

California Energy Commission
Appliance Efficiency Standards for

Refrigerators and Freezers

Room Air Conditioners

Central Air Conditioners

Gas Space Heaters

Water Heaters

Plumbing Fittings

Fluorescent Lamp Ballasts

Luminaires

and

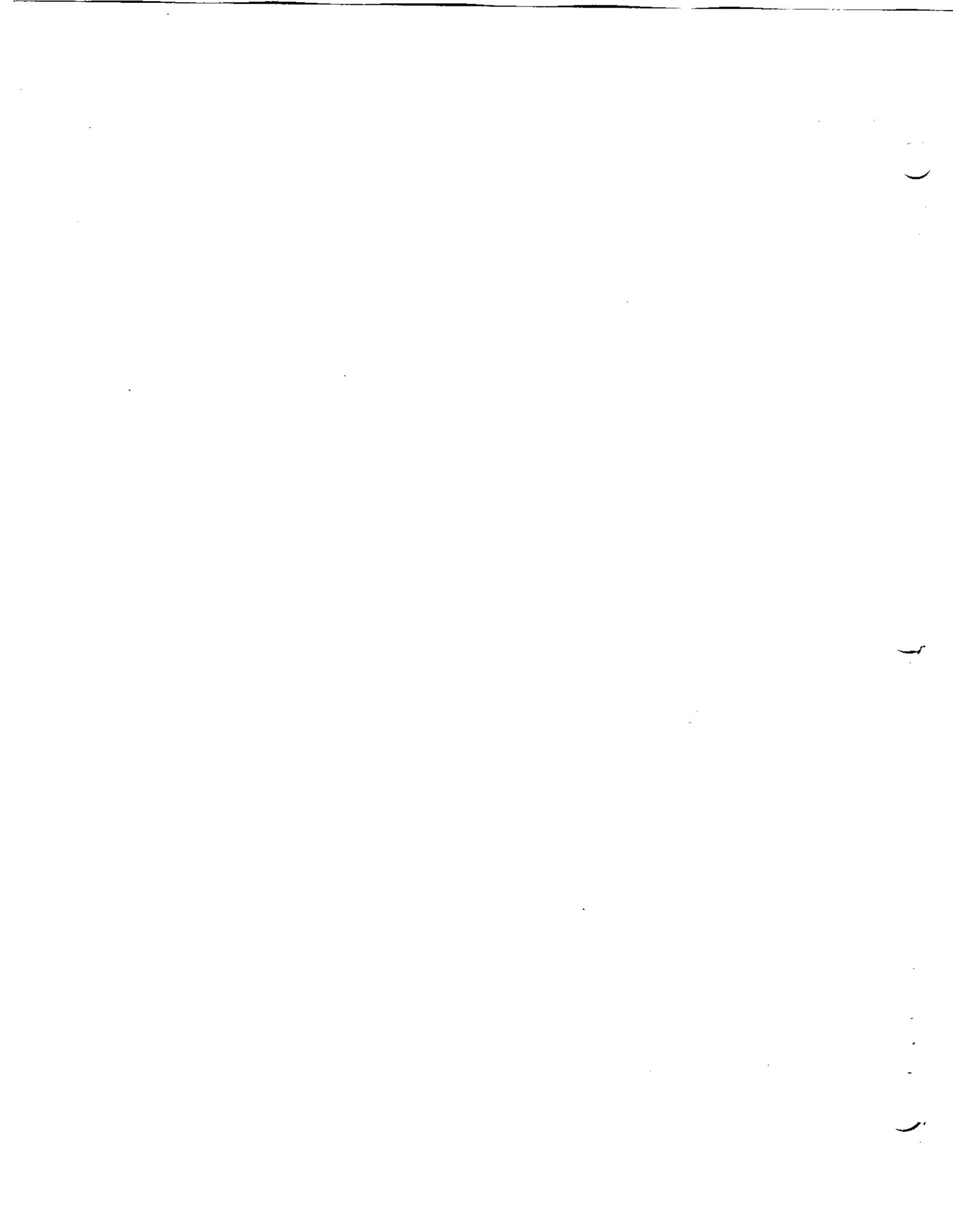
Gas Pool Heaters

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CALIFORNIA ADMINISTRATIVE CODE
TITLE 20, CHAPTER 2
SUBCHAPTER 4: ENERGY CONSERVATION
ARTICLE 4: APPLIANCE EFFICIENCY STANDARDS

1601. Scope.

The provisions of this article shall apply to the testing, certification and enforcement of efficiency standards for the following types of new appliances sold in California:

- (a) Refrigerators, refrigerator-freezers, and freezers which can be operated by alternating current electricity, excluding the following types:
 - (1) those designed expressly for use in recreational vehicles and other mobile equipment;
 - (2) those refrigerators and refrigerator-freezers with total refrigerated volume exceeding 39 cubic feet;
 - (3) those freezers with total refrigerated volume exceeding 30 cubic feet;
 - (4) those designed to be used without doors;
 - (5) those which do not include a compressor and condenser unit as an integral part of the cabinet assembly; and
 - (6) those refrigerators, refrigerator-freezers and freezers which have been certified to the Commission:
 - (A) not to be distributed in commerce for personal use by individuals,
 - (B) to comply with the requirements of Standard 1 (incorporated by reference (1984), see note following Section 1608) or Standard 7 (incorporated by reference (1983), see note following Section 1608) of the National Sanitation Foundation or Standard CRS-S1-86 of the Commercial Refrigerator Manufacturers Association (incorporated by reference (1986), see note following Section 1608).
 - (C) to have permanently displayed in an accessible place on the appliance a label stating:

"This model is not a consumer product as defined by federal law and is not designed, distributed, or intended for personal or residential use," and
 - (D) effective January 1, 1987, to have had its performance specified in the manufacturer's literature, based on the standard, ANSI/ASHRAE 117-1986, Chapter 9. (incorporated by reference (1986), see note following Section 1608).

- (b) Room air conditioners, excluding the following types:
 - (1) those installed in mobile homes at the time of construction; and
 - (2) those designed expressly for use in recreational vehicles and other mobile equipment.
- (c) Central air conditioning heat pumps, regardless of capacity, except that requirements for central air conditioning heat pumps with cooling capacity of 135,000 Btu per hour or more apply to heating performance but not cooling performance; other central air conditioners with a cooling capacity of less than 135,000 Btu per hour, excluding the following types:
 - (1) those installed in mobile homes at the time of construction;
 - (2) those designed expressly for use in recreational vehicles and other mobile equipment; and
 - (3) those designed to operate without a fan.
- (d) Gas space heaters, excluding the following types:
 - (1) gravity type central furnaces;
 - (2) heaters installed in mobile homes at the time of construction;
 - (3) heaters designed expressly for use in recreational vehicles and other mobile equipment;
 - (4) fan type central furnaces with input rates of 400,000 Btu per hour or more; and
 - (5) infrared heaters.
- (e) Water heaters, excluding the following types:
 - (1) nonstorage type electric water heaters;
 - (2) storage type water heaters installed in mobile homes at the time of construction; and
 - (3) water heaters designed expressly for use in recreational vehicles and other mobile equipment.
- (f) Plumbing fittings, including showerheads, lavatory faucets and sink faucets.

