

Appendix B Excerpts from the Appliance Efficiency Regulations

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
B-2	Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps	B-5
B-3	Standards for Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps	B-6
C-2	Standards for Single Phase Air-Cooled Air Conditioners with Cooling Capacity Less than 65,000 Btu Per Hour and Single Phase Air-Source Heat Pumps with Cooling Capacity Less than 65,000 Btu Per Hour, Not Subject to EPAcT	B-7
C-3	Standards for Air-Cooled Air Conditioners and Air-Source Heat Pumps Subject to EPAcT	B-8
C-4	Standards for Evaporatively-Cooled Air Conditioners.....	B-8
C-5	Standards for Water-Cooled Air Conditioners and Water-Source Heat Pumps.....	B-9
C-7	Standards for Ground Water-Source and Ground-Source Heat Pumps	B-25
C-8	Standards for Air-Cooled Computer Room Air Conditioners	B-25
C-9	Standards for Water-Cooled, Glycol-Cooled, and Evaporatively-Cooled Computer Room Air Conditioners.....	B-26
C-10	Standards for Large Air-Cooled Packaged Air Conditioners	B-26
E-2	Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters.....	B-10

LIST OF TABLES (Continued)

<u>Table</u>	<u>Title</u>	<u>Page</u>
E-3	Standards for Gas- and Oil-Fired Central Boilers	B-11
E-4	Standards for Gas- and Oil-Fired Central Furnaces	B-11
E-5	Standards for Boilers.....	B-27
E-6	Standards for Furnaces	B-28
E-7	Standards for Duct Furnaces and Unit Heaters	B-28
F-2	Standards for Large Water Heaters (Effective January 1, 1994 through October 28, 2003).....	B-12
F-3	Standards for Large Water Heaters (New Standards Effective October 29, 2003).....	B-13
F-4	Standards for Large Water Heaters (Existing Standards Remaining in Effect On and After October 29, 2003).....	B-13
F-5	Standards for Small Water Heaters that are Not Federally-Regulated Consumer Products	B-30
H-1	Standards for Plumbing Fittings.....	B-15
H-2	Standards for Tub Spout Diverters	B-32
I	Standards for Plumbing Fixtures	B-16
J-1	Standards for Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp	Ballasts B-17
J-2	Standards for Fluorescent Lamp Ballasts	B-18
K-1	Standards for General Service Fluorescent Lamps	B-18
K-2	Standards for Incandescent Reflector Lamps	B-19
K-3	Standards for State-Regulated General Service Incandescent Lamps.....	B-33
L	Standards for Exit Signs.....	B-34
N-1	Standards for Metal Halide Luminaires	B-35

LIST OF TABLES (Continued)

<u>Table</u>	<u>Title</u>	<u>Page</u>
N-2	Standards for Under-Cabinet Luminaires	B-36
O	Standards for Dishwashers.....	B-20
P-2	Energy Efficiency Standards for Residential Clothes Washers	B-20
P-4	Standards for Commercial Clothes Washers	B-37
Q	Standards for Clothes Dryers.....	B-21
S	Standards for Electric Motors.....	B-22
T	Standards for Distribution Transformers.....	B-38

(This List of Tables is not part of the Regulations but is provided for the convenience of the reader.)

Note: For equipment that is covered by both §112 of the Building Energy Efficiency Standards and the Appliance Efficiency Regulations, the requirements of §112 supersede the requirements in the Appliance Efficiency Regulations

Note: Maximum energy consumption standards for refrigerator-freezers with internal freezers are same as those for refrigerator-freezers with top-mounted freezers.

- (2) See Section 1605.3(a) for energy efficiency and energy design standards for freezers with volume exceeding 30 ft³ that are consumer products, wine chillers that are consumer products, commercial refrigerators including but not limited to refrigerated bottled or canned beverage vending machines, commercial refrigerator-freezers, commercial freezers, commercial ice-makers, and water dispensers.

(b) Room Air Conditioners, Room Air-Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.

- (1) **Room Air Conditioners and Room Air-Conditioning Heat Pumps.** The EER of room air conditioners and room air-conditioning heat pumps that are manufactured on or after the effective dates shown shall be not less than the applicable values shown in Table B-2 in the Appliance Efficiency Regulations. The EER of room air conditioners and room air-conditioning heat pumps that are labeled for use at more than one voltage shall be not less than the applicable values shown in Table B-2 at each of the labeled voltages.

