven is also referred to as a combination oven/steamer, combi or combo.

(i) *half-size combination oven* means a combination oven capable of accommodating a single 12 x 20 x 2 ½-inch steam table pan per rack position, loaded from front-to-back or lengthwise.

(ii) *full-size combination oven* means a combination oven capable of accommodating two 12 x 20 x 2 ½-inch steam table pans per rack position, loaded side by side, from front-to-back or lengthwise.

(iii) *2/3-size combination oven* means a combination oven capable of accommodating a single 12 x 10 x 2 ½-inch steam table pan per rack position, loaded from front-to-back or lengthwise.

(3) *convection oven* means a general-purpose oven that cooks food by forcing hot dry air over the surface of the food product. The rapidly moving hot air strips away the layer of cooler air next to the food and enables the food to absorb the heat energy. For the purposes of this specification, convection ovens do not include ovens that have the ability to heat the cooking cavity with saturated or superheated steam. However, this oven type may have moisture injection capabilities (e.g., baking ovens and moisture-assist ovens). Ovens that include a hold feature are eligible under this standard as long as convection is the only method used to fully cook the food.

(i) *half-size convection oven* means a convection oven that is capable of accommodating half-size sheet pans measuring 18 x 13 x 1-inch.

(ii) *full-size convection oven* means a convection oven that is capable of accommodating standard full-size sheet pans measuring 18 x 26 x 1-inch.

(4) *conventional or standard oven* means an oven that cooks food primarily using the naturally occurring hot air currents to transfer heat over the surface of the food product without the use of a fan or blower. The burner or elements heat the air within the oven cavity as well as the cavity walls, causing currents of hot air that transfer heat to the surface of the food. The hot air's buoyancy carries it upward through cooler air, which then slowly sinks to the bottom of the oven as it cools off.

(5) *conveyor oven* means an oven designed to carry food product on a moving belt into and through a heated chamber.

(6) *slow cook-and-hold oven* means an oven designed specifically for low-temperature (e.g., less than 300°F) cooking, followed by a holding period at a specified temperature.

(7) *deck oven* means an oven that cooks food product directly on the floor of a heated chamber. The bottom of each compartment is called a deck and heat is typically supplied by burners or elements located beneath the deck. The oven ceiling, floor, and walls are designed to absorb heat quickly and radiate that heat back slowly and evenly.

(8) *rack oven* means a high-capacity oven that offers the ability to produce steam internally and is fitted with a motor-driven mechanism for rotating multiple pans inserted into one or more removable or fixed pan racks within the oven cavity.

(i) *mini rack oven* means a stand-mounted rack oven designed with a load-in-place rack that cannot be removed. Mini rack ovens are capable of accommodating up to 10 standard full-size sheet pans measuring 18 x 26 x 1-inch.

(ii) *single rack oven* means a floor-model rack oven that is able to accommodate one removable single rack of standard sheet pans measuring 18 x 26 x 1-inch. These ovens are also referred to as “roll in” ovens.

(iii) *double rack oven* means a floor-model rack oven that is able to accommodate two removable single racks of standard sheet pans measuring 18 x 26 x 1-inch, or one removable double-width rack.

(iv) *quadruple rack oven* means a floor-model rack oven that is able to accommodate four removable single racks of standard sheet pans measuring 18 x 26 x 1-inch, or two removable double-width racks.

(9) *range oven* means an oven base for a commercial range top (i.e., burners, electric elements or hobs). Range ovens may use either standard or convection technologies to cook food.

(10) *rapid cook oven* means an oven that utilizes one or more non-traditional heat transfer technologies to cook food product significantly faster than would be possible using conventional (e.g., convection, conduction, radiant) heat transfer technologies. Heat transfer technologies that may be employed include microwave, quartz halogen, and high-velocity or impingement convection.

(11) *rotisserie oven* means an oven fitted with a mechanism to move or turn food past a fixed heat source while the food is slowly being cooked on all sides.

(12) *baking-energy efficiency* means the quantity of energy imparted to the specified load, expressed as a percentage of energy consumed by the oven during the baking event.

(13) *cooking-energy efficiency* means the quantity of energy imparted to the specified load, expressed as a percentage of energy consumed by the oven during the cooking event.

(14) *idle energy rate* means the rate of oven energy consumption while it is maintaining or holding at a stabilized operating condition or temperature. Also called standby energy rate.

(15) *total idle energy rate* means the rate of oven energy consumption while it is maintaining or holding at a stabilized operating condition or temperature. Total idle energy rate includes gas and electric energy (primary and auxiliary). Also called total standby energy rate.

(16) *average water rates* means the ratio of the average potable water used to the maximum number of steam table pans the oven can accept during heavy-load cooking in steam and convection modes; expressed as gallons per hour (GPH) per pan.

(17) *average condensate temperature* means the average temperature of the condensed steam and cooling water mixture exiting the combination oven and directed to the drain during heavy-load cooking in steam and convection modes.

(18) *maximum condensate temperature* means the maximum temperature of the condensed steam and cooling water mixture exiting the combination oven and directed to the drain during heavy-load cooking in steam and convection modes.

(19) *product family* means the individual models offered within a product line based on the same engineering design, including pan capacity, fuel type, and method of steam generation, as applicable. Acceptable differences within a product family for purposes of certification include controls, door opening orientation, and any aesthetic additions that have no impact on oven energy consumption in any operating mode.

(20) *pan capacity* means the number of steam table pans the combination oven is able to accommodate as per the ASTM F-1495-05, ASTM F-1495-14, or ASTM F-1495-20, as incorporated by reference in Section 509.61, standard specification.

(21) *single racks* shall accommodate 15 full-size sheet pans measuring 18 x 26 x 1-inch, at a 4-inch spacing between rack positions. Single racks accommodate 1 full-size sheet pan per rack position.

(22) *double-width racks* shall accommodate 30 full-size sheet pans measuring 18 x 26 x 1-inch, at a 4-inch spacing between rack positions. Double racks accommodate 2 full-size sheet pan per rack position.

(23) *set-back idle mode*: A feature that includes automatic temperature reduction after extended periods of non-use. In addition, the feature may also incorporate the reduction or elimination of fan speed, lighting, and automated rack rotation during periods of non-use.

(24) *included products* means the products that meet the definitions of a Commercial Oven and Convection Oven, Combination Oven, or Rack Oven as specified herein are subject to the requirements of subdivision (b) of this section, with the exception of products listed in paragraph (25) of subdivision (a) of this section. To ensure only commercial ovens qualify under this specification, products shall be third-party certified to NSF/ANSI Standard 4, Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment, as incorporated by reference in Section 509.61. The following sub-types are eligible:

(i) Full-size gas and half- and full-size electric convection ovens.

(ii) Half- and full-size gas combination ovens with a pan capacity $\geq$ 6.

(iii) Half- and full-size electric combination ovens with a pan capacity $\geq$ 5 and $\leq$ 20.

(iv) Single and double gas rack ovens.

(25) *excluded product*s: This standard is intended for commercial food-grade ovens. Ovens designed for residential or laboratory applications are exempted from this standard under this specification. The following oven types and sub-types are exempted from the New York standards:

(i) Half-size gas convection ovens.

(ii) 2/3-size combination ovens.

(iii) Dual-fuel heat source combination ovens.

(iv) Hybrid ovens not listed in paragraph (24) of subdivision (a) of this section, such as those incorporating microwave settings in addition to convection.

(v) Conventional or standard ovens; conveyor; slow cook-and-hold; deck; range; rapid cook; and rotisserie.

(vi) Gas combination ovens with a pan capacity of < 6.

(vii) Electric combination ovens with a pan capacity < 5 and > 20.

(viii) Mini and quadruple gas rack ovens.

(ix) Electric rack ovens.

(b) Standard requirements for commercial ovens, as is consistent with the efficiency levels established by ENERGY STAR V. 2.2 Specification for Commercial Ovens, as incorporated by reference in Section 509.61.

(1) Convection Oven Cooking-Energy Efficiency and Idle Energy Rate Requirements:

Table 12: Requirements for Convection Oven Cooking Efficiency and Idle Energy

Gas		
Oven capacity	Idle Rate, Btu/h	Cooking-Energy Efficiency, %
Full-size	≤ 12,000	≥ 46
Electric		
Oven Capacity	Idle Rate, kW	Cooking-Energy Efficiency, %
Half-size	≤ 1.00	≥ 71
Full-size	≤ 1.60	

(2) Combination Oven Cooking-Energy Efficiency and Idle Energy Rate Requirements:

Table 13: Requirements for Combination Oven Cooking Efficiency and Idle Energy

Gas		
Operation	Idle Rate, Btu/h	Cooking-Energy Efficiency, %
Steam Mode	≤ 200P+6,511	≥ 41
Convection Mode	≤ 150P+5,425	≥ 56
Electric		
Operation	Idle Rate, kW	Cooking-Energy Efficiency, %
Steam Mode	≤ 0.133P+0.6400	≥ 55
Convection Mode	≤ 0.80P+0.4989	≥ 76

Note: P= Pan capacity

(3) Rack Oven Baking-Energy Efficiency and Idle Energy Rate Requirements:

Table 14: Requirements for Rack Oven Baking Energy and Idle Energy

Gas		
Oven Size	Total Energy Idle Rate, Btu/h	Baking-Energy Efficiency, %
Single	≤ 25,000	≥ 48
Double	≤ 30,000	≥ 52

(4) Additional Idle Calculation Guidance: Compliance with the Convection Oven and Combination Oven idle rate requirements shall be based on gas energy only for purposes of qualifying gas models. When calculating the gas oven idle rates, electric energy consumed by auxiliary components shall not be taken into consideration. However, the electric energy consumption measured during idle tests shall be reported separately, as per paragraph (3) of subdivision (c) of this section.

(5) Additional Total Idle Calculation Guidance: Compliance with the Rack Oven total idle rate requirements shall be based on gas and electric energy for purposes of qualifying gas models. When calculating the gas rack oven total idle rates, electric energy consumed by auxiliary components shall be converted to Btu/h and added to the gas idle rate expressed in Btu/h. The electric energy consumption measured during idle tests shall also be reported separately as expressed in kW, as per paragraph (3) of subdivision (c) of this section.

Example: Consider a double-sized gas rack oven with a gas idle energy rate of 30,000 Btu/h; and the electric idle energy rate of 1.5 kW. First convert the 1.5 kW electric idle energy rate to Btu/h by multiplying the 1.5 kW by 3,412.142. Then add the result to the 30,000 Btu/h gas idle rate.

1 kW = 3,412.142 Btu/h

Electric idle energy rate, converted to Btu/h: 1.5 kW x 3,412.142 Btu/h = 5,118.213 Btu/h

Total idle energy rate: 30,000 Btu/h + 5,118.213 Btu/h = 35,118.213 Btu/h

(6) Significant Digits and Rounding:

(i) All calculations shall be carried out with directly measured (unrounded) values. Only the final result of a calculation shall be rounded.

(ii) Unless otherwise specified in this specification, compliance with specification limits shall be evaluated using exact values without any benefit from rounding.

(iii) Cooking and Baking-Energy Efficiency: Calculated values that are submitted for reporting on the State Appliance Standard Database shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

(iv) Idle Energy Rate: Calculated values for gas convection, combination, and rack oven idle rates that are submitted for reporting on the State Appliance Standard Database shall be rounded to the nearest whole number. The calculated energy consumption values for electric convection and combination ovens shall be rounded to 0.01 for idle rates.

(c) Test procedures for assuring compliance with the standards established in Section 509.8(b).

(1) Representative models shall be selected for testing per the following requirements:

(i) For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For qualification of a product family, any model within that product family can be tested and serve as the representative model. When submitting product families, manufacturers continue to be held accountable for any efficiency claims made about their products, including those not tested or for which data was not reported.