- (g) Fluorescent lamp ballasts which have all the following characteristics:
- (1) intended to operate at nominal input voltages of 120 or 277 volts;
 - (2) an input frequency of 60 Hz;
 - (3) have maximum lamp operating currents greater than 350 milliamperes and less than 500 milliamperes; and
 - (4) can be used to operate fluorescent lamp types F40T12 or F96T12 but excluding each of the following types:
 - (A) those designated to be used in ambient temperatures of 0°F or less,
 - (B) those with power factors less than 0.60,
 - (C) those designed for dimming.
- (h) Luminaires with a fluorescent lamp ballast of the type described in 1601(g) as a component.
- (i) The provisions of this article also restrict the sale of the following gas appliances if they are equipped with continuously burning pilots:
- (1) fan type central furnaces
 - (2) fan type wall furnaces
 - (3) cooking appliances
 - (4) pool heaters
- (j) The provisions of this article shall not apply to new appliances manufactured in California, but sold outside the state, nor to new appliances sold wholesale in California for final retail sale outside the state. For purposes of these regulations, the sale of a building which contains a new, permanently installed appliance is not considered the sale of a new appliance.

NOTE: Authority cited: Sections 25213, 25218(e), 25402 (c) and 25960, Public Resources Code. Reference: Sections 25402(c) and 25960, Public Resources Code.

1602. Definitions.

For the purpose of this article the following definitions shall apply:

(a) General.

- (1) "AHAM" means the Association of Home Appliance Manufacturers.
- (2) "ANSI" means the American National Standards Institute.
- (3) "ARI" means the Air-Conditioning and Refrigeration Institute.
- (4) "ASHRAE" means the American Society of Heating, Refrigerating and Air-Conditioning Engineers.
- (5) "CFR" means the Code of Federal Regulations.
- (6) "Date of sale" means the day when the appliance is physically delivered to the buyer.
- (7) "Manufacturer" means any person engaged in the original production or assembly of an appliance.

(b) Refrigerators, Refrigerator-Freezers and Freezers.

- (1) "Automatic defrost system" means a defrost system in which the defrosting action for all refrigerated surfaces is initiated and terminated automatically.
- (2) "Freezer" means a cabinet designed as a unit for the freezing and storage of food at temperatures of 0°F or below and having a source of refrigeration requiring an energy input.
- (3) "Manual defrost system" means a defrost system in which the defrosting action for all refrigerated surfaces is initiated manually.
- (4) "Partial automatic defrost system" means a defrost system in which the defrosting action for the refrigerated surfaces in the refrigerator compartment is initiated and terminated automatically and the defrosting action for the refrigerated surfaces in the freezer is initiated manually.
- (5) "Refrigerator" means a cabinet designed for the refrigerated storage of food at temperatures above 32°F, and having a source of refrigeration requiring an energy input. It may include a compartment for the freezing and storage of food at temperatures below 32°F, but does not provide a separate low temperature compartment designed for the freezing and storage of food at temperatures below 8°F.

- (6) "Refrigerator-freezer" means a cabinet which consists of two or more compartments with at least one of the compartments designed for the refrigerated storage of foods at temperatures above 32°F, and with at least one of the compartments designed for the freezing and storage of food at temperatures below 8°F which may be adjusted by the user to a temperature of 0°F or below. The source of refrigeration requires energy input.
- (7) "Upright freezer" means a freezer whose access door is at the front of the appliance.

(c) Air Conditioners.

- (1) "Air conditioner" means one or more factory made assemblies which include an evaporator or cooling coil and an electrically driven compressor and condenser combination, and may include a heating function.
- (2) "Central air conditioner" means an air conditioner which is not a room air conditioner.
- (3) "Central air conditioning heat pump" means a central air conditioner which is capable of heating by refrigeration, and which may or may not include a capability for cooling.
- (4) "Coefficient of Performance (COP)" of a heat pump means the ratio of the rate of useful heat output delivered by the complete heat pump unit (exclusive of supplementary heating) to the corresponding rate of energy input, in consistent units and under operating conditions specified in Section 1603(b) and (c). British thermal units shall be converted to kilowatt-hours at the rate of 3412 British thermal units per kilowatt-hour.
- (5) "Cooling capacity" means a measure of the ability of a unit to remove heat from an enclosed space under test conditions specified in Section 1603(b) and (c).
- (6) "Energy efficiency ratio (EER)" means the ratio of the cooling capacity of the air conditioner in British thermal units per hour, to the total electrical input in watts under test conditions specified in Section 1603(b) and (c).
- (7) "Heating seasonal performance factor (HSPF)" means the total heating output of a central air conditioning heat pump in British thermal units during its normal usage period for heating divided by the total electrical energy input in watt-hours during the same period, as determined using the test procedure specified in Section 1603(c).
- (8) "Packaged terminal air conditioner" means a room air conditioner consisting of a factory-selected combination of heating and cooling components, assemblies or sections, intended to serve an individual room or zone and constructed in a manner which complies with the definition contained in the standard, ANSI/ARI 310-1976 (incorporated by reference (1979), see note following Section 1608).

- (9) "Room air conditioner" means a factory encased air conditioner designed as a unit for mounting in a window or through a wall or as a console. It is designed for delivery of conditioned air to an enclosed space without ducts.
 - (10) "Room air conditioning heat pump" means a room air conditioner, which is capable of heating by refrigeration, and which may or may not include a capability for cooling.
 - (11) "Seasonal energy efficiency ratio (SEER)" means the total cooling output of a central air conditioner in British thermal units during its normal usage period for cooling divided by the total electrical energy input in watt-hours during the same period, as determined using the test procedure specified in Section 1603(c).
 - (12) "Single package central air conditioner" means a central air conditioner which is not a split system central air conditioner.
 - (13) "Split system central air conditioner" means a central air conditioner consisting of two or more major components; a compressor-containing unit, normally installed outside the building, and a non-compressor-containing unit, normally installed within the building.
- (d) Gas Space Heaters.
- (1) "Annual fuel utilization efficiency" of a space heater means a measure of the percentage of heat from the combustion of gas which is transferred to the space being heated during a year under conditions specified in Section 1603.
 - (2) "Boiler" means a space heater which is a self-contained appliance for supplying steam or hot water primarily intended for space heating application.
 - (3) "Central furnace" means a space heater designed to supply heated air through ducts of more than 10 inches length.
 - (4) "Duct furnace" means a space heater designed to be installed within a duct.
 - (5) "Energy consumption during standby" means the energy consumed by the gas space heater when the main burner is not operating. It does not include energy consumption related to associated cooling equipment. It shall be reported in watts, based on a conversion factor of 3.412 British thermal units per watt-hour.
 - (6) "Fan type heater or furnace" means a space heater that provides for the circulation of heated air at pressures other than atmospheric.
 - (7) "Floor furnace" means a self-contained, floor mounted space heater without ducts.

- (8) "Gravity type heater or furnace" means a space heater which provides for circulation of heated air through the differential densities of the heated air and the nonheated air.
- (9) "Infrared heater" means a space heater which directs a substantial amount of its energy output in the form of infrared energy into the area to be heated.
- (10) "Room heater" means a free-standing non-recessed space heater.
- (11) "Seasonal efficiency" of a space heater means a measure of the percentage of heat from the combustion of gas and from associated electrical equipment which is transferred to the space being heated during a year under conditions specified in Section 1603
- (12) "Space heater" means an appliance that supplies heat to a space for the purpose of providing warmth to those objects within the space.
- (13) "Steady state efficiency" or "thermal efficiency" of a space heater means a measure of the percentage of heat from the combustion of gas which is transferred to the space being heated under steady state conditions specified in Section 1603.
- (14) "Unit heater" means a self-contained fan type heater designed to be installed within the heated space.
- (15) "Wall furnace" means a wall mounted, self-contained space heater without ducts that exceed 10 inches.