Table B-2
Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps

<i>Appliance</i>	<i>Louvered Sides</i>	<i>Cooling Capacity (Btu/hr)</i>	<i>Minimum EER</i>	
			<i>Effective January 1, 1990</i>	<i>Effective October 1, 2000</i>
Room Air Conditioner	Yes	< 6,000	8.0	9.7
Room Air Conditioner	Yes	≥ 6,000 – 7,999	8.5	9.7
Room Air Conditioner	Yes	≥ 8,000 – 13,999	9.0	9.8
Room Air Conditioner	Yes	≥ 14,000 – 19,999	8.8	9.7
Room Air Conditioner	Yes	≥ 20,000	8.2	8.5
Room Air Conditioner	No	< 6,000	8.0	9.0
Room Air Conditioner	No	≥ 6,000 – 7,999	8.5	9.0
Room Air Conditioner	No	≥ 8,000 – 19,999	8.5	8.5
Room Air Conditioner	No	≥ 20,000	8.2	8.5
Room Air Conditioning Heat Pump	Yes	< 20,000	8.5	9.0
Room Air Conditioning Heat Pump	Yes	≥ 20,000	8.5	8.5
Room Air Conditioning Heat Pump	No	< 14,000	8.0	8.5
Room Air Conditioning Heat Pump	No	≥ 14,000	8.0	8.0
Casement-Only Room Air Conditioner	Either	Any	*	8.7
Casement-Slider Room Air Conditioner	Either	Any	*	9.5

*Casement-only room air conditioners and casement-slider room air conditioners are not separate product classes under standards effective January 1, 1990. Such appliances, if manufactured before October 1, 2000, are subject to the applicable standards in Table B-2 for the other room air conditioners and room air-conditioning heat pumps based on capacity and the presence or absence of louvered sides.

- (2) **Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps.** The EER and COP, as applicable, of packaged terminal air conditioners and packaged terminal heat pumps shall be not less than the applicable values shown in Table B-3 in the Appliance Efficiency Regulations.

Table B-3
Standards for Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps

<i>Appliance</i>	<i>Mode</i>	<i>Cooling Capacity (Btu/hr)</i>	<i>Minimum EER or COP</i>
Packaged terminal air conditioners and packaged terminal heat pumps	Cooling	≤ 7,000	8.88 EER
		> 7,000 and < 15,000	10.0 – (0.00016 x Cap.) EER
		≥ 15,000	7.6 EER
Packaged terminal heat pumps	Heating	Any	1.3 + [0.16 (10.0 – 0.00016 x Cap.)] COP
Cap. = cooling capacity (Btu/hr)			

(c) **Central Air Conditioners.**

- (1) **Central Air Conditioners Other than Water-Source Heat Pumps Below 240,000 Btu/hr.**
 The EER, SEER, COP, and HSPF, as applicable, of all central air conditioners shall be not less than the applicable values shown in Tables C-2, C-3, C-4, and C-5.

Table C-2
Standards for Single Phase Air-Cooled Air Conditioners with
Cooling Capacity Less than 65,000 Btu per Hour and Single Phase Air-Source Heat Pumps with
Cooling Capacity Less than 65,000 Btu per Hour, Not Subject to EPart

<i>Appliance</i>	<i>Minimum Efficiency</i>			
	<i>Effective January 1, 1995</i>		<i>Effective January 23, 2006</i>	
	<i>Minimum SEER</i>	<i>Minimum HSPF</i>	<i>Minimum SEER</i>	<i>Minimum HSPF</i>
Split system air conditioners	10.0	—	13.0	—
Split system heat pumps	10.0	6.8	13.0	7.7
Single package air conditioners	9.7	—	13.0	—
Single package heat pumps	9.7	6.6	13.0	7.7
Space constrained air conditioners – split system	10.0	—	reserved	—
Space constrained heat pumps – split system	10.0	6.8	reserved	reserved
Space constrained air conditioners – single package	9.7	—	reserved	—
Space constrained heat pumps – single package	9.7	6.6	reserved	reserved

Table C-3
Standards for Air-Cooled Air Conditioners and
Air-Source Heat Pumps Subject to EPA Act