(2) When testing commercial ovens, the following test methods shall be used:

Table 15: Test Method for Commercial Ovens

Oven Category	Requirement	Test Method Reference
Convection Ovens	Cooking-Energy Efficiency, Idle Energy Rate, and Production Capacity	ASTM F1496-13, Standard Test Method for Performance of Convection Ovens, as incorporated by reference in Section 509.61
Combination Ovens	Cooking-Energy Efficiency, Idle Energy Rate, Production Capacity, and Water Consumption	ASTM F2861-14, Standard Test Method for Enhanced Performance of Combination Oven in Various Modes, as

		incorporated by reference in Section 509.61
Rack Ovens	Baking-Energy Efficiency, Idle Energy Rate, and Production Capacity	ASTM F2093-11, Standard Test Method for Performance Rack Ovens, as incorporated by reference in Section 509.61

(3) For ovens with variable Btu/h or kW input, each available input shall be tested and reported individually. Ovens need to meet the idle energy rate or total idle energy rate, and cooking- or baking-energy efficiency requirements presented in Table 12 of paragraph (1) of subdivision (b) of this section; Table 13 of paragraph (2) of subdivision (b) of this section; or Table 14 of paragraph (3) of subdivision (b) of this section, of this specification at each input setting.

(4) For electric ovens with multiple voltage-versatility and those that are available in different voltage configurations, the representative oven shall be tested at the most energy consumptive voltage according to the manufacturer.

(5) If the representative combination oven model under test is designed to hold 18 x 26-inch sheet pans, manufacturer-supplied wire racks shall be positioned in the oven to accommodate 12 x 20 x 2 1 /2-inch steam table pans.

(6) Combination ovens with roll-in, removable racks shall have the racks positioned in place during steam mode and convection mode idle tests.

(7) For the steam mode idle and cooking-energy efficiency tests, the combination oven shall be manually set to operate at a nominal temperature of 212°F.

(8) Additional Reporting Requirements:

(i) The average water consumption rates, the average condensate drain temperatures, and the maximum condensate drain temperatures shall be reported for all combination ovens. If the oven does not require condensate cooling water during convection mode operation, then it shall be reported as "0".

(ii) The production capacity for all convection oven, combination oven, and rack oven cooking or baking-energy efficiency tests shall be reported.

(iii) The electric energy idle rate for gas convection, combination, and rack oven idle rate tests shall be reported.

(iv) Rack ovens that include energy saving feature(s) and that meet the minimum requirement of the set-back idle mode definition in paragraph (23) of subdivision (a) of this section shall be reported.

Section 509.9 Commercial Steam Cookers Efficiency Standards

(a) The following definitions refer to commercial steam cookers:

(1) *commercial steam cooker*, also known as *compartment steamer*, means a device for non-residential use with one or more food-steaming compartments in which the energy in the steam is transferred to the food by direct contact. Models may include countertop models, wall-mounted models, and floor models mounted on a stand, pedestal, or cabinet-style base.

(2) *cooking energy efficiency* means the quantity of energy input to the food products; expressed as a percentage of the quantity of energy input to the appliance during the heavy-, medium-, and light-load tests.

(3) *heavy (potato) load cooking* means the manufacturer's stated capacity of 12 by 20 by 2½ inch (300 by 500 by 65 mm) perforated hotel pans each filled with 8.0 ± 0.2 lb (3.6 ± 0.1 kg) of fresh, whole, US No. 1, size B, red potatoes.

(4) *idle energy rate* means the rate of appliance energy consumption while it is maintaining or holding at a stabilized operating condition or temperature.

(5) *product family* means the individual models offered within a product line based on the same engineering design, including number of pans. Performance results across the models represented in the qualified product line shall be equivalent.

(6) *included products*: means products that meet the definition of a Commercial Steam Cooker as specified herein are subject to the requirements of subdivision (b) of this section, with the exception of products listed in paragraph (7) of subdivision (a) of this section.

(7) *excluded products* means any product types not specifically defined in paragraph (6) of subdivision (a) of this section are exempted from the New York standards.

(b) Standard requirements for commercial steam cookers as is consistent with the efficiency levels established by ENERGY STAR V. 1.2 Specification for Commercial Steam Cookers, as incorporated by reference in Section 509.61.

(1) Cooking Energy Efficiency and Idle Energy Rate Requirements:

Table 16: Requirements for Electric Steam Cooker

Pan Capacity	Heavy Load Cooking Energy Efficiency	Idle Rate (watts)
3-pan	50%	400

4-pan	50%	530
5-pan	50%	670
6-pan and larger	50%	800

Table 17: Requirements for Gas Steam Cooker

Pan Capacity	Heavy Load Cooking Energy Efficiency	Idle Rate (Btu/h)
3-pan	38%	6,250
4-pan	38%	8,350
5-pan	38%	10,400
6-pan and larger	38%	12,500

(2) Significant Digits and Rounding:

(i) All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Calculated results shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

(ii) Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.

(c) Test procedures for assuring compliance with the standards established in Section 509.9(b).

(1) Representative models shall be selected for testing per the following requirements:

(i) For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For qualification of a product family, any model within that product family can be tested and serve as the representative model.

(2) When testing commercial steam cookers, the following test methods shall be used:

Table 18: Test Method for Steam Cookers

Test Methods	
Requirement	Test Method Reference
Cooking Energy Efficiency	ASTM Standard F1484-99, Test Method for the Performance of Steam Cookers, as incorporated by reference in Section 509.61
Idle Energy Rate	

Section 509.10 Computer Efficiency Standards

(a) The following definitions refer to computers:

(1) *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, (i) 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; (ii) the ability to support user input devices such as a keyboard, mouse, or touch pad; and (iii) 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

device with an integrated and primary display that has a screen size of twenty square inches or less, a server other than a small-scale server, or an industrial computer.

(2) *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.

(3) *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.

(4) *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:

(i) first discrete GPU with frame buffer bandwidth of 128 gigabytes per second or greater;

(ii) system memory of 16 gigabytes or more;

(iii) an external power supply with a nameplate output power of 150 watts or greater; and

(iv) total battery capacity of 75 watt-hours or greater.

(5) *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:

(i) has a mean time between failures (MTBF) of at least 13,000 hours;

(ii) has qualified or is currently being reviewed for qualification by two or more independent software vendor (ISV) product certifications;

(iii) 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.

(iv) supports the inclusion of three or more internal storage devices; and

(v) supports at least 32 gigabytes of system memory.

(6) *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:

(i) Product as shipped does not support altering frequency or voltage beyond the computer processing unit and GPU manufacturers' operating specifications.

(ii) 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.

(iii) 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.

(7) *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:

(i) 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.

(ii) Designed to operate continuously, except for maintenance.

(iii) Capable of operating in a simultaneous multi-user environment serving several users through networked client units.

(iv) 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).

(8) *high expandability computer* means a computer with any of the following:

(i) An expandability score of more than 690.

(ii) 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.

(iii) 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.

(9) *portable all-in-one* means a computer designed for limited portability that meets all of the following criteria:

(i) Includes an integrated display with a diagonal size greater than or equal to 17.4 inches.

(ii) Does not have a keyboard integrated into the physical housing of the product in its as-shipped configuration.

(iii) Includes and primarily relies on touch-screen input, with optional keyboard.

(iv) Includes the capacity to connect to a wireless network.

(v) Includes an internal battery that can power the computer's primary functions.

(10) *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, multi-screen notebooks, and notebook computer models with touch-sensitive screens. Notebook computer does not include mobile workstations or mobile gaming systems.

(11) *computer off mode* means an ACPI System Level S5 state.

(12) *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.

(13) *power factor* means the ratio of the real power to the apparent power.

(14) *main storage* means the largest capacity non-volatile storage device present in the system.

(15) *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.

(16) *discrete GPU* means a graphics processing unit (GPU) with a local memory controller interface and local graphics-specific memory.

(17) *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 21. It also does not include cards, such as riser cards, that split or physically extend a motherboard slot.

(18) *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).

(b) Standard requirements for computers.

(1) Computers that are within the scope and definition of the applicable regulation must meet the requirements in the California Code of Regulations, Title 20, section 1605.3(v), as incorporated by reference in Section 509.61. Computers shall comply with all of the following:

(i) 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 shall:

(*a*) Comply with Table 20 in paragraph (2) of this subdivision.

(*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 California Code of Regulations, Title 20 Section 1604(v)(4) within 30 minutes of user inactivity. If the transition is to a computer sleep mode, that sleep mode shall either:

(*i*) be a computer sleep mode as described in ACPI as S3; or

(*ii*) consume power less than or equal to the values shown in Table 19 in paragraph (2) of this subdivision.

(*2*) Transition connected displays into sleep mode within 15 minutes of user inactivity.

(2) EXCEPTION to California Code of Regulations, Title 20, 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 California Code of Regulations, Title 20, Section 1605.3(v)(5)(B), as incorporated by reference in Section 509.61.

Table 19: Alternative Computer Sleep Mode Power Limits

Computer Type	Maximum Power Consumption (watts)
Workstations, Mobile Workstations, High Expandability Computers, Small 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 20: Energy Consumption Requirements for Desktop Computers, Thin Clients, Notebook Computers, Mobile Gaming Systems, and Portable All-in-Ones

Computer Type	The measured annual energy consumption shall be less than or equal to the values below.
Desktop Computers, mobile gaming systems, and then clients with an ES of 250 or less	50 kWh/yr + applicable adders in Table 21
Desktop Computers, mobile gaming systems, and then clients with an ES more than 250 but no more than 425	60 kWh/yr + applicable adders in Table 21
Desktop Computers, mobile gaming systems, and then clients with an ES more than 425 but no more than 690	75 kWh/yr + applicable adders in Table 21
Notebook Computers and portable all-in-ones	30 kWh/yr + applicable adders in Table 21
Minimum power factor of a computer power supply that is not a federally-regulated external power supply	0.9 measured at full load

Table 21: 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 monitor 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 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 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	(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 support of 38.4% of CIELUV or greater (99% or more of defined Adobe RGB colors).
For a multi-screen notebook, this adder is applied for each integrated display that is enabled when shipped and shall	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	

show the same test image during testing.	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).*	
First discrete GPU that is not packaged on the same substrate as the CPU 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 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: 1) An adder is claimed for a device connected through this add-in-card; or 2) An interface score from Table 26 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 with a transmit rate of greater than 1 Gb/s and less than 10 Gb/s that is not an Add-in Card	4 per computer	0

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 measured in GBs. This adder does not apply to a computer that meets any of the following criteria: 1) Expandability score includes a credit for 4-channel memory. 2) System memory bandwidth Is less than 146 GB/s 3) Less than 4 GB of the system memory has a bandwidth of 146 GB/s or more and either: a) Has an integrated display with a resolution of 9 megapixels or less; or b) Does not have an integrated display. 4) Uses an adder for a first discrete GPU.	22.78*tanh[0.006*(S-70)+0.15]-12.33	9.11*tanh[0.006*(S-70)+0.15]-4.45

(3) Small volume manufacturers.

(i) Computers manufactured by a small volume manufacturer shall:

(*a*) Comply with the power management settings identified in California Code of Regulations, Title 20, Sections 1605.3(v)(5)(B)(2) and 1605.3(v)(6)(C), as incorporated by reference in Section 509.61.

(*b*) 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.

(*c*) Be exempt from all other requirements for computers unless the small volume manufacturer meets the criteria in California Code of Regulations, Title 20, Section 1605.3(v)(7)(C), as incorporated by reference in Section 509.61.

(ii) Small-scale servers and rack-mounted workstations are not required to comply with California Code of Regulations, Title 20, Section 1605.3(v)(7)(A)(2), as incorporated by reference in Section 509.61.

(iii) 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 California Code of Regulations, Title 20 Sections 1603, 1604(v)(5), 1605.3(v)(5) or 1605.3(v)(6), Section 1606, and Section 1607, as incorporated by reference in Section 509.61.

(4) Small-scale servers, high expandability computers, mobile workstations, and workstations. Small-scale servers, high expandability computers, mobile workstations, and workstations shall:

(i) Be powered by an internal power supply that meets or exceeds the standards in Table V-9 of *International Efficiency Marking Protocol for External Power Supplies Version 3.0* (Sept. 2013), 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).

(ii) Incorporate Energy-Efficient Ethernet functionality.

(iii) Transition connected displays into sleep mode within 15 minutes of user inactivity.