(e) Water Heaters.

- (1) "Large storage type water heater" means a storage type water heater whose input rating exceeds 75,000 Btu per hour (gas), 104,000 Btu per hour (oil) or 12 kilowatts (electric).
- (2) "Mobile home storage type water heater" means a storage type water heater designed expressly for use in mobile homes.
- (3) "Small storage type water heater" means a storage type water heater whose input rating does not exceed 75,000 Btu per hour (gas), 104,000 Btu per hour (oil) or 12 kilowatts (electric).
- (4) "Standby loss of a storage type water heater" when expressed as a percent means the ratio of heat lost per hour to the heat content of the stored water above room temperature. "Standby loss of a storage type water heater" when expressed in watts per square foot means the heat lost per hour, per square foot of tank surface area.
- (5) "Storage type water heater" means a water heater that heats and stores water within the appliance at a thermostatically controlled temperature for delivery on demand.

- (6) "Thermal efficiency" or "recovery efficiency" of a water heater means a measure of the percentage of heat from the combustion of gas which is transferred to the water as measured under test conditions specified in Section 1603.
 - (7) "Water heater" means an appliance for supplying hot water for purposes other than space heating or pool heating.
- (f) Plumbing Fittings.
- (1) "Flow restricting mechanism" refers to a means or device to restrict the flow of water.
 - (2) "Lavatory faucet" means a plumbing fitting designed for discharge into a lavatory.
 - (3) "Plumbing fitting" means a device designed to control and/or guide the flow of water into or convey water from a fixture.
 - (4) "Showerhead" means a device through which water is discharged for a shower bath.
 - (5) "Sink faucet" means a plumbing fitting designed for discharge into a sink. "Sink faucet" does not include utility faucets designed for use with service sinks.
- (g) Fluorescent Lamp Ballasts.
- (1) "Fluorescent lamp ballast" means a device designed to operate fluorescent lamps by providing a starting voltage and current, and limiting the current during normal operation. "Fluorescent lamp ballasts for F40T12 lamps" means a ballast also having a rapid start circuit which provides power for maintaining hot cathodes independent of the power which provides lamp operating current.
 - (2) "Ballast efficacy factor" means the ratio of the relative light output of a ballast, expressed as a percent, to the power input, expressed in watts at the test conditions specified in Section 1603 (G) (2).
 - (3) "F40T12" means a tubular fluorescent lamp which is a nominal 40 watt lamp, 48" tube length and 1 1/2 inches in diameter. These lamps conform to the standard, ANSI C78.1-1978. (incorporated by reference (1978), see note following Section 1608).
 - (4) "F96T12" means a tubular fluorescent lamp which is a nominal 75 watts, 96" tube length and 1 1/2 inches in diameter. These lamps conform to the standard, ANSI C78.3-1978 (incorporated by reference (1978), see note following Section 1608).
 - (5) "Nominal input voltage" means an input voltage within plus 5 percent or minus 5 percent of a specified value.

- (6) "Nominal lamp watts" means the wattage at which a lamp is designed to operate and for which it is therefore rated.
- (7) "Operate" means able to start the same lamp at least 8 times out of 10 with a minimum of one minute between attempts when tested in accordance with the standard, ANSI C82.2-1977 (incorporated by reference (1977)), see note following Section 1608) at 100 percent of nominal input voltage.
- (8) "Power input" means the rate of energy consumption in watts of a ballast when tested at rated values to the test conditions specified in Section 1603(g) (2).
- (9) "Relative light output" means the test ballast light output divided by a reference ballast light output using the same reference lamp and expressing the value as a percent. These measurements are made at the ballast's rated primary voltage.
- (h) "Luminaire" means a complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.
- (i) "Household cooking gas appliance" means a gas appliance for domestic food preparation, providing at least top or surface cooking, oven cooking, or broiling.
- (j) "Pool heater" means an appliance designed for heating nonpotable water at atmospheric pressure, such as water in swimming pools, therapeutic pools, and similar applications.

NOTE: Authority cited: Sections 25213, 25218(e), 25402(c), and 25960, Public Resources Code. Reference: Sections 25402(c) and 25960, Public Resources Code.

1603. Test Methods.

- (a) Refrigerators, Refrigerator-Freezers and Freezers. The manufacturer shall cause the testing of samples of each model of refrigerator, refrigerator-freezer and freezer, to be sold in California.
- (1) Fresh food refrigerated volume, freezer refrigerated volume, and total refrigerated volume shall be determined using the standard, ANSI/AHAM HRF-1-1979 (incorporated by reference (1979), see note following Section 1608).
 - (2) The energy consumption and energy factor shall be determined using the test procedure for refrigerators and freezers in 10 Code of Federal Regulations (CFR) section 430.22(a) and (b) (1986) (incorporated by reference (1978), see note following Section 1608).
 - (3) When a refrigerator, refrigerator-freezer or freezer can be operated using either alternating current electricity or one or more other sources of primary power, the test shall be performed using alternating current electricity only.
- (b) Room Air Conditioners. The manufacturer shall cause the testing of samples of each model of room air conditioner and room air conditioning heat pump to be sold in California.
- (1) The cooling capacity, heating capacity, electrical input and energy efficiency ratio (EER) of the appliance types listed in Table B-1 shall be determined using one of the test procedures (incorporated by reference, see note following Section 1608), as appropriate, shown in Table B-1.

Table B-1

Appliance Type	Number
Room air conditioners, including room air conditioning heat pumps	room air conditioner test method in 10 CFR Section 430.22(f) (1986)
Packaged terminal air conditioners	ANSI/ARI 310 - 1985 or ANSI/ARI 380 - 1985
Computer room air conditioners	ARI 390-78

- (2) The thermal efficiency of room air conditioners with heating capability shall be determined by dividing the heating capacity by the electrical input in equivalent units.

(c) Central Air Conditioners. The manufacturer shall cause the testing of samples of each model of central air conditioner and central air conditioning heat pump to be sold in California.

(1) The cooling capacity, heating capacity, electrical input, energy efficiency ratio, seasonal energy efficiency ratio, coefficient of performance, and heating seasonal performance factor, as applicable, shall be determined using one of the test procedures (incorporated by reference, see note following Section 1608), as appropriate, shown in Table C-1.

Table C-1

Appliance Type	Number
Heat pumps, air source less than 135,000 Btu per hour.	ARI 240-81
Heat pumps, water source less than 135,000 Btu per hour.	
water source	ANSI/ARI 320-85
groundwater source	ANSI/ARI 325-85
Heat pumps, from 135,000 Btu per hour, heating function only.	ANSI/ASHRAE 90A-1980
Central air conditioners	ARI 210-81
Computer room air conditioners	ARI 390-78

The standby electrical input of air-cooled central air conditioning heat pumps manufactured on or before December 31, 1987, shall be determined by measuring the watt-hours used in a one-hour period, at 75°F plus or minus 10°F ambient conditions, starting from a cold start. The adjusted coefficient of performance shall be calculated as follows:

$$\text{Adjusted Coefficient of Performance} = \frac{\text{Rated heating capacity (watts)}}{\text{Rated electrical input (watts)} + \left[c \times \text{standby electrical input (watts)} \right]}$$

Where c = 2.5 for 47°F test and c = 0 for 17°F test.