<i>Appliance</i>	<i>Cooling Capacity (Btu/hr)</i>	<i>System Type</i>	<i>Minimum Efficiency</i>
Air-cooled unitary air conditioners and heat pumps (cooling mode)	< 65,000 *	Split system	10.0 SEER
	< 65,000 *	Single package	9.7 SEER
	≥ 65,000 and < 135,000	All	8.9 EER
	≥ 135,000 and < 240,000	All	8.5 EER
Air-cooled unitary air-conditioning heat pumps (heating mode)	< 65,000 *	Split system	6.8 HSPF
	< 65,000 *	Single package	6.6 HSPF
	≥ 65,000 and < 135,000	All	3.0 COP at 47° F db
	≥ 135,000 and < 240,000	All	2.9 COP
* Three phase models only.			

Table C-4
Standards for Evaporatively-Cooled Air Conditioners

<i>Appliance</i>	<i>Cooling Capacity (Btu per hour)</i>	<i>Minimum EER</i>		
		<i>Effective January 1, 1994</i>	<i>Effective October 29, 2003</i>	<i>Effective October 29, 2004</i>
Evaporatively-cooled air conditioners	< 65,000	9.3	12.1	12.1
	≥ 65,000 and < 135,000	10.5	11.5 ¹	11.5 ¹
	≥ 135,000 < 240,000	9.6	9.6	11.0
¹ Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.				

Table C-5
Standards for Water-Cooled Air Conditioners and Water-Source Heat Pumps

<i>Appliance</i>	<i>Cooling Capacity (Btu per hour)</i>	<i>Minimum Efficiency</i>					
		<i>Effective January 1, 1995</i>		<i>Effective October 29, 2003</i>		<i>Effective October 29, 2004</i>	
		<i>Minimum EER</i>	<i>COP</i>	<i>Minimum EER</i>	<i>COP</i>	<i>Minimum EER</i>	<i>COP</i>
Water-cooled air conditioners	< 17,000	9.3	—	12.1	—	12.1	—
Water-source heat pumps	< 17,000	9.3	3.8	11.2	4.2	11.2	4.2
Water-cooled air conditioners	≥ 17,000 and < 65,000	9.3	—	12.1	—	12.1	—
Water-source heat pumps	≥ 17,000 and < 65,000	9.3	3.8	12.0	4.2	12.0	4.2
Water-cooled air conditioners	≥ 65,000 and < 135,000	10.5	—	11.5 ¹	—	11.5	—
Water-source heat pumps	≥ 65,000 and < 135,000	10.5	3.8	12.0	4.2	12.0	4.2
Water-cooled air conditioners	≥ 135,000 and < 240,000	9.6	—	9.6	—	11.0	—
Water-source heat pumps	≥ 135,000 and < 240,000	9.6	2.9	9.6	2.9	9.6	2.9

¹ Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.

- (2) **Gas-fired Air Conditioners and Heat Pumps.** There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.
- (3) **Other Central Air Conditioners.** See Sections 1605.2(c) and 1605.3(c) for energy efficiency standards for other central air conditioners.

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

There is no energy efficiency standard or energy design standard for spot air conditioners, evaporative coolers, ceiling fans, whole house fans, or residential exhaust fans.

(e) **Gas and Oil Space Heaters.**

- (1) **Gas Wall Furnaces, Gas Floor Furnaces, and Gas Room Heaters.** The AFUE of gas wall furnaces, gas floor furnaces, and gas room heaters shall be not less than the applicable values shown in Table E-2.

Table E-2
Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters

<i>Appliance</i>	<i>Design Type</i>	<i>Capacity (Btu per hour)</i>	<i>Minimum AFUE (%)</i>
Wall furnace	Fan	≤ 42,000	73
Wall furnace	Fan	> 42,000	74
Wall furnace	Gravity	≤ 10,000	59
Wall furnace	Gravity	> 10,000 ≤ 12,000	60
Wall furnace	Gravity	> 12,000 ≤ 15,000	61
Wall furnace	Gravity	> 15,000 ≤ 19,000	62
Wall furnace	Gravity	> 19,000 ≤ 27,000	63
Wall furnace	Gravity	> 27,000 ≤ 46,000	64
Wall furnace	Gravity	> 46,000	65
Floor furnace	All	≤ 37,000	56
Floor furnace	All	> 37,000	57
Room heater	All	≤ 18,000	57
Room heater	All	> 18,000 and ≤ 20,000	58
Room heater	All	> 20,000 and ≤ 27,000	63
Room heater	All	> 27,000 and ≤ 46,000	64
Room heater	All	> 46,000	65