(iv) Transition the computer into either the computer sleep mode or computer off mode measured in accordance with California Code of Regulations, Title 20 Section 1604(v)(5), as incorporated by reference in Section 509.61, 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 19 in paragraph (2) of this subdivision.

EXCEPTION: to California Code of Regulations, Title 20 Section 1605.3(v)(6)(D): Small-scale servers and rack-mounted workstations are not required to comply with California Code of Regulations, Title 20 Section 1605.3(v)(6)(D), as incorporated by reference in Section 509.61.

Table 22: Requirements for Internal Power Supplies

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

(c) Test procedures for assuring compliance with the standards established in Section 509.10(b).

(1) The test method for computers is the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016), as incorporated by reference in Section 509.61, with the following modifications:

(i) Settings regarding hard-disk spinning shall not be altered from the default as-shipped settings.

(ii) 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), as incorporated by reference in Section 509.61.

(*a*) Computers shall use the "conventional" mode weighting of Table 23 in clause (*c*) of subparagraph (iii) of paragraph (1) of subdivision (c) of this section for a desktop computer, a mobile gaming system, a small-scale server, a high-expandability computer, or a thin client; or Table 24 in clause (*c*) of subparagraph (iii) of paragraph (1) of subdivision (c) of this section 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), as incorporated by reference in Section 509.61.

(*b*) In order to use the "full capability" mode weighting a computer shall have the following features enabled as shipped:

(*1*) Maintain Ethernet (IEEE 802.3-2015, IEEE 802.3-2018, or IEEE 802.3-2022) or wireless (IEEE 802.11-2012, IEEE 802.11-2016, or IEEE 802.11-2020) network addresses and network connection capability while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode.

(*2*) Resume from ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode upon request from outside the local network.

(*3*) Support advertising host services and network name while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode.

(*c*) In order to use the “remote wake” mode weighting a computer shall have the following features enabled as shipped:

(*1*) Maintain Ethernet (IEEE 802.3-2015, IEEE 802.3-2018, or IEEE 802.3-2022) or wireless (IEEE 802.11-2012, IEEE 802.11-2016, or IEEE 802.11-2020) network addresses and network connection capability while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode.

(*2*) Resume from ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode upon request from outside the local network.

(*d*) Workstations shall calculate total annual energy consumption using the weighting of Table 25 in clause (*c*) of subparagraph (iii) of paragraph (1) of subdivision (c) of this section, contained within Section 3 of the ENERGY STAR Program Requirements for Computers, Eligibility Criteria Version 6.1 (Rev. March-2016), as incorporated by reference in Section 509.61.

(iii) The expandability score calculation shall be included in test reports and shall be calculated as follows:

(*a*) Identify the score for each individual interface type as determined by Table 26 in clause (*c*) of subparagraph (iii) of paragraph (1) of subdivision (c) of this section 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.

(*b*) Each instance of an interface may only receive one score.

(*c*) Add 100 to the score.

Table 23: Mode Weightings for Desktop, Thin Clients, and Integrated Desktop Computers

Mode Weighting	Conventional	Full Network Connectivity			
		Base Capability	Remote Wake	Service Discovery/Name Services	Full Capability
T_{OFF}	45%	40%	30%	25%	20%
T_{SLEEP}	5%	15%	28%	36%	45%
T_{LONG_IDLE}	15%	12%	10%	8%	5%
T_{SHORT_IDLE}	35%	33%	32%	31%	30%

Table 24: Mode Weightings for Notebook Computers

Mode Weighting	Conventional	Full Network Connectivity			
		Base Capability	Remote Wake	Service Discovery/Name Services	Full Capability
T_{OFF}	25%	25%	25%	25%	25%
T_{SLEEP}	35%	39%	41%	43%	45%
T_{LONG_IDLE}	10%	8%	7%	6%	5%
T_{SHORT_IDLE}	30%	28%	27%	26%	25%

Table 25: Mode Weightings for Workstations

T_{OFF}	T_{SLEEP}	T_{LONG_IDLE}	T_{SHORT_IDLE}
35%	10%	15%	40%

Table 26: 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 26 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 x 16 (only count mechanical slots)	25
PCIe x 16 (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

(iv) 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:

(*a*) If hybrid graphics is available, choose the port that enables hybrid graphics.

(*b*) If a discrete GPU is installed, choose a connection to the first GPU, except for where it conflicts with clause (*a*) of subparagraph (iv) of paragraph (1) of subdivision (c) of this section .

(*c*) If no discrete GPU is installed, choose a connection to a port integrated into the motherboard.

(*d*) If there are multiple connector ports to choose from pursuant to clause (*a*) through clause (*c*) of subparagraph (iv) of paragraph (1) of subdivision (c) of this section , connect the display to a port using the first available from the port types listed below:

(*1*) Display Port

(*2*) HDMI

(*3*) DVI

(*4*) VGA

(*5*) Other

(v) An integrated desktop computer, mobile gaming system, or notebook computer shall be tested using the integrated display's native resolution.

(vi) 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.

(vii) For purposes of providing data as required in California Code of Regulations, Title 20, Section 1606, as incorporated by reference in Section 509.61, 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 California Code of Regulations, Title 20 Section 1605.3(v)(6), as incorporated by reference in Section 509.61. 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.

(viii) The computer sleep mode power measurement shall be tested in a modified manner from the test procedure described in IEC 62623:2012 or IEC 62623:2020, as incorporated by reference in Section 509.61. 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.

(ix) The power factor of a computer power supply and compliance with Table 22 in California Code of Regulations, Title 20, Section 1605.3(v)(6) 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.

(x) For multi-screen notebooks, configure each integrated display in the same way as the display of the units with one integrated display. The displays do not have to be configured sequentially (i.e., warmup times can be done simultaneously for all integrated displays).

(xi) For computers with cyclical behavior where operation without a battery pack when connected to the mains power source is not a supported configuration and where the normal measurement time would not capture one or more complete cycles, short-idle, long-idle, sleep, and off mode power measurements shall be tested in a modified manner from the test procedure described in IEC 62623:2012 or IEC 62623:2020, as incorporated by reference in Section 509.61:

(*a*) Short-idle mode testing: The short idle test duration shall be extended long enough to capture the energy consumption over one or more complete cycles. The unit shall be kept in short idle through minimal user input such as moving the mouse or pressing a key that does not perform any action (e.g., shift, ctrl, tab, etc).

(*b*) Long-idle mode testing: The long idle mode test duration shall be extended long enough to capture the energy consumption over one or more complete cycles. The unit under test shall remain in long idle during the entire time of the extended test by disabling the sleep mode.

(*c*) Sleep mode testing: The computer sleep mode power shall be tested after restarting the computer and ensuring that the sleep mode is enabled. 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. Sleep mode power measurement shall be taken over an extended period of time that is long enough to capture the energy consumption over one or more complete cycles.

(*d*) Off mode testing: The off-mode test duration shall be extended long enough to capture the energy consumption over one or more complete cycles.

Section 509.11 Computer Monitors Efficiency Standards

(a) The following definitions refer to computer monitors:

(1) *computer monitor* means an analog or digital device of diagonal screen size greater than or equal to seventeen inches and less than or equal to sixty-one inches, that has a pixel density of greater than five thousand 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, (i) displays with integrated or replaceable batteries designed to support primary operation without AC mains or external DC power (e.g., electronic readers, mobile phones, portable tablets, battery-powered digital picture frames); or (ii) a television or signage display.

(2) *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.

(3) *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.

(4) *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.

(5) *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.

(6) *enhanced-performance display (EPD)* means a computer monitor that has all of the following features and functionalities:

(i) a contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85o, with or without a screen cover glass;

(ii) a native resolution equal to or greater than 2.3 megapixels (MP); and

(iii) a color gamut size of at least sRGB as defined by IEC 61966-2 - 1:1999 , as incorporated by reference in Section 509.61. Shifts in color space are allowable as long as 99 percent or more of defined sRGB colors are supported.

(10) *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.

(11) *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.

(12) *luminance* means a measure of the brightness of a luminous surface.

(13) *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.

(14) *very high performance monitor* means a computer monitor that meets all of the following criteria:

(i) has a diagonal screen size of 27 inches or greater;

(ii) has a native resolution equal to or greater than either 3840x2160 pixels or 8.29 megapixels;

(iii) 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

(iv) has a contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85 degrees, with or without a screen cover glass.

(b) Standard requirements for computer monitors.

(1) Computer monitors that are within the scope and definition of the applicable regulation must meet the requirements in the California Code of Regulations, Title 20, section 1605.3(v), as incorporated by reference in Section 509.61.

(i) Computer monitors 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:

(*1*) Eon < (Eon_max + EEP + EGame + EOLED + ECurve), where:

(*2*) Eon is the computer monitor on-mode power draw in watts as determined under California Code of Regulations, Title 20, Section 1604(v)(3), as incorporated by reference in Section 509.61.

(*3*) Eon_max is the maximum on-mode power draw in watts as determined by Table 27 of clause (*d*) of subparagraph (i) of paragraph (1) of this subdivision.

(*4*) EEP is the enhanced performance display allowance in watts as determined in Table 28 of clause (*d*) of subparagraph (i) of paragraph (1) of this subdivision.

(*5*) EGame is the gaming monitor allowance in watts as determined in Table 28 of clause (*d*) of subparagraph (i) of paragraph (1) of this subdivision.

(*6*) EOLED is the OLED monitor allowance in watts as determined in Table 28 of clause (*d*) of subparagraph (i) of paragraph (1) of this subdivision.

(*7*) ECurve is the curved monitor allowance in watts as determined in Table 28 of clause (*d*) of subparagraph (i) of paragraph (1) of this subdivision..

(*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 2700 cd/m2 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 27: Power Consumption Requirements for Computer Monitors

Resolution in megapixels (MP)	Diagonal Screen Size (d) in Inches	Maximum Computer Monitor on Mode 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 + (0.01*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 28: List of Potentially Applicable Allowances

Allowance	Computer Monitor Type	Requirement
E_{EP}	Enhanced Performance Display with a color gamut support of 32.9% of CIELUV or greater (99% or more of defined sRGB colors)	.2 * Eon_max
	Enhanced Performance Display with a color gamut support of 38.4% of CIELUV or greater (99% or more of defined Adobe RGB colors)	.6 * Eon_max
E_{Game}	Gaming Monitors without incremental hardware-based assistance	.2 * Eon_max
	Gaming Monitors with incremental hardware-based assistance	.3 * Eon_max
E_{FRRG}	Fast refresh rate gaming monitory with MRR less than 480 Hertz	[0.0025*(MRR-300) + 0.25] * E_{on_max}
	Fast refresh rate gaming monitor with MRR of 480 Hertz or more	0.7 * E_{on_max}
E_{OLED}	OLED monitor	.2 * Eon_max
E_{Curve}	Curved Monitor	.2 * Eon_max

(2) EXCEPTIONS to California Code of Regulations, Title 20, Section 1605.3(v)(4), as incorporated by reference in Section 509.61: The following computer monitors are not required to comply with California Code of Regulations, Title 20 Section 1605.3(v)(4) but shall comply with the test procedures in California Code of Regulations, Title 20 Section 1604(v)(4), the certification requirements in California Code of Regulations, Title 20 Section 1606, and the marking requirements in California Code of Regulations, Title 20 Section 1607, as incorporated by reference in Section 509.61:

(i) KVMs.

(ii) KMMs.

(iii) Very high performance monitors.

(3) EXCEPTION to California Code of Regulations, Title 20 Section 1605.3(v)(4), as incorporated by reference in Section 509.61: Medical computer monitors are not required to comply with these requirements or the test but shall comply with the certification and the marking requirements.

(c) Test procedures for assuring compliance with the standards established in Section 509.11(b).

(i) The test method for computer monitors is the ENERGY STAR Program Requirements for Displays, Final Test Method (September 2015), as incorporated by reference in Section 509.61, with the following modifications:

(*a*) On mode measurements shall be made using the IEC 62087 -7 Ed. 1.0 2018, as incorporated by reference in Section 509.61, and computer monitor sleep mode and computer monitor off mode measurements shall be made using the IEC 62301 Ed. 2.0, as specified in the ENERGY STAR

Program Requirements for Displays, Final Test Method (September 2015) , as incorporated by reference in Section 509.61.