(2) A split system central air conditioner, or a compressor-containing unit, may be sold if, and only if, the manufacturer has certified that the compressor-containing unit, when tested with the noncompressor-containing unit most likely to represent the highest national sales volume, is in compliance with the provisions of these regulations.

(d) Gas Space Heaters. The manufacturer shall cause the testing of samples of each model of gas space heater to be sold in California. Models of gas space heaters intended for use either with natural gas or liquefied petroleum gases may be tested with natural gas and the results applied to both fuel types.

(1) The seasonal efficiency of gas fan type central furnaces shall be calculated using the following formula:

$$\text{Seasonal efficiency} = \frac{\left[\frac{\text{annual fuel energy consumption (Btu)}}{\text{annual fuel utilization efficiency}} \right] + \left[\frac{\text{annual auxiliary electrical energy consumption which provides heat to heated space (kWh)} \times \frac{3412 \text{ Btu}}{\text{kWh}} \right]}{\left[\frac{\text{annual fuel energy consumption (Btu)}}{\text{annual fuel utilization efficiency}} \right] + \left[\frac{\text{total annual auxiliary electrical energy consumption (kWh)} \times \frac{10236 \text{ Btu}}{\text{kWh}} \right]}$$

The steady state efficiency, annual fuel energy consumption, annual auxiliary electrical energy consumption which provides heat to the heated space, total annual auxiliary electrical energy consumption and annual fuel utilization efficiency of gas fan type central furnaces shall be determined using the test procedure for central furnaces in 10 Code of Federal Regulations Section 430.22(n) (1986) (incorporated by reference, see note following Section 1608).

(2) Until December 31, 1986, gas fan type central nonweatherproof upflow and downflow furnaces shall be tested as "units intended to be installed outdoors or in an unheated space," as used in Sections 4.6 of Appendix N of the Department of Energy test method specified by this section, and shall be tested as furnaces as described by Table 7 of the standard, ANSI/ASHRAE 103-1982 (incorporated by reference (1982), see note following Section 1608).

- (3) Effective January 1, 1988, gas fan type central nonweatherproof furnaces shall be tested as isolated combustion systems as defined in Appendix N of the Department of Energy test method specified by this section, and shall be tested as furnaces as described by Table 7 of the standard, ANSI/ASHRAE 103-1982 (incorporated by reference (1982), see note following Section 1608).
- (4) From January 1, 1987 through December 31, 1987, the manufacturers of gas fan type central nonweatherproof furnaces shall have the option of using (2) or (3) above.
- (5) Effective January 1, 1987, gas boilers shall be tested as isolated combustion systems as defined in Appendix N of the Department of Energy test method specified in this section, and shall be tested as boilers as described by Table 7 of the standard, ANSI/ASHRAE 103-1982 (incorporated by reference (1982), see note following Section 1608).
- (6) The seasonal efficiency of wall furnaces, floor furnaces and room heaters shall be calculated using the following formula.

$$\begin{array}{l}
 \left[\begin{array}{l} 200 \text{ x rated input x annual} \\ \text{(hours) (Btu/hour) fuel} \\ \text{utilization} \\ \text{efficiency} \end{array} \right] + \left[\begin{array}{l} 200 \text{ x maximum} \\ \text{(hours) electrical x 3.412} \\ \text{power input} \\ \text{(watts) (Btu/Wh)} \end{array} \right] + \left[\begin{array}{l} 3560 \text{ x electrical} \\ \text{(hours) energy} \\ \text{use during} \\ \text{standby} \\ \text{(watts) (Btu/Wh)} \end{array} \right] \\
 \hline
 \text{Seasonal Efficiency} = \frac{\left[\begin{array}{l} 200 \text{ x rated} \\ \text{(hours) input} \\ \text{(Btu/hour)} \end{array} \right] + \left[\begin{array}{l} 200 \text{ x maximum} \\ \text{(hours) electrical x 10.236} \\ \text{power input} \\ \text{(watts) (Btu/Wh)} \end{array} \right] + \left[\begin{array}{l} 8560 \text{ x electrical} \\ \text{(hours) energy} \\ \text{use during} \\ \text{standby} \\ \text{(watts) (Btu/Wh)} \end{array} \right]}{1}
 \end{array}$$

The rated input, annual fuel utilization efficiency, maximum electrical power input and electrical energy used during standby shall be determined using the test procedure for home heating equipment in 10 Code of Federal Regulations Section 430.22 (o) (1986) (incorporated by reference, see note following Section 1608).

- (7) Thermal efficiency, annual fuel utilization efficiency and energy consumption during standby of all other gas space heaters shall be measured using one of the standards (incorporated by reference, see note following Section 1608) in Table D-1.

Table D-1

Effective Date	Appliance Type	Number
Until December 31, 1986	Room heaters	Z21.11.1 - 1977
	Boilers	Z21.13 - 1977
	Wall furnaces	Z21.44 - 1981
	Floor furnaces	Z21.48 - 1979
	Wall furnaces	Z21.49 - 1979
	Unit heaters	Z83.8 - 1981
	Duct furnaces	Z83.9 - 1982
January 1, 1987	Boilers less than 300,000 Btu/hr	10 CFR Section 430.22(n)(1986)
	300,000 Btu/hr or more	Z21.13-1982
	Unit heaters	Z83.8-1981
	Duct Furnaces	Z83.9-1982

- (e) Water Heaters. The manufacturer shall cause the testing of samples of each model of water heater to be sold in California. Models of water heaters intended for use either with natural gas or liquefied petroleum gases may be tested with natural gas and the results applied to both fuel types.
- (1) The recovery efficiency, standby loss and volume of small storage type and large electric water heaters shall be measured using the test procedure for water heaters in 10 Code of Federal Regulations section 430.22(e) (1986) (incorporated by reference, see note following Section 1608).
 - (2) The thermal efficiency, standby loss and volume of all other water heaters (where applicable) shall be measured using the standard, ANSI Z21.10.3-1984 (incorporated by reference (1984), see note following Section 1608).

- (f) Plumbing Fittings. The manufacturer shall cause the testing of samples of each model of showerhead, lavatory faucet and sink faucet to be sold in California by a laboratory approved by the Executive Director. The method of testing shall be the standard, ANSI A112.18.1M-1979 (incorporated by reference (1979), see note following Section 1608). A laboratory approved by the Executive Director means one that documents that it has completed tests using the standard ANSI A112.18.1M-1979. Effective January 1, 1987, when a flow restricting mechanism is incorporated as a component of a showerhead, it shall be mechanically retained at the point of manufacture. Mechanically retained shall mean that the insert cannot be shaken out of the showerhead, but would require a force of at least eight pounds to remove the insert. All showerheads with the flow restrictors mechanically retained at the point of manufacture shall be tested with the flow restrictor mechanism in place. Showerheads with a radially drilled hole which is sealed when the flow restricting mechanism is in position, but which sprays water out of the side of the showerhead when the flow restricting mechanism is removed shall also be tested with the flow restricting mechanism in place. Other showerheads in which a flow restricting mechanism is not mechanically retained at the point of manufacture shall be tested with the flow restricting mechanism removed.
- (g) Fluorescent Lamp Ballasts. The manufacturer shall cause the testing of samples of each model of fluorescent lamp ballast to be sold in California of the type described in subsection 1601(g).
- (1) A sample of sufficient size of each model shall be tested to insure that the ballast efficacy factor certified under the provisions of Section 1606 shall be no greater than the mean of the sample or the lower 97-1/2 percent confidence limit of the true mean divided by 0.95. A minimum of four ballasts of each model shall be randomly selected and tested at least once a year.
 - (2) The power input, and relative light output shall be determined in accordance with the standard, ANSI C82.2-1977 (incorporated by reference (1977), see note following Section 1608).