- (2) **Central Gas Furnaces, Central Gas Boilers, Central Oil Furnaces, and Central Oil Boilers.** The AFUE, thermal efficiency, and combustion efficiency, as applicable, of central gas furnaces, central gas boilers, central oil furnaces, and central oil boilers shall be not less than the applicable values shown in Tables E-3 and E-4.

Table E-3
Standards for Gas- and Oil-Fired Central Boilers

<i>Appliance</i>	<i>Rated Input (Btu/hr)</i>	<i>Minimum Efficiency (%)</i>	
		<i>AFUE</i>	<i>Combustion Efficiency at Maximum Rated Capacity</i>
Gas steam boilers with single phase electrical supply	< 300,000	75	—
All other boilers with single phase electrical supply	< 300,000	80	—
Gas packaged boilers	≥ 300,000	—	80
Oil packaged boilers	≥ 300,000	—	83

Table E-4
Standards for Gas- and Oil-Fired Central Furnaces

<i>Appliance</i>	<i>Rated Input (Btu/hr)</i>	<i>Minimum Efficiency (%)</i>	
		<i>AFUE</i>	<i>Thermal Efficiency</i>
Mobile home gas and oil central furnaces with single phase electrical supply	< 225,000	75	—
All other gas and oil central furnaces with single phase electrical supply	< 225,000	78	—
Gas central furnaces	≥ 225,000	—	80
Oil central furnaces	≥ 225,000	—	81

- (3) **Infrared Gas Heaters.** There is no energy efficiency standard or energy design standard for infrared gas heaters.
- (4) **Other Gas and Oil Space Heaters.** See Section 1605.3(e) for standards for boilers, central furnaces, duct furnaces, and unit heaters that are not federally-regulated consumer products or federally-regulated commercial and industrial equipment.

(f) Water Heaters.

- (1) **Large Water Heaters.** The thermal efficiency and standby loss of large water heaters manufactured during the applicable time period shall be not less than the applicable values shown in Tables F-2, F-3, and F-4.

**Table F-2
Standards for Large Water Heaters
Effective October 29, 2003**

<i>Appliance</i>	<i>Category</i>	<i>Size or Rating</i>	<i>Minimum Thermal Efficiency (%)</i>	<i>Maximum Standby Loss^{1,2}</i>
Gas storage water heaters	< 4,000 Btu/hr/gal	< 155,000 Btu/hr	80	$Q/800 + 110\sqrt{V}$ Btu/hr
		> 155,000 Btu/hr	80	$Q/800 + 110\sqrt{V}$ Btu/hr
Gas instantaneous water heaters	$\geq 4,000$ Btu/hr/gal	≥ 10 gal	80	$Q/800 + 110\sqrt{V}$ Btu/hr
Oil storage water heaters	< 4,000 Btu/hr/gal	< 155,000 Btu/hr	78	$Q/800 + 110\sqrt{V}$ Btu/hr
		> 155,000 Btu/hr	78	$Q/800 + 110\sqrt{V}$ Btu/hr
Oil instantaneous water heaters	$\geq 4,000$ Btu/hr/gal	< 10 gal	80	–
		≥ 10 gal	78	$Q/800 + 110\sqrt{V}$ Btu/hr
Gas hot water supply boilers	$\geq 4,000$ Btu/hr/gal	≥ 10 gal	80	$Q/800 + 110\sqrt{V}$ Btu/hr
Oil hot water supply boilers	$\geq 4,000$ Btu/hr/gal	≥ 10 gal	78	$Q/800 + 110\sqrt{V}$ Btu/hr
<p>¹ Standby loss is based on a 70° F temperature difference between stored water and ambient requirements. In the standby loss equations, V is the rated volume in gallons, and Q is the nameplate input rate in Btu/hr.</p> <p>² Water heaters and hot water supply boilers having more than 140 gallons of storage capacity are not required to meet the standby loss requirement if the tank surface is thermally insulated to R-12.5, if a standing pilot light is not installed, and for gas- or oil-fired storage water heaters, there is a flue damper or fan-assisted combustion.</p>				