(*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.

Section 509.12 Electric Vehicle Supply Equipment Efficiency Standards

(a) The following definitions refer to electric vehicle supply equipment:

(1) *electric vehicle supply equipment (EVSE)* means equipment that supplies electricity in an appropriate form to storage devices (including batteries and super capacitors) that are part of electric vehicles. EVSE includes equipment that performs this function and equipment that is embedded in electric vehicles.

(i) *level 1*: A galvanically-connected EVSE with a single-phase input voltage nominally 120 volts AC and maximum output current less than or equal to 16 amperes AC.

(ii) *level 2*: A galvanically-connected EVSE with a single-phase input voltage range from 208 to 240 volts AC and maximum output current less than or equal to 80 amperes AC.

(iii) *fast DC*: A galvanically-connected EVSE that includes an off-board charger and provides DC current greater than or equal to 80 amperes DC.

(iv) *wireless / inductive*: A non-galvanically-connected EVSE.

(2) EVSE functions:

(i) *primary function*: Providing current to a connected load.

(ii) *secondary function*: Function that enables, supplements, or enhances a primary function. For EVSE, examples of Secondary Functions are:

(*a*) *automatic brightness control (ABC)*: The self-acting mechanism that controls the brightness of a display or lamp as a function of ambient light;

(*b*) *full network connectivity*: The ability of the EVSE to maintain network presence while in Partial On Mode;

Note: Presence of the EVSE's network services, its applications, and possibly its display is maintained even if some components of the EVSE are powered down. The EVSE can elect to change power states based on receipt of network data from remote network devices, but should otherwise stay in a low power mode absent a demand for services from a remote network device.

(*c*) *occupancy sensing*: detection of human or object presence in front of or in the area surrounding an EVSE;

(*d*) communicating with the vehicle;

(*e*) illumination of display, indicator lights, or ambient lighting;

(*f*) public access control (rfid card, authorization, etc.);

(*g*) control pilot signal; and

(*h*) wake-up function.

(ii) *tertiary function*: Function other than a primary or a secondary function.

Example: An EMC filter and status indication provides their function in No Vehicle Mode, Partial On Mode, and On Mode

(3) EVSE operational modes and power states:

Note: The transition period to a different mode; whether automatically initiated, or via user action; does not constitute a mode.

(i) *disconnected*: Condition of the equipment during which all connections to power sources supplying the equipment are removed or galvanically isolated and no functions depending on those power sources are provided. The term power source includes power sources external and internal to the equipment.

(ii) *no vehicle mode*: Condition during which the equipment is connected to external power and the product is physically disconnected from vehicle (mode can only be entered or exited through manual intervention). No Vehicle Mode is intended to be the lowest-power mode of the EVSE.

Note: The vehicle-EVSE interface is in State A of SAE J1772 at IEC 62196-1:2022, as incorporated by reference in Section 509.61, where the vehicle is not connected.

(iii) *on mode*: Condition during which the equipment provides the primary function or can promptly provide the primary function.

(*a*) *operation mode*: Condition during which the equipment is performing the primary function.

Note: The vehicle-EVSE interface is in State C, where the vehicle is connected and accepting energy

(*b*) *idle mode*: Condition during which the equipment can promptly provide the primary function but is not doing so.

Note: idle mode is the condition within On Mode where the EVSE is connected to the vehicle or vehicle simulator but is not actively providing current. The vehicle-EVSE interface is in State C, where the vehicle is connected and ready to accept energy.

(*c*) *partial on mode*: Condition during which the equipment provides at least one secondary function but no primary function.

Note: The vehicle-EVSE interface is in State B1 or B2, where the vehicle is connected but not ready to accept energy and the EVSE is or is not ready to supply energy.

Operational Modes	Most closely related Interface	Further Description

	State as Defined in SAE J1772	
No Vehicle Mode	State A	No Vehicle Mode is associated with State A, or where the EVSE is not connected to the EV. The EVSE is connected to external power.
Partial On Mode	State B1 or State B2	Partial On Mode is associated with State B1 or State B2 where the vehicle is connected but is not ready to accept energy. Sub-state B1 is where the EVSE is not ready to supply energy and substate B2 is where the EVSE is ready to supply energy.
On Mode		
Idle Mode	State C	Idle Mode is associated with State C, where the vehicle is connected and ready to accept energy and the EVSE is capable of promptly providing current to the EV but is not doing so.
Operation Mode	State C	Operation Mode is associated with State C, where the EVSE is providing the primary function, or providing current to a connected load (i.e., the relay is closed and the vehicle is drawing current).

(*d*) *power management*: Automatic control mechanism that achieves the lowest power consistent with a pre-determined level of functionality.

(4) Other:

(i) *apparent power (S)*: The product of RMS voltage and RMS current, which is equal to magnitude of the complex power, and measured in volt-amperes (VA).

(ii) *average power (P) (also real power)*: The power in a circuit which is transformed from electric to non-electric energy and is measured in watts (W). For a two-terminal device with instantaneous current and voltage waveforms i(t) and v(t) which are periodic with period T, the real or average power P is:

(iii) *duty cycle*: The ratio or a given time interval of the uninterrupted duration at the high logic state to the total time.

Note: This duty cycle, lying between 0 and 1, may be expressed as a percentage

(iv) *power factor* (PF): The ratio of the average power (P) in watts to the apparent power (S) in voltamperes.

(v) *unit under test (UUT):* The specific sample of a representative model undergoing measurement which includes the base product and any accessories packaged with it.

(vi) *illuminance*: The luminous flux per unit area of light illuminating a given surface, expressed in units of lux (lx).

(vii) *luminance*: The photometric measure of the luminous intensity per unit area of light travelling in a given direction, expressed in candelas per square meter (cd/m2).

(viii) *high resolution display*: A screen device that converts a video signal into a visual output and is capable of displaying a minimum of 480x234 native resolution and has a backlight (e.g., LCD panel, OLED panel).

(5) *product family:* A group of product models that are made by the same manufacturer, subject to the same ENERGY STAR certification criteria, and of a common basic design. Product models within a family differ from each other according to one or more characteristics or features that either have no impact on product performance with regard to ENERGY STAR certification criteria, or are specified herein as acceptable variations within a Product Family. For EVSE, acceptable variations within a Product Family include:

(i) color;

(ii) output cable; and

(iii) housing.

(6) *connected functionality* definitions:

(i) *communication link*: The mechanism for bi-directional data transfers between the EVSE and one or more external applications, devices or systems.

(ii) *demand response (DR)*: Changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

(iii) *demand response management system (DRMS)*: The system operated by a program administrator, such as the utility or third party, which dispatches signals with DR instructions and/or price signals to the ENERGY STAR EVSE and receives messages from the EVSE. Medium voltage AC input supply EVSE (13.2 kV).

(iv) *EVSE system*: As shown in Figure 2 of this subparagraph, it includes the ENERGY STAR certified EVSE, integrated or separate communications hardware, and additional hardware and software required to enable connected functionality.

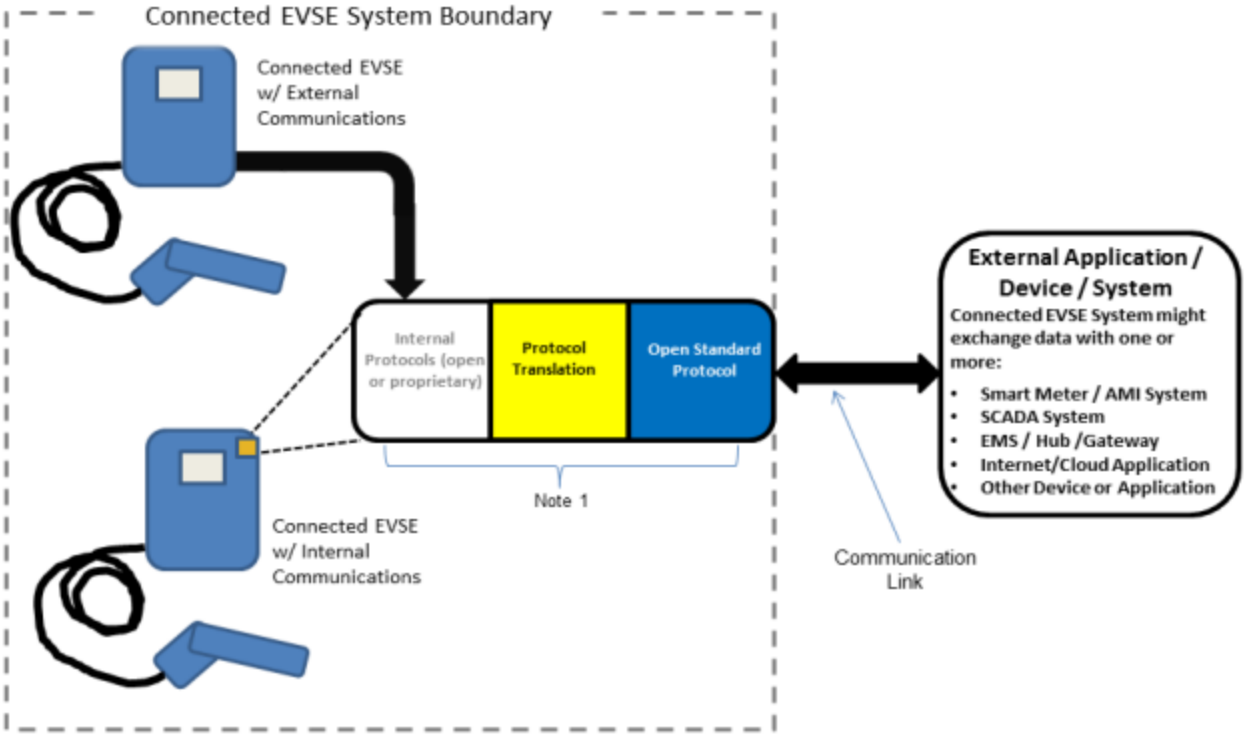


Figure 2: Connected EVSE System

(v) *load management entity*: DRMS, home energy management system, etc.

(7) *open standards are*:

(i) included in the Smart Grid Interoperability Panel (SGIP) Catalog of Standards, and/or

(ii) included in the National Institute of Standards and Technology (NIST) Smart Grid framework Tables 4.1 and 4.2, and/or

(iii) adopted by the American National Standards Institute (ANSI) or another well-established international standards organization such as the International Organization for Standardization (ISO),

International Electrotechnical Commission (IEC), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE), or Internet Engineering Task Force (IETF).

(b) Standard requirements for electric vehicle supply equipment, as is consistent with ENERGY STAR Specification for Electric Vehicle Supply Equipment April 2017 V1.0, as incorporated by reference in Section 509.61.

(1) Significant Digits and Rounding

(i) All calculations shall be carried out with actual measured (unrounded) values. Only the final result of a calculation shall be rounded.

(ii) Unless otherwise specified within this specification, compliance with specification limits shall be evaluated using exact values without any benefit from rounding.

(iii) Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit

(2) General Requirements

(i) Each EVSE submitted for ENERGY STAR certification shall be Listed by a Nationally Recognized Testing Laboratory (NRTL) for safety.

(ii) Dual Input Level 1 and Level 2 EVSE shall meet all requirements and report information in both configurations.

(3) No Vehicle Mode Requirements

Note: These requirements refer to the SAE J1772 State A.

(i) Measured No Vehicle Mode power (PNO_VEHICLE) shall be less than or equal to the Maximum No Vehicle Mode Power Requirement (PNO_VEHICLE_MAX), as calculated per subparagraph (ii) of paragraph (3) of subdivision (b) of this section, subject to the following requirements.

(*a*) For products with ABC enabled by default, the average No Vehicle Mode power in high and low illuminance conditions shall be used in place of PNO_VEHICLE, above.

(*b*) For products capable of network connection with multiple protocols (e.g., Wi-Fi and Cellular), only the allowance for the protocol enabled during testing shall be claimed.