NOTE: Authority cited: Sections 25213, 25218(e) and 25402(c), Public Resources Code. Reference: Sections 25402(c), Public Resources Code; Code of Federal Regulations. title 10, sections 430.22(a), (b), (e) (f), (n), (o).

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1604. Efficiency Standards.

- (a) Refrigerators, Refrigerator-freezers and Freezers. The energy consumption of all new refrigerators, refrigerator-freezers and freezers, manufactured on or after the date specified in Tables A-1 and A-2 shall be certified not to exceed the values shown in Tables A-1 and A-2.

Table A-1

Effective Date	Appliance	Annual Energy Consumption (kWh)
November 3, 1979	Refrigerators	30.42V + 487
	Refrigerator-freezers	
	with automatic defrost systems	
	- with anti-sweat heater switch	55.00V + 487
	- without anti-sweat heater switch	60.83V + 487
	all others	48.67V + 487
	Upright freezers	
	with automatic defrost systems	
	- with anti-sweat heater switch	65.00V + 460
	- without anti-sweat heater switch	68.94V + 460
all others	45.96V + 460	
Other freezers	37.85V + 379	

V = the total refrigerated volume in cubic feet.

Table A-2

Appliance	Defrost	Style	Annual Energy Consumption (kWh)	
			Effective Jan. 1, 1987	Effective Jan. 1, 1992
Refrigerators	Manual ¹	All	17.3 AV + 340	13.7 AV + 267
Refrigerator-freezers less than 9 cubic feet	All	All ²	24.7 AV + 486	17.4 AV + 344
Refrigerator-freezers 9 cubic feet or larger	Manual	All ²	24.7 AV + 486	17.4 AV + 344
	Partial automatic	All	24.7 AV + 486	17.4 AV + 344
	Automatic	Top mounted ³ freezer	24.1 AV + 487	16.7 AV + 336
	Automatic	Side mounted freezer	30.3 AV + 535	22.4 AV + 395
	Automatic	Bottom mounted freezer	30.3 AV + 535	22.4 AV + 395
	Automatic	Top mounted freezer with through the door ice service	26.8 AV + 540	18.5 AV + 374
	Automatic	Side mounted freezer with through the door ice service	33.6 AV + 594	24.8 AV + 438
Freezers	Manual	Upright	21.4 V + 480	14.5 V + 324
	Automatic	Upright	33.7 V + 755	21.3 V + 477
	All	Chest	14.8 V + 384	10.9 V + 282

AV =adjusted volume = $[1.63 \times \text{freezer volume}(\text{ft}^3)] + \text{refrigerator volume}(\text{ft}^3)$.

V =freezer volume (ft³).

1. This classification includes refrigerators with partial automatic defrost systems.
2. This classification includes refrigerators with automatic defrost systems.
3. This classification includes refrigerator-freezers with internally mounted freezers.

- (b) Room Air Conditioners. The energy efficiency ratio and thermal efficiency (where applicable) of all new room air conditioners manufactured on or after the date specified in Table B-2. shall be certified to be not less than the values shown. The energy efficiency ratio of room air conditioners, labeled for use at more than one voltage shall be certified not to be less than the values shown at each of the labeled voltages.

Table B-2

Effective Date	Appliance	Energy Efficiency Ratio	Thermal Efficiency
December 22, 1978	Room air conditioners		
	. those with heating capability		90%
November 3, 1979	Room air conditioners		
	. those designed for use with a supply of at least 200 volts	8.2	
	. other heat pumps	8.3	
	. all other room air conditioners	8.7	

- (c) Central Air Conditioners. The energy efficiency ratio, seasonal energy efficiency ratio, coefficient of performance, and/or heating seasonal performance factor, as applicable, of all new central air conditioners, manufactured on or after the date specified in Table C-2 shall be certified to be not less than the values shown. The energy efficiency ratio, seasonal energy efficiency ratio, coefficient of performance, and/or heating seasonal performance factor, as applicable, of central air conditioners, including heat pumps labeled for use at more than one voltage shall be certified not to be less than the values shown at each of the labeled voltages.

Table C-2

Effective Date	Appliance	Energy Efficiency Ratio	Seasonal Energy Efficiency Ratio	Coefficient of Performance	Heating Seasonal Performance Factor
December 22, 1980	Central air conditioners less than 65,000 Btu per hour				
	heat pumps	7.5	-	-	-
	water-cooled air conditioners	8.0	-	-	-
	computer room air conditioners	8.0*	-	-	-
	all others	-	8.0	-	-
January 1, 1984	Central air conditioners 65,000 to 135,000 Btu per hour (including heat pumps)				
	air source	8.2	-	-	-
	water source	9.2	-	-	-
	evaporative source	9.2	-	-	-
January 1, 1988	Central air conditioners less than 65,000 Btu per hour				
	air-cooled, (excluding heat pumps)	-	8.9	-	-
	air source heat pumps	-	8.9	-	6.6
	water source heat pumps	9.0	-	3.2	-
January 1, 1993	Central air conditioners less than 65,000 Btu per hour				
	air cooled, (excluding heat pumps)	-	9.9	-	-
	air source heat pumps	-	9.9	-	6.8
	water source heat pumps	10.0	-	3.5	-

*When tested using ARI Standard 390-78 (incorporated by reference (1978), see note following Section 1608).

The adjusted coefficient of performance of all new central air conditioning heat pumps manufactured on or between the dates specified in Table C-3 shall be certified not to be less than the values shown. The adjusted coefficient of performance of central air conditioners labeled for use at more than one voltage shall be certified not to be less than the values shown at each of the labeled voltages.

Table C-3

Effective Date	Appliance	Adjusted Coefficient of Performance Air Source		Coefficient of Performance Water Source
		47° outdoor temp.	17° outdoor temp.	
November 3, 1979 through December 31, 1987	Central air conditioning heat pumps less than 65,000 Btu/hour	2.5	1.5	2.5
November 3, 1979	Central air conditioning heat pumps not less than 65,000 Btu/hour	2.5	1.5	2.5

(d) Gas Space Heaters.

- (1) The seasonal efficiency of all new fan type gas central furnaces manufactured on or after the dates specified in Table D-2 shall be certified not to be less than the values shown.