Table F-3
Standards for Large Water Heaters
(Effective January 1, 1994)

<i>Fuel</i>	<i>Input Rating</i>	<i>Volume (gallons)</i>	<i>Input to Volume Ratio (Btu/gal)</i>	<i>Minimum Thermal Efficiency (%)</i>	<i>Maximum Standby Loss (%/hour)^{1,2}</i>
Gas	> 200,000 (Btu/hour)	< 10	≥ 4,000	80	Not applicable
Electric	> 12 kW	≤ 140	< 4,000	Not applicable	0.3 + 27/V
Electric	> 12 kW	> 140	< 4,000	Not applicable	0.3 + 27/V
Electric	> 12 kW	< 10	≥ 4,000	80	Not applicable
Electric	> 12 kW	≥ 10	≥ 4,000	77	2.3 + 67/V

¹ Volume (V) = measured storage volume in gallons
² Storage-type water heaters with volume exceeding 140 gallons need not meet the standby loss requirement if they are thermally-insulated to at least R-12.5 and if a standing pilot light is not used.

- (2) **Small Water Heaters.** The energy factor of all small water heaters that are federally-regulated consumer products, (other than booster water heaters, hot water dispensers, and mini-tank electric water heaters) shall be not less than the applicable values shown in Table F-4.

Table F-4
Standards for Small Federally-Regulated Water Heaters

<i>Appliance</i>	<i>Minimum Energy Factor</i>	
	<i>Effective April 15, 1991</i>	<i>Effective January 20, 2004</i>
Gas-fired storage-type water heaters	0.62 - (.0019 x V)	0.67 - (.0019 x V)
Oil-fired water heaters (storage and instantaneous)	0.59 - (.0019 x V)	0.59 - (.0019 x V)
Electric storage water heaters (excluding tabletop water heaters)	0.93 - (.00132 x V)	0.97 - (.00132 x V)
Electric tabletop water heaters	0.93 - (.00132 x V)	0.93 - (.00132 x V)
Gas-fired instantaneous water heaters	0.62 - (.0019 x V)	0.62 - (.0019 x V)
Electric instantaneous water heaters (excluding tabletop water heaters)	0.93 - (.00132 x V)	0.93 - (.00132 x V)
Heat pump water heaters	0.93 - (.00132 x V)	0.97 - (.00132 x V)

V = rated volume in gallons.

-
- (3) **Booster Water Heaters.** There is no energy efficiency standard or energy design standard for booster water heaters.
 - (4) **Other Water Heaters.** See Section 1605.3(f) for standards for other water heaters.
 - (5) **Combination Space-Heating and Water-Heating Appliances.** See Section 1605.3(e) for standards for combination space-heating and water-heating appliances.
- (g) **Pool Heaters, Residential Pool Pumps, and Portable Electric Spas.**
- (1) **Energy Efficiency Standard for Gas-Fired Pool Heaters and Oil-Fired Pool Heaters.** The thermal efficiency of gas-fired pool heaters and oil-fired pool heaters shall be not less than 78 percent.
 - (2) **Energy Efficiency Standards for Heat Pump Pool Heaters.** See Section 1605.3(g) for energy efficiency standards for heat pump pool heaters.
 - (3) **Energy Efficiency Standard for Electric Resistance Pool Heaters.** There is no energy efficiency standard for electric resistance pool heaters.
 - (4) **Energy Design Standards for Pool Heaters.** See Section 1605.3(g) for energy design standards for pool heaters.
 - (5) **Energy Efficiency Standards for Portable Electric Spas.** See Section 1605.3(g) for energy efficiency standards for portable electric spas.
 - (6) **Energy Efficiency Standards and Energy Design Standards for Residential Pool Pumps.** See Section 1605.3(g) for energy efficiency standards and energy design standards for residential pool pumps.
- (h) **Plumbing Fittings.**
- (1) **Plumbing Fittings Except Tub Spout Diverters and Commercial Pre-rinse Spray Valves.** The flow rate of showerheads, lavatory faucets, kitchen faucets, lavatory replacement aerators, kitchen replacement aerators, wash fountains, and metering faucets shall be not greater than the applicable values shown in Table H-1. Showerheads shall also meet the requirements of ASME/ANSI Standard A112.18.1M-1996, 7.4.4(a).