(ii) Equation: Calculation of Maximum No Vehicle Mode Power Requirement

$$P_{NO\_VEHICLE\_MAX} = 2.6 + P_{WAKE} + P_{DISPLAY}$$

Where:

(*a*) $P_{NO\_VEHICLE\_MAX}$ is the Maximum No Vehicle Mode Power Requirement;

(*b*) P_{WAKE} is the No Vehicle Mode power allowance for the network connection with wake capability enabled during testing listed in Table 30 of clause (*c*) of subparagraph (ii) of paragraph (3) of subdivision (b) of this section; and

(*c*) $P_{DISPLAY}$ is the No Vehicle Mode power allowance for a High-Resolution Display enabled during testing listed in Table 30 of clause (*c*) of subparagraph (ii) of paragraph (3) of subdivision (b) of this section.

Table 30: No Vehicle Mode Power Allowances

Product Function	No Vehicle Mode Power Allowance (watts, rounded to the nearest 0.1 W for reporting)
In-use Wi-Fi or Ethernet Interface with Wake Capability (P_{WAKE})	$1.0/n,$ Where: n is the number of outputs.
In-use Cellular with Wake Capability (P_{WAKE})	$2.0/n,$ Where: n is the number of outputs.
Other In-use LAN (Local Area Network) Interface with Wake Capability (P_{WAKE})	$1.0/n,$ Where: n is the number of outputs.
In-use High Resolution Display ($P_{DISPLAY}$)	$[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]/(n)$ Where: • A is the Screen Area in square inches; • ℓ is the Maximum Measured Luminance of the Display in candelas per square meter, as measured in Section 4) C) of the ENERGY STAR Test Method for Determining Electric Vehicle Supply Equipment Energy; • tanh is the hyperbolic tangent function; and • n is the number of outputs. **Example**: For a single-output EVSE with a maximum measured luminance of 300 candelas/m^2 and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.

(4) Partial On Mode Requirements

Note: These requirements refer to the SAE J1772 State B1 or State B2.

(i) Measured Partial On Mode power (PPARTIAL_ON) for Level 1 and Level 2 EVSE shall be less than or equal to the Maximum Partial On Mode Power Requirement (PPARTIAL_ON_MAX), as calculated per Equation 2 of clause (*c*) of subparagraph (i) of paragraph (4) of subdivision (b) of this section , subject to the following requirements.

(*a*) For products with ABC enabled by default, the average Partial On Mode power in high and low illuminance conditions shall be used in place of PPARTIAL_ON, above.

(*b*) For products capable of network connection with multiple protocols (e.g., Wi-Fi and Cellular), only the allowance for the protocol enabled during testing shall be claimed.

(*c*) Equation: Calculation of Maximum Partial On Mode Power Requirement

$$P_{PARTIAL\_ON\_MAX} = 2.6 + P_{WAKE} + P_{DISPLAY}$$

Where:

(*1*) $P_{PARTIAL\_ON\_MAX}$ is the Maximum Partial On Mode Power Requirement;

(*2*) P_{WAKE} is the Partial On Mode power allowance for the network connection with wake capability enabled during testing listed in Table 31 of subclause (*3*) of clause (*c*) of subparagraph (i) of paragraph (4) of subdivision (b) of this section; and

(*3*) $P_{DISPLAY}$ is the Partial On Mode power allowance for a High-Resolution Display enabled during testing listed in Table 31 of subclause (*3*) of clause (*c*) of subparagraph (i) of paragraph (4) of subdivision (b) of this section.

Table 31: Partial On Mode Power Allowances

Product Function	Partial On Mode Power Allowance (watts, rounded to the nearest 0.1 W for reporting)
In-use Wi-Fi or Ethernet Interface with Wake Capability (P_{WAKE})	$1.0/n,$ Where: n is the number of outputs.
In-use Cellular with Wake Capability (P_{WAKE})	$2.0/n,$ Where: n is the number of outputs.
Other In-use LAN (Local Area Network) Interface with Wake Capability (P_{WAKE})	$1.0/n,$ Where: n is the number of outputs.
In-use High Resolution Display ($P_{DISPLAY}$)	$[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]/(n)$ Where: • A is the Screen Area in square inches; • ℓ is the Maximum Measured Luminance of the Display in candelas per square meter, as measured in Section 4) C) of the ENERGY STAR Test Method for Determining Electric Vehicle Supply Equipment Energy; • tanh is the hyperbolic tangent function; and • n is the number of outputs. Example: For a single-output EVSE with a maximum measured luminance of 300 candelas/m^2 and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.

(5) Idle Mode Requirements

Note: These requirements refer to the SAE J1772 State C.

(i) Measured Idle Mode power (PIDLE), shall be less than or equal to the Maximum Idle Mode Power Requirement (PIDLE_MAX), as calculated per clause (*c*) of subparagraph (i) of paragraph (5) of subdivision (b) of this section, subject to the following requirements.

(*a*) For products with ABC enabled by default, the average Idle Mode power in high and low illuminance conditions shall be used in place of PIDLE, above.

(*b*) For products capable of network connection with multiple protocols (e.g., Wi-Fi and Cellular), only the allowance for the protocol enabled during testing shall be claimed.

(*c*) Equation: Calculation of Maximum Idle Mode Power Requirement

$P_{IDLE\ \_MAX} = (0.4 \times \text{Max Current}) + 2.6 + P_{WAKE} + P_{DISPLAY}$

Where:

(*1*) $P_{IDLE\ \_MAX}$ is the Maximum Idle Mode Power Requirement, in watts.

(*2*) Max Current is the Nameplate Maximum Output Current, in amperes.

(*3*) P_{WAKE} is the Idle Mode power allowance for the network connection with wake capability enabled during testing listed in Table 32 of subclause (*4*) of clause (*c*) of subparagraph (i) of paragraph (5) of subdivision (b) of this section.

(*4*) $P_{DISPLAY}$ is the Idle Mode power allowance for a High-Resolution Display enabled during testing listed in Table 32 of subclause (*4*) of clause (*c*) of subparagraph (i) of paragraph (5) of subdivision (b) of this section.

Table 32: Idle Mode Power Allowance

Product Function	Idle Mode Power Allowance (watts, rounded to the nearest 0.1 W for reporting)
In-use Wi-Fi or Ethernet Interface with Wake Capability (P_{WAKE})	$\frac{1.0}{n}$, Where: n is the number of outputs.
In-use Cellular with Wake Capability (P_{WAKE})	$\frac{2.0}{n}$, Where: n is the number of outputs.
Other In-use LAN (Local Area Network) Interface with Wake Capability (P_{WAKE})	$\frac{1.0}{n}$, Where: n is the number of outputs.
In-use High Resolution Display ($P_{DISPLAY}$)	$\frac{[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]}{n}$ Where: • A is the Screen Area in square inches; • ℓ is the Maximum Measured Luminance of the Display in candelas per square meter, as measured in Section 4) C) of the ENERGY STAR Test Method for Determining Electric Vehicle Supply Equipment Energy, as incorporated by reference in Section 509.61; • tanh is the hyperbolic tangent function; and • n is the number of outputs.

	Example: For a single-output EVSE with a maximum measured luminance of 300 candelas/m^2 and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.

(6) Connected Functionality. This section includes connected criteria for ENERGY STAR certified EVSE. EVSE that meet the connected functionality criteria shall be capable of supporting Demand Response (DR) (e.g., via software updates or integration with an external service). Compliance with this section is optional. ENERGY STAR certified EVSE that comply with all connected criteria will be identified on the ENERGY STAR website as having 'Connected' functionality.

Note: EPA recommends that, once DR capability is added, the EVSE be capable of directly or indirectly supporting both signals-based DR, as well as price response. As appropriate, EPA further encourages connected functionality that enables direct control by the Load Management Authority as well as integration with commercial EVSE management applications and/or energy management systems. Brand owners are encouraged to engage with utilities to ensure DR capabilities align with utility needs and DR program designs.

Brand owners are encouraged to engage with utilities to ensure DR capabilities align with utility needs and DR program designs.

(i) Grid Communications: The product shall include a communication link that is capable of supporting DR. This link shall use open standards, as defined in this specification, for all communication layers.

(ii) Products that include a communication link that uses Open Charge Point Protocol (OCPP) also comply with this criterion.

Note: Effective November 24, 2015 OCPP is being developed by OASIS as the Standard Development Organization with a goal of integrating OCPP with the International Electrotechnical Commission (IEC) framework. EPA is proposing to include OCPP since it is widely used and is in the process of being established as an open standard.

(iii) Open Access: To enable interconnection with the product over the communication link, an interface specification, application programming interface (API) or similar documentation that is intended to enable DR functionality shall be made readily available.

Note: Products that enable direct, on-premises, open-standards based interconnection are preferred, but alternative approaches, where open-standards connectivity is enabled only with use of off-premise services, are also acceptable.

(iv) Consumer Override: The product shall be capable of supporting DR event override-ability by consumers.

(v) Capabilities Summary: A ≤4000 character (approximately 500 words or less) summary description of the EVSE system's and/or associated Service Provider's DR capabilities/services shall be submitted.

(*a*) In this summary, the following shall be included:

(*1*) DR Support, e.g., implemented, planned for CY2017.

(*2*) For products that do not ship with DR capabilities enabled, the steps needed to enable these capabilities.

(*b*) In this summary, EPA recommends noting the following, as applicable:

(*1*) DR services that the product has the capability to participate in such as load dispatch, ancillary services (including V2G), price notification and price response.

(*2*) Whether the EVSE can be directly addressed via the interface specification, API or similar documentation.

(*3*) Support for locational DR, e.g., to ZIP code(s), feeder(s), or to EVSE endpoints specified by the Load Management Entity.

(*4*) List open communications supported by the EVSE, including applicable certifications.

(*5*) Feedback to Load Management Entity, e.g., verification/M&V, override notification.

(*6*) Response configurability/flexibility by the consumer and/or Load Management Entity.

(*7*) Measures to limit consumer impacts, if any.

(c) Test procedures for assuring compliance with the standards established in Section 509.12(b).

Table 33: Test Method for EVSEs

Product Type	Test Method

All Electric Vehicle Supply Equipment	ENERGY STAR Electric Vehicle Supply Equipment Test Method (Rev. Apr-2017), as incorporated by reference in Section 509.61
Electric Vehicle Supply Equipment with Display	ENERGY STAR Displays Test Method (Rev. Sep-2015), as incorporated by reference in Section 509.61
Electric Vehicle Supply Equipment with Full Network Connectivity	Section 6.7.5.2 of Consumer Electronics Association (CEA) 2037 A, Determination of Television Set Power Consumption, as incorporated by reference in Section 509.61

Section 509.13 Faucets Efficiency Standards

(a) The following definitions refer to faucets:

(1) *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.

(2) *faucet* means a lavatory faucet, kitchen faucet, metering faucet, or replacement aerator for a lavatory or kitchen faucet.

(3) *flow rate* means the rate of water flow of a plumbing fitting, as determined using the applicable test method.

(4) *kitchen faucet* means a faucet designed for discharge into a kitchen sink.

(5) *kitchen replacement aerator* means an aerator sold as a replacement, separate from the kitchen faucet to which it is intended to be attached.

(6) *lavatory* means a basin or bowl designed for washing the face and hands.

(7) *lavatory faucet* means a plumbing fitting designed for discharge into a lavatory.

(8) *lavatory replacement aerator* means an aerator sold as a replacement, separate from the lavatory faucet to which it is intended to be attached.

(9) *metering faucet* means a faucet that, when turned on, will gradually shut itself off over a period of several seconds.

(10) *ozf* means ounce force.

(11) *public lavatory faucet* means a fitting intended to be installed in non-residential bathrooms that are exposed to walk-in traffic.

(12) *wash fountain* means a lavatory faucet designed for simultaneous use by two or more persons.

(13) *water use* means the quantity of water flowing through a showerhead or faucet, at point of use, determined using the test method.

(b) Standard requirements for faucets.

(1) The flow rate of private lavatory faucets and lavatory replacement aerators shall be not greater than 1.2 gpm at 60 psi.

(i) 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.

(ii) 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)).

(2) The flow rate of kitchen faucets, kitchen replacement aerators, public lavatory faucets, and public lavatory replacement aerators shall be not greater than the applicable values shown in Table 34.