Table D-2

Effective Date	Appliance	Seasonal Efficiency
December 22, 1982	Gas fan type central furnaces with input rate less than 175,000 Btu per hour, except those combined with a single package central air conditioner with rated cooling capacity exceeding 65,000 Btu per hour.	71%*
December 22, 1984	Gas fan type central furnaces with input rate of 175,000 Btu per hour or more, and those combined with a single package central air conditioner with rated cooling capacity exceeding 65,000 Btu per hour.	71%*
January 1, 1987 through December 31, 1987	Gas fan type central furnaces weatherproof nonweatherproof	71%* 71%* or 72%** Determined by test method chosen by manufacturer.
January 1, 1988	Gas fan type central furnaces weatherproof nonweatherproof	71%* 72%**

*When using DOE outdoor test procedure (1603(d)(2)).

**When using DOE isolated combustion system test procedure (1603(d)(3)).

- (2) The efficiency of all other new gas space heaters manufactured during the period specified in Tables D-3, D-4, and D-5 shall be certified not to be less than the values shown, and the energy consumption during standby (with the exceptions noted below) shall be certified not to exceed the values shown.

Table D-3

Effective Date	Appliance	Seasonal Efficiency
January 1, 1987	Wall,	
	fan type	
	up to 42,000 Btu/hour	73%
	over 42,000 Btu/hour	74%
	gravity type	
	up to 10,000 Btu/hour	59%
	over 10,000 Btu/hour up to 12,000 Btu/hour	60%
	over 12,000 Btu/hour up to 15,000 Btu/hour	61%
	over 15,000 Btu/hour up to 19,000 Btu/hour	62%
	over 19,000 Btu/hour up to 27,000 Btu/hour	63%
	over 27,000 Btu/hour up to 46,000 Btu/hour	64%
	over 46,000 Btu/hour	65%
	Floor	
	up to 37,000 Btu/hour	56%
	over 37,000 Btu/hour	57%
	Room	
up to 18,000 Btu/hour	57%	
over 18,000 Btu/hour up to 20,000 Btu/hour	58%	
over 20,000 Btu/hour up to 27,000 Btu/hour	63%	
over 27,000 Btu/hour up to 46,000 Btu/hour	64%	
over 46,000 Btu/hour	65%	

*For space heaters designed expressly for use with liquefied petroleum gases, the maximum energy consumption during standby shall not exceed 147 watts.

Table D-4

Effective Date	Appliance	Energy Consumption During Standby	Annual Fuel Utilization Efficiency	
January 1, 1987	Boilers with capacity under 300,000 Btu/hour	weatherproof, without continuous pilot	10 watts*	63%
		with continuous pilot	147 watts*	61%
		nonweatherproof, without continuous pilot	10 watts*	65%
		with continuous pilot	147 watts*	63%

*For boilers designed expressly for use with liquefied petroleum gases, the maximum energy consumption during standby shall not exceed 293 watts.

Table D-5

Effective Date	Appliance	Energy Consumption During Standby	Thermal Efficiency
December 22, 1981 through December 31, 1986	Gas space heaters		
	Wall,		
	fan type	10 watts*	80%
	gravity type	147 watts	70%
	Floor,		
	fan type	10 watts*	70%
	gravity type	147 watts	65%
December 22, 1983	Room with capacity over 20,00 Btu/hour	147 watts	70%
	others	147 watts	65%
	Boilers	147 watts**	75%
	Unit	10 watts*	80%
	Duct	10 watts*	80%
January 1, 1987	Boilers with capacity of 300,000 Btu/hour or more	147 watts**	75%

*For space heaters designed expressly for use with liquefied petroleum gases, the maximum energy consumption during standby shall not exceed 147 watts.

**For boilers designed expressly for use with liquefied petroleum gases, the maximum energy consumption during standby shall not exceed 352 watts for those with capacity over 300,000 Btu/hour or 293 watts for all others.

(e) Water Heaters.

- (1) The recovery efficiency or thermal efficiency (as applicable) of all new water heaters manufactured on or after the date specified in Table E shall be certified to be not less than the values shown and the standby loss shall be certified not to exceed the values shown.

Table E

Effective Date	Appliance	Standby Loss	Recovery Efficiency	Thermal Efficiency
May 21, 1981	Water heaters			
	Electric, mobile home storage type	4 watts per square foot	no requirement	no requirement
	Electric, all other storage type	35 watts or 4 watts per square foot, whichever is larger	no requirement	no requirement
	Gas, mobile home with storage capacity of less than 25 gallons	7.5 percent	75 percent	no requirement
	25 up to 35 gallons	7.0 percent	75 percent	no requirement
	35 gallons or more	6.0 percent	75 percent	no requirement
	Gas, small storage type, other than mobile home type (basic standard)	$2.3 + \frac{67}{V}$ percent	76 percent	no requirement
(alternative standard at manufacturer's option)	$1.3 + \frac{67}{V}$ percent	74 percent	no requirement	
Gas, large storage type	$2.3 + \frac{67}{V}$ percent	no requirement	76 percent	
Gas, all others		no requirement	no requirement 75 percent	

Where V is the nominal volume in gallons.

- (f) Plumbing Fittings. Effective December 22, 1978 the maximum flow rate of all new showerheads, lavatory faucets, and sink faucets shall not exceed the values specified in the standard, ANSI A112.18.1M-1979 (incorporated by reference (1979), see note following Section 1608).
- (g) Fluorescent Lamp Ballasts. The ballast efficacy factor of fluorescent lamp ballasts manufactured on or after the date specified in Table G shall be certified to be not less than the values shown.

Table G

Effective Date	Application for Operation of	Ballast Input Voltage	Total Nominal Lamp Watts	Ballast Efficacy Factor	
June 2, 1983	one	F40T12	120	40	1.805
			277	40	1.805
	two	F40T12	120	80	1.060
			277	80	1.050
	two	F96T12	120	150	0.570
			277	150	0.570

NOTE: Authority cited: Sections 25213, 25218(e) and 25402(c), Public Resources Code. Reference: Section 25402(c), Public Resources Code.

1605. Continuously Burning Pilots.

New gas appliances of the following types shall not be sold or offered for sale if they are equipped with continuously burning pilots:

- Fan type central furnaces
- Household cooking appliances
- Fan type wall furnaces
- Pool heaters

This restriction shall not apply to:

- Appliances designed to burn only liquefied petroleum gases
- Appliances designed expressly for use in mobile homes and recreational vehicles
- Cooking appliances which do not have an electrical line voltage supply connection and have three or less continuously burning pilots

NOTE: Authority cited: Sections 25213, 25218(e), 25402(c), and 25960, Public Resources Code. Reference: Sections 25402(c) and 25960, Public Resources Code.