**Table H-1
Standards for Plumbing Fittings**

<i>Appliance</i>	<i>Maximum Flow Rate</i>
Showerheads	2.5 gpm at 80 psi
Lavatory faucets	2.2 gpm at 60 psi
Kitchen faucets	2.2 gpm at 60 psi
Replacement aerators	2.2 gpm at 60 psi
Wash fountains	$2.2 \times \frac{\text{rim space (inches)}}{20}$ gpm at 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	$0.25 \times \frac{\text{rim space (inches)}}{20}$ gpm at 60 psi

- (2) **Showerhead-Tub Spout Diverter Combinations.** Showerhead-tub spout diverter combinations shall meet both the standard for showerheads and the standard for tub spout diverters.
- (3) **Tub Spout Diverters.** See Section 1605.3(h) for standards for tub spout diverters.
- (4) **Commercial Pre-rinse Spray Valves.** See Section 1605.3(h) for standards for commercial pre-rinse spray valves.

(i) **Plumbing Fixtures.**

The water consumption of water closets and urinals shall be not greater than the values shown in Table I.

**Table I
Standards for Plumbing Fixtures**

<i>Appliance</i>	<i>Maximum Gallons per Flush</i>
Gravity tank-type water closets	1.6
Flushometer tank water closets	1.6
Electromechanical hydraulic water closets	1.6
Blowout water closets	3.5
Trough-type urinals	<u>trough length (inches)</u> 16
Other urinals	1.0

(j) **Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp Ballasts.**

- (1) The ballast efficacy factor of the following types of fluorescent lamp ballasts shall be not less than the applicable values shown in Table J-1, except that fluorescent lamp ballasts (i) designed for dimming, (ii) designed for use in ambient temperatures of 0° F or less, or (iii) with a power factor of less than 0.90 and designed for use only in residential buildings are excluded:
- (A) replacement fluorescent lamp ballasts manufactured on or before June 30, 2010;
 - (B) fluorescent lamp ballasts manufactured on or after January 1, 1990;
 - (C) fluorescent lamp ballasts sold by the manufacturer on or after April 1, 1990; and
 - (D) fluorescent lamp ballasts incorporated into a luminaire by a luminaire manufacturer on or after April 1, 1991.

Table J-1
Standards for Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp Ballasts

<i>Application for Operation of</i>	<i>Ballast Input Voltage</i>	<i>Total Nominal Lamp Watts</i>	<i>Minimum Ballast Efficacy Factor</i>
one F40T12 lamp	120 or 277	40	1.805
two F40T12 lamps	120	80	1.060
	277	80	1.050
two F96T12 lamps	120 or 277	150	0.570
two F96T12HO lamps	120 or 277	220	0.390

- (2) The ballast efficacy factor of the following types of fluorescent lamp ballasts shall be not less than the applicable values shown in Table J-2, except that fluorescent lamp ballasts (i) designed for dimming to 50 percent or less of maximum output, (ii) designed for use with two F96T12HO lamps at ambient temperatures of -20° F or less and for use in an outdoor sign, (iii) with a power factor of less than 0.90 and designed and labeled for use only in residential buildings, or (iv) designated as a replacement ballast as defined in Section 1602(j) are excluded:
- (A) fluorescent lamp ballasts manufactured on or after April 1, 2005;
 - (B) fluorescent lamp ballasts sold by the manufacturer on or after July 1, 2005;
 - (C) replacement fluorescent lamp ballasts manufactured after June 30, 2010; and
 - (D) fluorescent lamp ballasts incorporated into a luminaire by a luminaire manufacturer on or after April 1, 2006.

Table J-2
Standards for Fluorescent Lamp Ballasts

<i>Application for Operation of</i>	<i>Ballast Input Voltage</i>	<i>Total Nominal Lamp Watts</i>	<i>Minimum Ballast Efficacy Factor</i>
one F40T12 lamp	120 or 277	40	2.29
two F40T12 lamps	120 or 277	80	1.17
two F96T12 lamps	120 or 277	150	0.63
two F96T12HO lamps	120 or 277	220	0.39

- (3) All fluorescent lamp ballasts covered by paragraphs (1) or (2) except replacement fluorescent lamp ballasts, shall have a power factor of 0.90 or greater.
- (4) There are no energy efficiency standards or energy design standards for ballasts designed to operate T5 lamps, T8 lamps, three T12 lamps, or four T12 lamps.