Table 34: Standards for Kitchen Faucets and Aerators and Public Lavatory Faucets and Aerators

Appliance	Maximum Flow Rate
Kitchen faucets and aerators	1.8 gpm at 60 psi; kitchen faucets are permitted to temporarily increase the flow above the maximum rate, but not to exceed 2.2 gpm at 60 psi and must revert to a maximum flow rate of 1.8 gpm at 60 psi upon valve closure.
Public lavatory faucets and aerators	0.5 gpm at 60 psi

(c) Test procedures for assuring compliance with the standards established in Section 509.13(b). The test method for faucets is 10 CFR section 430.23(s) (Appendix S to Subpart B of part 430) , as incorporated by reference in Section 509.61.

Section 509.14 Federally Exempt Linear Fluorescent Lamps Efficiency Standards

(a) The following definitions refer to federally exempt linear fluorescent lamps:

(1) *federally exempt fluorescent lamp* means linear lamps excluded from the definition of general service fluorescent lamps in 10 CFR section 430.32(n), as incorporated by reference in Section 509.61. Federally exempt fluorescent lamps include high CRI linear fluorescent lamps, impact resistant linear lamps, cold temperature linear lamps and less than 4-foot linear fluorescent lamps.

(2) *cold temperature fluorescent lamp* means a fluorescent lamp that is not a compact fluorescent lamp that:

(i) is specifically designed to start at -20°F when used with a ballast conforming to the requirements of ANSI C78.81 and ANSI C78.901, as incorporated by reference in Section 509.61; and

(ii) is expressly designated as a cold temperature lamp both in markings on the lamp and in marketing materials, including catalogs, sales literature, and promotional material.

(3) *high color rendering index (cri) fluorescent lamp* means a fluorescent lamp with a color rendering index of 87 or greater that is not a compact fluorescent lamp.

(4) *impact-resistant fluorescent lamp* means a fluorescent lamp that is not a compact fluorescent lamp that:

(i) has a coating or equivalent technology that is compliant with NSF/ANSI 51 and is designed to contain the glass if the glass envelope of the lamp is broken; and

(ii) is designated and marketed for the intended application, with:

(*a*) the designation on the lamp packaging; and

(*b*) marketing materials that identify the lamp as being impact-resistant, shatter-resistant, shatterproof, or shatter-protected.

(b) Standard requirements for federally exempt linear fluorescent lamps.

(1) High CRI, cold temperature, and impact-resistant fluorescent lamps shall meet the minimum efficacy requirements contained in 10 CFR section 430.32(n)(4), as incorporated by reference in Section 509.61.

(2) Each of the following general service fluorescent lamps manufactured on or after January 26, 2018, shall meet or exceed the following lamp efficacy standards shown in the table:

Table 35: Requirements for General Service Fluorescent Lamps

Lamp Type	Correlated color temperature	Min. Average lamp efficacy (lm/W)
4-foot medium bipin	≤4,500K	92.4
	>4,500k and ≤7,000K	88.7
2-foot U-shaped	≤4,500K	85.0
	>4,500k and ≤7,000K	83.3
8-foot slimline	≤4,500K	97.0
	>4,500k and ≤7,000K	93.0
8-foot high output	≤4,500K	92.0
	>4,500k and ≤7,000K	88.0
4-foot miniature bipin standard output	≤4,500K	95.0
	>4,500k and ≤7,000K	89.3
4-foot miniature bipin high output	≤4,500K	82.7
	>4,500k and ≤7,000K	76.9

(c) Test procedures for assuring compliance with the standards established in Section 509.14(b).

(1) The measurement procedure shall be as described in IES LM-9, except that lamps shall be operated at the appropriate voltage and current conditions as described in ANSI C78.375, and in ANSI C78.81, as incorporated by reference in Section 509.61, or ANSI C78.901, as incorporated by reference in Section 509.61, and lamps shall be operated using the appropriate reference ballast at input voltage specified by the reference circuit as described in ANSI C82.3. If, for a lamp, both low-frequency and

high-frequency reference ballast settings are included in ANSI C78.81, as incorporated by reference in Section 509.61 or ANSI C78.901, as incorporated by reference in Section 509.61, the lamp shall be operated using the low-frequency reference ballast.

(2) For lamps not listed in ANSI C78.81 nor in ANSI C78.901, the lamp shall be operated using the following reference ballast settings:

(i) 4-Foot medium bi-pin lamps shall be operated using the following reference ballast settings: T10 or T12 lamps are to use 236 volts, 0.43 amps, and 439 ohms; T8 lamps are to use 300 volts, 0.265 amps, and 910 ohms.

(ii) 2-Foot U-shaped lamps shall be operated using the following reference ballast settings: T12 lamps are to use 236 volts, 0.430 amps, and 439 ohms; T8 lamps are to use 300 volts, 0.265 amps, and 910 ohms.

(iii) 8-foot slimline lamps shall be operated using the following reference ballast settings:

(*a*) T12 lamps: 625 volts, 0.425 amps, and 1280 ohms.

(*b*) T8 lamps: 625 volts, 0.260 amps, and 1960 ohms.

(iv) 8-foot high output lamps shall be operated using the following reference ballast settings:

(*a*) T12 lamps: 400 volts, 0.800 amps, and 415 ohms.

(*b*) T8 lamps: 450 volts, 0.395 amps, and 595 ohms.

(v) 4-foot miniature bipin standard output or high output lamps shall be operated using the following reference ballast settings:

(*a*) Standard Output: 329 volts, 0.170 amps, and 950 ohms.

(*b*) High Output: 235 volts, 0.460 amps, and 255 ohms.

(3) Lamp lumen output (lumens) and lamp electrical power input (watts), at the reference condition, shall be measured and recorded. Lamp efficacy shall be determined by computing the ratio of the measured lamp lumen output and lamp electrical power input at equilibrium for the reference condition.

Section 509.15 Gas Fireplaces Efficiency Standards

(a) The following definitions refer to gas fireplaces:

(1) *gas fireplace* means a decorative gas fireplace or a heating gas fireplace.

(2) *decorative gas fireplace* means a vented fireplace, including appliances that are freestanding, recessed, zero clearance, or a gas fireplace insert, that is fueled by natural gas or propane, is marked for decorative use only, and is not equipped with a thermostat or intended for use as a heater.

(3) *heating gas fireplace* means a vented fireplace, including appliances that are freestanding, recessed, zero clearance, or a gas fireplace insert, that is fueled by natural gas or propane and is not a decorative fireplace.

(b) Standard requirements for gas fireplaces.

(1) Gas fireplaces shall comply with the following requirements:

(i) gas fireplaces shall be capable of automatically extinguishing any pilot flame when the main gas burner flame is extinguished;

(ii) gas fireplaces must prevent any ignition source for the main gas burner flame from operating continuously for more than seven days; and

(iii) decorative gas fireplaces must have a direct vent configuration, unless marked for replacement use only.

Section 509.16 Lawn Spray Sprinklers Efficiency Standards

(a) The following definitions refer to lawn spray sprinklers:

(1) *pressure regulator* means a device that maintains constant operating pressure immediately downstream from the device, given higher pressure upstream.

(2) *integral pressure regulator* means a device located within a spray sprinkler body that maintains constant operating pressure immediately downstream from the device, given a higher upstream pressure.

(3) *landscape* means any areas that are planted or installed and designed to receive irrigation, including turf grass, ground covers, shrubs, trees, flowers, and similar plant materials. Landscape does not include agricultural crops grown and harvested for monetary return.

(4) *maximum operating pressure of a spray sprinkler body* means the highest manufacturer-recommended inlet pressure to ensure proper operation.

(5) *nozzle of a spray sprinkler* means the discharge opening or orifice of a spray sprinkler used to control the volume of discharge, distribution pattern, and droplet size.

(6) *orifice of a spray sprinkler* means the emission point from a nozzle into the atmosphere.

(7) *regulation pressure of a spray sprinkler body* means its rated outlet pressure, regardless of higher inlet pressure, as stated by the manufacturer.

(8) *spray sprinkler of a spray sprinkler body* means its rated outlet pressure, regardless of higher inlet pressure, as stated by the manufacturer.

(i) consists of a spray sprinkler body and a nozzle or orifice, and

(ii) discharges water through the air at a minimum flow rate of 0.5 gallons per minute when operated at an inlet pressure of 30 pounds per square inch or more, with the largest area of coverage available for the nozzle series using a full circle pattern.

(9) *spray sprinkler body* means a sprinkler body that does not contain components to drive the rotation the nozzle or orifice during operation and lacks an integral control valve. This term includes a spray sprinkler body that is a component of a spray sprinkler.

(10) *sprinkler body* means the exterior case or shell of a sprinkler incorporating a means of connection to the piping system, designed to convey water to a nozzle or orifice.

(b) Standard requirements for lawn spray sprinklers.

(1) The spray sprinkler body shall meet all criteria in Section 302 of ASABE/ICC 802-2014, Sprinkler and Bubbler Design Requirements, as incorporated by reference in Section 509.61.

(i) Rated temperature: Sprinklers and bubblers shall be designed to withstand ambient air temperatures from –40° Fahrenheit (F) to 140° F (-40° to 60° C) without permanent distortion or degradation of performance. Sprinklers and bubblers shall be operable at ambient air and water

temperatures from 40° to 140° F (5° to 60° C) and dynamic water temperatures from 40° to 85° F (5° to 36° C) over the operating pressure range specified by the manufacturer.

(ii) Inlet connections: All inlet connections shall comply with the performance requirements of this standard. Where NPT pipe threads are used for inlet connections on sprinklers or bubblers, they shall be capable of mating with connections that comply with ASME B1.20.1 or ASTM F1498, as incorporated by reference in Section 509.61. All inlet connections shall comply with the performance requirements of this standard. All inlet connections shall be designed to withstand the full range of operating pressures without permanent distortion or leakage.

(iii) Filters and strainers: Where installed, filters and strainers shall consist of a cleanable or replaceable element or elements that can be accessed without removing the body from the system.

(iv) Servicing: Sprinklers or bubblers designed to allow the replacement of wearing or interchangeable parts shall be designed so that servicing can be accomplished without removing the body from the system.

(v) Adjustments: Sprinklers or bubblers designed to allow the adjustment of any performance parameter shall be designed so that the adjustment can be accomplished while the device is installed.

(vi) Burst pressure: Sprinklers and bubblers shall withstand a hydrostatic test pressure of 1.5 times the maximum published operating pressure, but not less than 150 psi (1034 kPa), when tested in accordance with Section 303.5.1 of ASABE/ICC 802-2014, as incorporated by reference in section 509.61, without permanent distortion or leakage.

(vii) Check valve function: Sprinklers that are designed to have an integral means of preventing flow discharge through the emission device during periods of nonoperation shall be capable of preventing flow where the elevation change is equal to or less than 7 feet (3.0 psi).

(viii) Pressure regulation: Sprinklers intended for use with spray nozzles shall incorporate integral pressure regulation to deliver optimum spray nozzle performance as stated by the manufacturer.

(2) The spray sprinkler body shall meet the following performance requirements when tested in accordance with the test method in the WaterSense Specification for Spray Sprinkler Bodies Version 1.0, Appendix B, as incorporated by reference in Section 509.61.

(i) Maximum flow rate at any tested pressure level—The percent difference between the initial calibration flow rate (as described in Appendix B) and the maximum flow rate at any tested pressure level, averaged for the selected samples at the test pressure levels where the maximum flow rate occurred, shall not exceed +/- 12.0 percent.

(ii) Maximum flow rate at any tested pressure level—The percent difference between the initial calibration flow rate (as described in Appendix B) and the maximum flow rate at any tested pressure level, averaged for the selected samples at the test pressure levels where the maximum flow rate occurred, shall not exceed +/- 12.0 percent.

(iii) Minimum outlet pressure—The average outlet pressure at the initial calibration point (as described in Appendix B) of the selected samples shall not be less than two-thirds (67 percent) of the regulation pressure.

(c) Test procedures for assuring compliance with the standards established in Section 509.16(b).

(1) The sprinkler body's ability to provide pressure regulation and maintain consistent flow shall be tested in accordance with the methodology included in the WaterSense Specification for Spray Sprinkler Bodies Version 1.0, Appendix B , as incorporated by reference in Section 509.61.