1606. Certification.

- (a) No new appliance described in Subsections 1601(a) through (g) of which was manufactured on or after the effective dates listed in Section 1604 of these regulations shall be sold or offered for sale in California, which is not certified by its manufacturer to be in compliance with the provisions of these regulations.
- (b) The manufacturer shall submit a certification statement to the executive director for each model, containing the following information, except as provided in subsections (c) and (d):
 - (1) Name and address of manufacturer.
 - (2) Type of appliance.
 - (3) Brand name.
 - (4) Model number, as it appears on the appliance name plate.
 - (5) Name and address of laboratory where test for efficiency was performed.
 - (6) Date of test for efficiency.
 - (7) Results of the test for efficiency as follows:
 - (A) Refrigerators and Freezers.
 - 1. Energy consumption with antisweat heater switches on (kilowatt-hours per year).
 - 2. Energy consumption with antisweat heater switches off (kilowatt-hours per year).
 - 3. Mean of items 1 and 2.
 - 4. Fresh food refrigerated volume (cubic feet).
 - 5. Freezer refrigerated volume (cubic feet).
 - 6. Total refrigerated volume (cubic feet).
 - (B) Room Air Conditioners.
 - 1. Type (heating and cooling or cooling only).
 - 2. Test procedure used.
 - 3. Voltage.
 - 4. Cooling capacity (Btu per hour).
 - 5. Power input, while cooling (watts).
 - 6. Energy efficiency ratio (Btu per watt-hour).
 - 7. Heating capacity (Btu per hour).
 - 8. Power input, while heating (watts).
 - 9. Thermal efficiency (percent).
 - (C) Central Air Conditioners. Information on form entitled Central Air Conditioner and Heat Pump Certification Form (incorporated by reference (1983), see note following Section 1608).
 - (D) Gas Space Heaters. Information on the applicable form entitled Gas and Oil Fan Type Central Furnace Certification Form (incorporated by reference (1983), see note following Section

1608)., Boiler Certification Form (incorporated by reference (1987), see note following Section 1608).or Gas Space Heater Certification Form (excluding central furnaces and boilers) (incorporated by reference (1986), see note following Section 1608).

(E) Water Heaters.

1. Tank surface area (of electric water heaters).
2. Description of method of calculating tank surface area (of electric water heaters).
3. Recovery efficiency (percent).
4. Standby loss (percent).
5. Standby loss (watts and watts per square foot).

(F) Plumbing Fittings. Information on the form entitled Plumbing Fitting Certification Form (incorporated by reference (1986), see note following Section 1608).

(G) Fluorescent Lamp Ballasts.

1. Relative light output for each lamp for each sample unit (percent).
2. Sample average relative light output (percent).
3. Ballast power input for each sample unit (watts).
4. Sample average ballast power input (watts).
5. Sample ballast efficacy factor.

(8) Sufficient information about the model number or other identification by which the date of manufacture can be readily ascertained.

(9) A declaration that the appliance model complies with Article 4, Subchapter 4, of Title 20, of the California Administrative Code.

(c) In lieu of submitting to the Commission the detailed information specified in Subsection 1606(b), a manufacturer of plumbing fittings may submit the same or similar information to an industry or governmental certification agency, providing that the certification agency meets the following criteria:

The agency must conduct a testing, listing, and labeling program for the type of plumbing fitting involved.

The managing committee of the program must include persons representing manufacturers of plumbing fittings, users of plumbing fittings, and general interest.

The formal procedures of the program must include means of obtaining consensus (as defined by the American National Standards Institute) on all aspects of the program. They must also include formal procedures for appealing any action or inaction of the program.

The agency must agree to allow a representative of the Commission to participate in managing committee meetings and witness testing if so requested.

The agency must agree to make available to the Commission adequate data for the Commission to publish directories of plumbing fittings which comply with the requirements of these regulations.

The agency must also agree to take action to follow up individual complaints of inaccurate listing of plumbing fittings within 30 days.

Any application from an agency claiming to meet the criteria of this subsection shall be the subject of a public hearing before being ruled upon by the executive director.

- (d) The manufacturer of luminaires of the type described in subsection 1601(h) shall submit a certification statement to the executive director, containing a statement that only luminaires which contain certified ball-asts will be sold or offered for sale in California.
- (e) Every certification statement shall be dated and signed by the manufacturer attesting to its truth and accuracy under penalty of perjury. Where the manufacturer is either a corporation or a business association, the certification statement shall be dated, signed and attested to by an officer thereof.
- (f) Within 45 days after receipt of a certification statement, the executive director shall forward to the manufacturer, an acknowledgement that the statement has been received and stating whether it is complete and accurate on its face.

For purposes of Subsection (a) certification of a model shall be deemed to occur upon forwarding of the acknowledgement by the executive director. If acknowledgement is not forwarded in a timely manner, certification shall be deemed to occur on the 45th day after receipt of the certification statement.

NOTE: Authority cited: Sections 25213, 25218(e) and 25402(c), Public Resources Code. Reference: Sections 25402(c) and 25960, Public Resources Code.

1607. Identification of Complying Appliances.

- (a) Sufficient information shall be shown on the outside of the shipping carton for any appliance described in Subsections 1601(a) through 1601(h) (and unit carton in the case of plumbing fittings) to permit the determination of whether the appliance complies with the requirements of this article. The manufacturer may display the following information on the outside of the carton to show compliance.
- (1) The Commission's compliance seal;
 - (2) The appropriate measure of energy consumption or efficiency;
 - (3) The model number as it has been certified and information to determine date of manufacture; or
 - (4) Other information sufficient to show compliance.
- (b) Effective January 1, 1987, the words "3.0 gpm max", or the actual tested flow rate, or other conspicuous marking approved by the executive director, shall additionally be marked on each plumbing fitting sold or offered for sale either by means of a permanent marking on the fitting or on a label attached to the fitting, and also upon the unit carton in which the fitting is offered for retail sale.
- (c) The executive director or his designee may require additional information if necessary to permit determination of compliance.
- (d) The manufacturer's name or brand name shall appear on each appliance.
- (e) Any appliance described in subsections 1601(a) through (g), excluding (f), which is manufactured on or after July 1, 1984, and for which Section 1604 specifies an effective date that is prior to July 1, 1984, may not be sold or offered for sale unless the date of manufacture is permanently displayed in an accessible place on that appliance.
- (f) Any appliance described in subsections 1601(a) through (g), excluding (f), which is manufactured on or after July 1, 1984, and for which Section 1604 specifies an effective date that is subsequent to July 1, 1984, may not be sold or offered for sale unless the month and year of manufacture, or the week and year if identified as such on the appliance, is permanently displayed in an accessible place on that appliance.
- (g) An accessible place is a place that can be easily seen without the need for tools to remove any covering when the appliance is on display in a store or when it is installed.

NOTE: Authority cited: Sections 25213, 25218(e), and 25402(c), Public Resources Code. Reference: Sections 25402(c), Public Resources Code.

1608. Enforcement.

- (a) Notwithstanding the provisions of Section 1606 of these regulations, the executive director shall have authority to challenge the efficiency test results provided by the manufacturer and cause the appliance model to be retested at any voltage for which it is labeled.
- (b) The executive director shall cause periodic inspections to be made of manufacturers, distributors or retailers of the new appliances described in Section 1601, including appliances that have been or are to be installed by contractors or builders at building sites, in order to determine their compliance with these regulations.
- (c) The test would involve one unit selected by the executive director.
 - (1) If the performance of the appliance falls within the tolerances listed below, no further action is necessary, and the Commission will pay the cost of testing.