(k) **Lamps.**

- (1) **General Service Fluorescent Lamps That Are Federally-Regulated Appliances.** The average lamp efficacy and the color rendering index of general service fluorescent lamps shall be not less than the applicable values shown in Table K-1.

Table K-1
Standards for Federally-Regulated General Service Fluorescent Lamps

<i>Appliance</i>	<i>Nominal Lamp Wattage</i>	<i>Minimum Color Rendering Index (CRI)</i>	<i>Minimum Average Lamp Efficacy (LPW)</i>
4-foot medium bi-pin lamps	> 35	69	75.0
	≤ 35	45	75.0
2-foot U-shaped lamps	> 35	69	68.0
	≤ 35	45	64.0
8-foot slimline lamps	> 65	69	80.0
	≤ 65	45	80.0
8-foot high output lamps	> 100	69	80.0
	≤ 100	45	80.0

- (2) **Incandescent Reflector Lamps That Are Federally-Regulated Appliances.** The average lamp efficacy of incandescent reflector lamps shall be not less than the applicable values shown in Table K-2.

Table K-2

Standards for Federally-Regulated Incandescent Reflector Lamps

Nominal Lamp Wattage	Minimum Average Lamp Efficacy (LPW)
40-50	10.5
51-66	11.0
67-85	12.5
86-115	14.0
116-155	14.5
156-205	15.0

(3) See Section 1605.3(k) for energy efficiency standards for state-regulated general service incandescent lamps..

(l) **Emergency Lighting.**

See Section 1605.3(l) for energy efficiency standards for illuminated exit signs.

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

See Section 1605.3(m) for energy efficiency standards for traffic signal modules and traffic signal lamps.

(n) **Luminaires.**

See Section 1605.3(n) for energy efficiency standards and energy design standards for luminaires.

(o) **Dishwashers.**

The energy factor of dishwashers that are consumer products shall be not less than the applicable values shown in Table O.

Table O
Standards for Dishwashers

<i>Appliance</i>	<i>Minimum Energy Factor (cycles/kWh)</i>
Compact dishwashers	0.62
Standard dishwashers	0.46

(p) **Clothes Washers.**

- (1) **Energy Efficiency Standards for Residential Clothes Washers.** The energy factor and modified energy factor of clothes washers that are consumer products shall be not less than the applicable values shown in Table P-2.

Table P-2
Energy Efficiency Standards for Residential Clothes Washers

<i>Appliance</i>	<i>Minimum Energy Factor [ft³/(kWh/cycle)] Effective May 14, 1994 Through December 31, 2003</i>	<i>Minimum Modified Energy Factor [ft³/(kWh/cycle)]*</i>	
		<i>Effective January 1, 2004</i>	<i>Effective January 1, 2007</i>
Top-loading compact clothes washers	0.90	0.65	0.65
Top-loading standard clothes washers	1.18	1.04	1.26
Top-loading, semi-automatic	N/A ¹	N/A ¹	N/A ¹
Front-loading clothes washers	N/A ¹	1.04	1.26
Suds-saving	N/A ¹	N/A ¹	N/A ¹
¹ Must have an unheated rinse water option.			
*The sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load.			

- (2) **Energy Design Standard for Top-Loading Semi-Automatic Clothes Washers and Suds-Saving Clothes Washers.** Top-loading semi-automatic clothes washers that are consumer products and suds-saving clothes washers that are consumer products shall have an unheated rinse water option and do not need to meet the Modified Energy Factor standard shown in Table P-2.
- (3) **Energy Design Standard for Front-Loading Clothes Washers.** Until December 31, 2003, front-loading clothes washers that are consumer products shall have an unheated rinse water option.

- (4) **Water Efficiency Standards for Clothes Washers.** See Sections 1605.2(p) and 1605.3(p) for water efficiency standards for clothes washers.
- (5) **Clothes Washers that are Not Consumer Products.** See Section 1605.3(p) for energy efficiency standards and energy design standards for clothes washers that are not consumer products.