Section 509.17 Portable Electric Spas Efficiency Standards

(a) The following definitions refer to portable electric spas:

(1) *portable electric spa* means a factory-built electric spa or hot tub, supplied with equipment for heating and circulating water.

(2) *standard spa portion* means the reservoir of a combination spa that is a standard spa.

(3) *combination spa* means a portable electric spa with two separate distinct reservoirs, where (i) one reservoir is an exercise spa; (ii) the second reservoir is a standard spa; and (iii) each reservoir has an independent water temperature setting control.

(4) *exercise spa (also known as a "swim spa")* means a portable electric spa that includes specific features and equipment to produce water flow for water physical therapy or physical fitness activity, including, but not limited to, swimming in place.

(5) *exercise spa portion* means the reservoir of a combination spa that is an exercise spa.

(6) *fill volume* means the water capacity of the portable electric spa, in gallons, at the halfway point between the bottom of the skimmer opening and the top of the skimmer opening. In the absence of a skimmer, the fill volume is six inches below the overflow level of the spa.

(7) *inflatable spa* means a portable electric spa where the structure is collapsible and is designed to be filled with air to form the body of the spa.

(8) *rated capacity of a portable electric spa* means the number of people capable of fitting in a portable electric spa as specified by the manufacturer.

(9) *standby mode of a portable electric spa* means that only the default settings as shipped by the manufacturer are enabled, except water temperature, which may be adjusted to meet the test conditions. No manual operations are enabled.

(10) *rated volume* means the water capacity of a portable electric spa, in gallons, as specified by the manufacturer on the spa, on the spa packaging, or the spa marketing materials.

(b) Standard requirements for portable electric spas.

(1) The normalized standby power, as defined in Table 36 of this paragraph, shall be no greater than the applicable values shown in Table 36 of this paragraph, consistent with meeting or exceeding the requirements of ANSI/APSP/ICC-14 2019 or the current version.

Table 36: Requirements for Portable Electric Spas

Appliance	Normalized Standby Power Condition	Maximum Standby Power (Watts)
Standard spas and the standard spa portion of combination spas	Where: delta Tstd = 37 degrees Fahrenheit (21 degrees Celsius)	$3.75V^{2/3} + 40$
Exercise spas and the exercise spa portion of combination spas	Where: delta Tstd = 22 degrees Fahrenheit (12.2 degrees Celsius)	$3.75V^{2/3} + 40$

Exercise spas and the exercise spa portion of combination spas capable of maintaining a minimum water temperature of 100^0F for the duration of the test	Where: delta Tstd = 37 degrees Fahrenheit (21 degrees Celsius)	$3.75V^{2/3} + 40$
Inflatable spas	Where: delta Tstd = 37 degrees Fahrenheit (21 degrees Celsius)	$7(V^{2/3})$
Where V = the fill volume, in gallons.		

(c) Test procedures for assuring compliance with the standards established in Section 509.17(b).

(1) The test method for portable electric spas is ANSI/APSP/ICC-14 2019 or the current ANSI/APSP/ICC-14 Standard.

(2) Test lab report requirements for portable electric spas:

(i) In addition to the requirements of section 5 and Appendix D of ANSI/APSP/ICC-14 2019 and California Code of Regulations, Title 20, Section 1606 Table X, as incorporated by reference in Section 509.61, test lab reports shall include: minimum and maximum water temperatures settings; copy of the label(s) per California Code of Regulations, Title 20, section 1607(d)(13)(B) , as incorporated by reference in Section 509.61; record and plot ambient air temperature (in degrees Fahrenheit), water temperature (in degrees Fahrenheit), current (in amps), and voltage (in volts) at a maximum interval of five minutes during test; and, for inflatable spas, a list of the accessories that were tested with the spa.

Section 509.18 Showerheads Efficiency Standards

(a) The following definitions refer to showerheads:

(1) *hand-held showerhead* means a showerhead that can be held or fixed in place for the purpose of spraying water onto a bather and that is connected to a flexible hose.

(2) *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.

(3) *showerhead* means a device through which water is discharged for a shower bath and includes a body sprayer and handheld showerhead but does not include a safety showerhead.

(4) *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.

(5) *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.

(6) *water use* means the quantity of water flowing through a showerhead or faucet, at point of use, determined using the test method.

(b) Standard requirements for showerheads.

(1) The flow rates of showerheads shall not be greater than 1.8 gallons per minute at 80 pounds per square inch.

(c) Test procedures for assuring compliance with the standards established in Section 509.18(b).

(1) The test methods for showerheads are:

(i) Maximum flow rate test. The test method for determining maximum flow rate of a showerhead is 10 CFR section 430.23(t) (Appendix S to Subpart B of Part 430), as incorporated by reference in Section 509.61.

(ii) Minimum flow rate test. The test method for determining minimum flow rates of a showerhead is ASME A112.18.1-2012 / CSA B125.1-2012, Section 5.12.

(iii) Showerheads with multiple nozzles. Showerheads with multiple nozzles shall be tested with all nozzles in use at the same time.

Section 509.19 Water Closets Efficiency Standards

(a) The following definitions refer to water closets:

(1) *blowout toilet* means a water closet 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.

(2) *dual-flush effective flush volume* means the average flush volume of two reduced flushes and one full flush.

(3) *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.

(4) *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.

(5) *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.

(6) *flushometer tank water closet* means a water closet utilizing a flushometer tank.

(7) *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.

(8) *gallons per flush (gpf)* means gallons per flush as determined using the applicable test method.

(9) *gravity tank-type water closet* means a water closet that includes a storage tank from which water flows into the bowl by gravity.

(10) *prison-type water closet* means a water closet designed and marketed expressly for use in prison-type institutions.

(11) *vacuum-type water closet* means a water closet whose bowl is evacuated by the application of a vacuum.

(12) *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.

(13) *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 CFR part 430, as incorporated by reference in Section 509.61.

(b) Standard requirements for water closets.

(1) The water consumption of water closets, other than those designed and marketed exclusively for use at prisons or mental health care facilities, shall be no greater than 1.28 gallons per flush or dual-flush effective flush volume.

(c) Test procedures for assuring compliance with the standards established in Section 509.19(b).

(1) The test method for testing gallons per flush of water closets is 10 CFR section 430.23(u) (Appendix T to Subpart B of part 430), as incorporated by reference in Section 509.61. The waste extraction test method for water closets is Section 7.10 of ASME A112.19.2/CSA B45.1-2013.

Section 509.20 Urinals Efficiency Standards

(a) The following definitions refer to urinals:

(1) *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.

(2) *prison-type* urinal means a urinal designed and marketed expressly for use in prison-type institutions.

(3) *trough-type urinal* means a urinal designed for simultaneous use by two or more persons.

(4) *vacuum-type urinal* means a urinal whose bowl is evacuated by the application of a vacuum.

(5) *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 10 CFR part 430 (Appendix T to Subpart B of part 430), as incorporated by reference in Section 509.61.

(6) *waterless urinal* means a urinal designed to be used without the application of water for flushing.

(b) Standard requirements for urinals.

(1) The water consumption of urinals, other than those designed and marketed exclusively for use at prisons or mental health care facilities, shall be no greater than the values shown in Table 37 of this paragraph.

Table 37: Standards for Urinals

Appliance	Maximum gallons per flush
Trough-type urinals	trough length (inches)/16
Wall mounted urinals	0.125
Other urinals	1.5

(c) Test procedures for assuring compliance with the standards established in Section 509.20(b).

(1) The test method for testing gallons per flush of urinals is 10 CFR section 430.23(v) (Appendix T to Subpart B of part 430), as incorporated by reference in Section 509.61.

Section 509.21 Residential Ventilating Fans Efficiency Standards

(a) The following definitions refer to residential ventilating fans:

(1) *residential ventilating fan* means a ceiling or wall-mounted fan, or remotely mounted in-line fan, designed to be used in a bathroom or utility room for the purpose of moving air from inside the building to the outdoors.

(2) *in-line ventilating fan* means a fan designed to be located within the building structure and that requires ductwork on both intake and exhaust. Those in-line fans with only one intake are referred to as "single port" in-line fans, while those with multiple intake ports are referred to as "multi-port" in-line fans in this specification.

(b) Standard requirements for residential ventilating fans.

(1) Efficacy Requirements:

Table 38: Requirements for Residential Ventilating Fans

Airflow (cfm)	Minimum Efficacy Level (cfm/W)*
All Residential Ventilation Fans < 90 cfm	1.4
Bathroom and Utility Room Fans ≥ – 90 to 500 cfm (max)	2.8
In-Line Fans	2.8

(c) Test procedures for assuring compliance with the standards established in Section 509.21(b).

(1) Residential ventilation fans tested in accordance with Home Ventilation Institute Publication 916 "HVI Airflow Test Procedure".

(i) Fan Efficacy (cfm/watt) is calculated using the as tested value for watts. This parameter is not included in the test report because cfm is the "normalized" value described in HVI Publication 920, and may also be derated by the Member.

Section 509.22 Water Coolers Efficiency Standards

(a) The following definitions refer to water coolers:

(1) *water cooler* means a freestanding device that consumes energy to cool and/or heat potable water. Products that have dispensing functions such as sparkling, alkaline, or flavored water, in addition to cold and hot water will also be recognized by the classification below.

(i) *cold only units*: units that dispense cold water only.

(ii) *cook and cold units*: units that dispense both cold and room-temperature water.

(iii) *hot and cold units*: units that dispense both hot and cold water. Some units may also offer room-temperature water.

(2) *water source*:

(i) *bottle-type*: a bottle or reservoir supplies water to the water cooler.

(ii) *point of use (POU):* the water cooler is connected to a pressurized water source.

(iii) *conversion-type water cooler*: a unit that ships as either Bottle-source or POU and includes a conversion kit intended to convert the Water Cooler from a Bottle-source unit to a POU unit or to convert a POU unit to a Bottle-source unit.

(3) *compartment-type water cooler* means a water cooler which, in addition to the primary function of cooling and dispensing potable water, includes a refrigerated compartment with or without provisions for making ice.

(4) *product family* means a group of product models that (i) are manufactured by the same manufacturer, (ii) use the same primary energy source, and (iii) have electrical characteristics that are essentially identical, and which do not have any differing physical or functional characteristics that affect energy consumption.

(5) test modes:

(i) *on mode with no water draw*: a test that records the 24-hour energy consumption of a water cooler with no water drawn during the test period. This test is also known as "Standby".

(ii) *on mode water draw performance (OMP)*: A metric for water draw performance that compares the energy delivered and energy consumed by the water cooler. The calculation for OMP can be found in Section 7.6 of the ENERGY STAR Water Cooler Test Method, as incorporated by reference in Section 509.61.

(b) Standard requirements for water coolers.

(1) Energy and Water Consumption Requirements:

Table 38: Requirements for Water Coolers

Water Cooler Category	Qualification Levels
On Mode with No Water Draw	
Cold only and Cook and Cold units	≤0.16 kWh/day
Hot and Cold units – Storage-type*	≤0.87 kWh/day
Hot and Cold units – On Demand	≤0.18 kWh/day

*Note: POU, dry storage compartment, and bottled water coolers are included in this category.

(2) Significant Digits and Rounding:

(i) All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Calculated results shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

(ii) Unless otherwise specified, compliance with specification limits shall be evaluated using exact values without any benefit from rounding.

(3) Additional Reporting Requirements:

(i) Report the cold water capacity per hour, tested per ANSI/ASHRAE 18-2008 (RA 2013), Section 5.7 Capacity Test for Ratings, in gallons per hour.

(ii) For all hot and cold and hot, cook, and cold units, report the hot water capacity per hour, tested per ANSI/ASHRAE 18-2008 (RA 2013), Section 5.8 Hot-Water-Dispenser Capacity Test, in number of exact 6 fl oz draws per hour.

(iii) Report the type of refrigerant used in the respective water cooler unit, for example: R-410A, R-134a, or R-290. Optional reporting requirement of refrigerant Global Warming Potential and charge amount.