Appliance	Characteristic	Tolerance Limits (percent of certified value)
Refrigerators Refrigerator-freezers Freezers	Volume	Not less than 98.5 percent
	Energy consumption	Not more than 110 percent
Room air conditioners (including heat pumps and packaged terminal air conditioners)	Cooling capacity	Not less than 95 percent
	Energy consumption when cooling	Not more than 110 percent
	Heating capacity	Not less than 95 percent
	Energy consumption when heating	Not more than 110 percent
Central air condi- tioners (including heat pumps)	Cooling capacity	Not less than 95 percent
	Energy efficiency ratio	Not less than 95 percent
	Seasonal energy efficiency ratio	Not less than 95 percent
Central air condi- tioning heat pumps, when heating	Heating capacity	Not less than 95 percent
	Coefficient of performance	Not less than 95 percent
	Heating seasonal performance factor	Not less than 95 percent
Central gas furnaces	Seasonal efficiency	Not less than 95 percent
	Steady state efficiency	Not less than 100 percent
All Other gas space heaters	Seasonal efficiency	Not less than 95 percent
	Annual fuel utilization efficiency	Not less than 95 percent
	Thermal efficiency	Not less than 100 percent
	Energy consumption during standby	Not more than 100 percent
Small storage type water heaters	Recovery efficiency	Not less than 97.5 percent
	Standby loss	Not more than 115 percent
Other water heaters	Recovery efficiency	Not less than 100 percent
	Thermal efficiency	Not less than 100 percent
	Standby loss	Not more than 100 percent
Plumbing fittings	Water flow rate	Not more than 110 percent
Fluorescent lamp ballast	Ballast efficacy factor	Not less than 100 percent

If the performance of the appliance does not fall within the tolerances listed above, the manufacturer must pay the cost of testing and take whatever steps are necessary either to recertify the appliance at a lower efficiency rating or to provide information to the satisfaction of the executive director that:

- (A) in the initial certification of the model, the method of selecting the test sample complied with the requirements of Section 1603, and
- (B) in the initial certification of the model, the value certified was in conformance with the requirements of Section 1603.

Even if this information is provided, the manufacturer shall be required to test a second unit, selected by the executive director, in a laboratory acceptable to the executive director, at the manufacturer's expense.

- (3) If the performance of that second unit described in subsection (c)(2) falls within the tolerances listed in subsection (c)(1), no further action will be taken. If the performance of that second unit does not fall within those tolerances, the certification for that model shall be suspended by Commission order.
- (4) If any of the tests of units required by the executive director pursuant to this subsection are not undertaken by a manufacturer, the certification for that model shall be suspended by Commission order.
- (5) Prior to issuing an order suspending certification of any model, the Commission shall hold hearings as may be authorized by the provisions of Cal. Admin. Code, Sections 1230 et seq.

NOTE: Authority cited: Sections 25213, 25218(e), and 25402(c), Public Resources Code. Reference: Section 25402(c), Public Resources Code.

NOTE:

The following documents are referenced in Sections 1601-1608:

(a) California Energy Commission

- (1) Central Air Conditioner and Heat Pump Certification Form (CEC 93 Rev 11/86)
- (2) Gas and Oil Fan Type Central Furnace Certification Form (CEC 92 Rev 9/83)
- (3) Boiler Certification Form (CEC 97 Rev 1/87)
- (4) Gas Space Heater Certification Form (excluding central furnaces and boilers) (CEC 94 Rev 2/86)
- (5) Plumbing Fitting Certification Form (CEC 95 Rev 10/86)

Copies available from:
California Energy Commission
New Building and Appliance Efficiency Office
1516 Ninth Street, MS 25
Sacramento, CA 95814

(b) Federal Test Methods

Code of Federal Regulations, Title 10, Section 430.22 (1986).

Copies available from
Superintendent of Document
U.S. Government Printing Office
Washington, D.C. 20402

(c) Air-Conditioning and Refrigeration Institute (ARI)

- (1) ARI 210-81 Standard for Unitary Air-Conditioning Equipment (1981)
- (2) ARI 240-81 Standard for Air-Source Unitary Heat Pump Equipment (1981)
- (3) ANSI/ARI 310-85 Standard for Packaged Terminal Air-Conditioners (1985)
- (4) ARI 310-76 Standard for Packaged Terminal Air Conditioners (1976)
- (5) ANSI/ARI 320-85 Standard for Water-Source Heat Pumps (1985)
- (6) ANSI/ARI 325-85 Standard for Ground Water-Source Heat Pumps (1985)
- (7) ANSI/ARI 380-85 Standard for Packaged Terminal Heat Pumps (1985)

- (8) ARI/390-78 Standard for Computer Room Unitary Air-Conditioning Equipment (1978)

Copies available (except 390-78) from:
Air-Conditioning and Refrigeration Institute
1501 Wilson Boulevard
Arlington, VA 22209

Copies of 390-78 available from:
California Energy Commission
New Building and Appliance Efficiency Office
1516 Ninth Street
Sacramento, CA 95814

(d) American National Standards Institute (ANSI)

- (1) ANSI A112.18.1M-1979 Finished and Rough Brass Plumbing Fixture Fittings (1979)

Copies available from:
American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017

- (2) ANSI C78.1-1978 Dimensional and Electrical Characteristics of Fluorescent Lamps, Rapid Start Types (1978)
- (3) ANSI C78.3-1978 Dimensional and Electrical Characteristics of Fluorescent Lamps, Instant Start and Cold Cathode Types (1978)
- (4) ANSI C82.2-1977 Methods of Measurement of Fluorescent Lamp Ballasts (1977)

Copies available from:
American National Standards Institute
1430 Broadway
New York, NY 10018

- (5) ANSI Z21.10.3-1984 Standard for Gas Water Heaters, Volume III, Circulating Tank, Instantaneous and Large Automatic Water Heaters (1984).
- (6) ANSI Z21.11.1-1977 Standard for Gas-Fired Vented Room Heaters (1977)
- (7) ANSI Z21.13-1982 Standard for Gas-Fired Low-Pressure Steam and Hot Water Boilers (1982)
- (8) ANSI Z83.8-1981 Standard for Gas-Fired Unit Heaters (1981)
- (9) ANSI Z83.9-1981 Standard for Gas-Fired Duct Heaters (1982)

Copies available from:
American Gas Association Laboratories
8501 East Pleasant Valley Road
Cleveland, OH 44131

(e) American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)

- (1) ANSI/ASHRAE 90A-1980 Energy Conservation in New Building Design (1980)
- (2) ANSI/ASHRAE 103-1982 Methods of Testing for Heating Seasonal Efficiency of Central Furnaces and Boilers (1982)
- (3) ANSI/ASHRAE 117-1986 Methods of Testing Self-Service Closed Refrigerators for Food Stores (1986)

Copies available from:
American Society of Heating, Refrigerating
and Air-Conditioning Engineers
1791 Tullie Circle NE
Atlanta, GA 30329

(f) Commercial Refrigerator Manufacturers Association (CRMA)

- (1) CRS-S1-86 Voluntary Minimum Standard for Retail Food Store Refrigerators (1986)

Copies available from:
Commercial Refrigerator Manufacturers Association
1101 Connecticut Avenue
Washington DC 20036

(g) National Sanitation Foundation (NSF)

- (1) Standard No. 1 Soda Fountain and Luncheonette Equipment (1984)
- (2) Standard No. 7 Food Service Refrigerators and Storage Freezers (1983)

Copies available from:
National Sanitation Foundation
3475 Plymouth Road
P.O. Box 1468
Ann Arbor, MI 48108

(h) Association of Home Appliance Manufacturers (AHAM)

- (1) ANSI/AHAM HRF-1-1979 Household Refrigerators, Combination Refrigerator-Freezers, and Household Freezers (1979)

Copies available from:
Association of Home Appliance Manufacturers
20 North Wacker Drive
Chicago, IL 60606

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