(c) Test procedures for assuring compliance with the standards established in Section 509.22(b).

(1) A representative model shall be selected for testing per the following requirements:

(i) For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

(ii) For qualification of a product family, any model within that product family can be tested and serve as the representative model.

(2) When testing water coolers, the following test method shall be used to determine ENERGY STAR qualification.

Table 39: Test Method for Water Coolers

Energy Star Requirements	Qualification Levels
On Mode with No Water Draw	Energy Star Test Method for Water Coolers (Rev. May-2013), as incorporated by reference in Section 509.61

Section 509.23 Replacement Dedicated Purpose Pool Pump Motors Efficiency Standards

(a) The following definitions refer to replacement dedicated-purpose pool pump motor:

(1) *replacement dedicated-purpose pool pump motor means an electric motor that*:

(i) is single-phase or polyphase.

(ii) has a dedicated-purpose pool pump motor total horsepower of less than or equal to 5 horsepower.

(iii) is marketed for use as a replacement motor in self-priming pool filter pump, non-self-priming pool filter pump, or pressure cleaner booster pump applications.

(iv) excludes polyphase replacement dedicated-purpose pool pump motors capable of operating without a drive and is sold or offered for sale without a drive that converts single-phase power to polyphase power.

(2) *dedicated-purpose pool pump service factor* means a multiplier applied to the rated horsepower of a pump motor to indicate the percent above nameplate horsepower at which the motor can operate continuously without exceeding its allowable insulation class temperature limit.

(3) *dedicated-purpose pool pump motor total horsepower* means the product of the dedicated-purpose pool pump nominal motor horsepower and the dedicated-purpose pool pump service factor of a motor used on a dedicated-purpose pool pump based on the maximum continuous duty motor power output rating allowable for the motor's nameplate ambient rating and insulation class.

(4) *freeze protection control* means a pool pump or replacement motor control that, at a certain ambient temperature, turns on the dedicated-purpose pool pump or replacement motor to circulate water for a period of time to prevent the pool and water in plumbing from freezing.

(5) *maximum operating speed* means the rated full-load speed of a motor powered by a 60 Hertz alternating current source. Speed is expressed in revolutions per minute.

(6) *non-self-priming pool filter pump* means a pool filter pump that is not certified under NSF/ANSI 50–2015, "Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities", as incorporated by reference in Section 509.61, to be self-priming and is not capable of re-priming to a vertical lift of at least 5.0 feet with a true priming time less than or equal to 10.0 minutes, when tested in accordance with subdivision (c) of this section, and is not a waterfall pump.

(7) *pressure cleaner booster pump* means an end suction dry rotor pump designed and marketed for pressure-side pool cleaner applications, and which may be Underwriters Laboratory (UL) listed under UL 1081–2016.

(8) *self-priming pool filter pump* means a pool filter pump that is certified under NSF/ANSI 50–2015, , as incorporated by reference in Section 509.61, to be self-priming or is capable of re-priming to a vertical lift of at least 5.0 feet with a true priming time less than or equal to 10.0 minutes, when tested in accordance with subdivision (c) of this section and is not a waterfall pump.

(9) *variable-speed replacement dedicated-purpose pool pump motor* means a replacement dedicated-purpose pool pump motor that is capable of operating at a variety of user determined speeds, where all the speeds are separated by at most 100 revolutions per minute increments over the operating range and the lowest operating speed is less than or equal to one-third of the maximum operating speed and is greater than zero. Such a motor must include a variable-speed drive and be sold or offered for sale either:

(i) with a user interface that changes the speed in response to preprogrammed user preferences and allows the user to select the duration of each speed, the operational times, or both.

(ii) without a user interface that changes the speed in response to preprogrammed user preferences and allows the user to select the duration of each speed, the operational times, or both, but is unable to operate without the presence of such a user interface.

(10) *waterfall pump* means a pool filter pump with a certified maximum head less than or equal to 30.0 feet, and a maximum speed less than or equal to 1,800 revolutions per minute.

(b) Standard requirements for replacement dedicated purpose pool pump motors, as is consistent with the efficiency levels established in the California Code of Regulations, Title 20, section 1605.3(g)(6), as incorporated by reference in Section 509.61.

(1) All replacement dedicated-purpose pool pump motors shall meet a nominal efficiency at full-load and maximum operating speed of no less than the value shown in Table 40 of this paragraph.

Table 40: Standards for Replacement Dedicated-Purpose Pool Pump Motors

Dedicated-purpose pool pump motor total horsepower	Motor Phase	Nominal Efficiency at Full-Load and Maximum Operating Speed

Motor hp < 0.5 hp	Any	66%
0.5 hp ≤ Motor hp<1.0 hp	Any	72%
1.0 hp ≤ Motor hp ≤ 5.0 hp	Any	80%

(2) Replacement dedicated-purpose pool pump motors with a dedicated-purpose pool pump motor total horsepower greater than or equal to 0.5 hp shall be variable-speed replacement dedicated-purpose pool pump motors.

(3) Freeze Protection. All replacement dedicated-purpose pool pump motors with freeze protection controls, shall be shipped with freeze protection disabled or with all of the following default, user-adjustable settings:

(i) The default dry-bulb air temperature setting shall not be greater than 40^{o} Fahrenheit (F);

(ii) The default run time setting shall be no greater than 1 hour (before the temperature is rechecked); and

(iii) The default motor speed shall not be more than one half of the maximum operating speed of the motor.

(4) Replacement Dedicated-Purpose Pool Pump Motor Drive. A pool pump motor drive that is sold with a variable-speed replacement dedicated-purpose pool pump motor shall have the default speed setting of the control set at no more than 55 percent of the maximum operating speed of the motor. Any high-speed override capability shall be for a temporary period not to exceed one 24-hour cycle before automatically resetting to default settings.

(c) Test procedures for assuring compliance with the standards established in Section 509.23(b).

(1) A replacement dedicated-purpose pool pump motor shall be tested in accordance with CSA-C747-09 (Reaffirmed 2014), “Energy Efficiency Test Methods for Small Motors”, at full load and maximum operating speed. If drive is sold or offered for sale with the replacement dedicated-purpose pool pump motor, the input power of the drive while the drive is connected to the motor shall be used to determine nominal efficiency and power factor per the test procedure.

(2) Motor torque shall be recorded in lb-ft, motor speed in rotations per minute, and input power shall be recorded in watts.

(3) Power factor shall be calculated as follows.

(i) Single phase motors: Power Factor (%) = 100 x Input Power (W)/(Voltage(V) x Amps (A))

(ii) Three phase motors: Power Factor (%) = 100 x Input Power (W)/(Voltage(V) x Amps(A) x 1.73) where Voltage and Amps are the measured root mean square (rms) voltage and current.

Section 509.24 Consumer Audio and Video Products Efficiency Standards

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.25 Portable Light Fixtures

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.26 Telephones

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.27 Light Emitting Diode Lamp

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.28 Commercial Clothes Dryer

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.29 Imaging Equipment

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.30 Landscape Irrigation Controllers

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy and water savings.

Section 509.31 Outdoor Lighting

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.32 Plug-in Luminous Signs

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.33 Small Network Equipment

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy savings.

Section 509.34 Tub Spout Diverts

These products are being evaluated for future state standards to determine the appropriate standard level to avoid market disruption and maximize energy and water savings.

509.35 Commercial and Industrial Fans and Blowers

Commercial and Industrial Fans and Blowers are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.36 Automatic Commercial Ice Cube Machine

Automatic Commercial Ice Cube Machines are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.37 Ceiling Fan Light Kits

Ceiling Fan Light Kits are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.38 Commercial Pre-Rinse Spray

Commercial Pre-Rinse Spray are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.39 Commercial Refrigerators, Freezers and Refrigerator-Freezer

Commercial Refrigerators, Freezers and Refrigerator-Freezer are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.40 Illuminated Exit Signs

Illuminated Exit Signs are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.41 Incandescent Reflector Lamps

Incandescent Reflector Lamps are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.42 Very Large Commercial Packaged Air Conditioning and Heat Pumps

Very Large Commercial Packaged Air Conditioning and Heat Pumps are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.43 Metal Halide Lamp Fixtures

Metal Halide Lamp Fixtures are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.44 Vehicular Traffic Signal Modules

Vehicular Traffic Signal Modules are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.45 Pedestrian Traffic Signal Modules

Pedestrian Traffic Signal Modules are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.46 Power Supplies

Power Supplies are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.47 Torchiere Lighting Fixtures

Torchiere Lighting Fixtures are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.48 Unit Heaters

Unit Heaters are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.49 Air Compressors

Air Compressors are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.50 General Service Lamps

General Service Lamps are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.51 - Portable Air Conditioners

Portable Air Conditioners are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.52 Uninterruptible Power Supplies

Uninterruptible Power Supplies are excluded from this regulation because current federal efficiency standards preempt the state regulation.

509.53 RESERVED

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Section 509.59 Uniform Fire Prevention and Building Code Compliance

Nothing in this Part shall limit, impair, or supersede the provisions of subdivision one of section three hundred eighty-three of the Executive Law. With respect to sections 509.13, 509.15, 509.18, 509.19, and 509.20, where conflict exists with the Uniform Fire Prevention and

Building Code (Uniform Code) for product categories of faucets, gas fireplaces, showerheads, water closets, and urinals, the efficiency standards promulgated pursuant to this Part shall apply to the sale, offer for sale, lease, offer for lease, and rent or offer for rent of such products enumerated in this section. The efficiency standards shall not apply to the installation or offer to install such products enumerated in this section.

Section 509.60 Product Certification and Compliance

Certification of products to verify they meet the standard levels established herein is important to ensure compliance with this regulation. Products subject to the regulations in this Part will be required to certify compliance and may do so through the following methods: (1) the Northeast Energy Efficiency Partnerships (NEEP) State Appliance Standards Database (SASD) for all products covered within the SASD; (2) the California Energy Commissions appliance standards database(s) including but not limited to the Modernized Appliance Efficiency Database System (MAEDbS) for all other products; or (3) should neither of those databases be applicable to a particular product, a product may be certified by other substantively equivalent methods, if approved by NYSERDA in advance of their use. Directions on how to complete the compliance certification can be found at www.nyserda.ny.gov/appliance-standards.

Section 509.61 Referenced Material

The following regulations or technical materials listed in Table RM are incorporated by reference. The documents are available from the addresses listed or, in the case of Federal publications, from the National Archives, 700 Pennsylvania Avenue, NW, Washington, DC 20408, and for inspection and copying at the offices of the New York State Energy Research and Development Authority. For each reference, additional sources for hard copy materials and websites, where appropriate, are provided.

Table RM

Item	Website	Date
ANSI/AHAM AC-1-2020 for Portable Household Electric Room Air Cleaners*+	https://www.aham.org/itemdetail?iproductcode=30002&category=padstd	2020
IEC 62301 Ed. 2.0 for household electrical appliances - measurement of standby power***	https://webstore.iec.ch/publication/6789	Published January 27, 2011
10 CFR Section 430.32 ^	https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-C/section-430.32	Effective November 22, 2022
10 CFR section 430.23+++++	https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-B/section-430.23	Filed September 3, 2010
10 CFR Part 430 Subpart B Appendix C +++++	https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-B/appendix-Appendix%20C1%20to%20Subpart%20B%20of%20Part%20430	Filed September 3, 2010
10 CFR Part 430 Subpart B Appendix S +++++	https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-B/appendix-Appendix%20S%20to%20Subpart%20B%20of%20Part%20430	Filed September 3, 2010
10 CFR Part 430 Subpart B Appendix T +++++	https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-B/appendix-Appendix%20T%20to%20Subpart%20B%20of%20Part%20430	Filed September 3, 2010
ENERGY STAR V2.0 Test Method for Commercial Dishwashers +++	https://www.energystar.gov/sites/default/files/specs//Commercial_Dishwashers_Final_Test_Method.pdf	Revised May 2012
ENERGY STAR V2.0 Specification for Commercial Fryers+++	https://www.energystar.gov/ia/partners/prod_development/revisions/downloads/commercial_fryers/Final_Version_2.0_Commercial_Fryer_Specification.pdf?6f81-cd61	April 22 2011
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