(q) **Clothes Dryers.**

- (1) **Energy Efficiency Standards for Gas Clothes Dryers and Electric Clothes Dryers.** The energy factor of gas clothes dryers that are consumer products and electric clothes dryers that are consumer products shall be not less than the applicable values shown in Table Q.

Table Q
Standards for Clothes Dryers

<i>Appliance</i>	<i>Minimum Energy Factor (lbs/kWh)</i>
Electric, standard clothes dryers	3.01
Electric, compact, 120 volt clothes dryers	3.13
Electric, compact, 240 volt clothes dryers	2.90
Gas clothes dryers	2.67

- (2) **Energy Design Standard for Gas Clothes Dryers.** Gas clothes dryers that are consumer products shall not be equipped with a constant burning pilot.

(r) **Cooking Products and Food Service Equipment.**

- (1) **Energy Design Standard for Gas Cooking Products with an Electrical Supply Cord.** Gas cooking products that are consumer products and that are equipped with an electrical supply cord shall not be equipped with a constant burning pilot.
- (2) **Hot Food Holding Cabinets.** See Section 1605.3(r) for energy efficiency standards for commercial hot food holding cabinets.
- (3) **Other Cooking Products and Food Service Equipment.** There is no energy efficiency standard or energy design standard for other cooking products or for food service equipment.

(s) **Electric Motors.**

- (1) Except as provided in paragraph (2) of this subsection, the nominal full-load efficiency of all electric motors that are federally-regulated commercial and industrial equipment shall be not less than the applicable values shown in Table S.

Table S
Standards for Electric Motors

<i>Motor Horsepower</i>	<i>Minimum Nominal Full-Load Efficiency</i>					
	<i>Open Motors</i>			<i>Closed Motors</i>		
	<i>6 poles</i>	<i>4 poles</i>	<i>2 poles</i>	<i>6 poles</i>	<i>4 poles</i>	<i>2 poles</i>
≥1 <1.5	80.0	82.5	...	80.0	82.5	75.5
≥1.5 <2	84.0	84.0	82.5	85.5	84.0	82.5
≥2 <3	85.5	84.0	84.0	86.5	84.0	84.0
≥3 <5	86.5	86.5	84.0	87.5	87.5	85.5
≥5 <7.5	87.5	87.5	85.5	87.5	87.5	87.5
≥7.5 <10	88.5	88.5	87.5	89.5	89.5	88.5
≥10 <15	90.2	89.5	88.5	89.5	89.5	89.5
≥15 <20	90.2	91.0	89.5	90.2	91.0	90.2
≥20 <25	91.0	91.0	90.2	90.2	91.0	90.2
≥25 <30	91.7	91.7	91.0	91.7	92.4	91.0
≥30 <40	92.4	92.4	91.0	91.7	92.4	91.0
≥40 <50	93.0	93.0	91.7	93.0	93.0	91.7
≥50 <60	93.0	93.0	92.4	93.0	93.0	92.4
≥60 <75	93.6	93.6	93.0	93.6	93.6	93.0
≥75 <100	93.6	94.1	93.0	93.6	94.1	93.0
≥100 <125	94.1	94.1	93.0	94.1	94.5	93.6
≥125 <150	94.1	94.5	93.6	94.1	94.5	94.5
≥150 <200	94.5	95.0	93.6	95.0	95.0	94.5
200	94.5	95.0	94.5	95.0	95.0	95.0

(2) The standards in this subsection do not apply to electric motors that are (A) installed and sold within another appliance that is within the scope of this Article or (B) installed in low-rise residential buildings.

(t) **Distribution Transformers.**

See Section 1605.3(t) for energy efficiency standards for distribution transformers.

(u) **Power Supplies and Consumer Audio and Video Equipment.**

See Section 1605.3(u) for energy efficiency standards for power supplies and consumer audio and video equipment.

The following documents are incorporated by reference in Section 1605.1

ASME/ANSI A112.8.1M-1996 Plumbing Fixture Fittings

Copies available from:

ASME International
Three Park Avenue
New York, NY 10016-5990
www.asme.org
Phone: (800) THE-ASME (U.S./Canada)
95-800-843-2763 (Mexico)
(973) 882-1167 (Outside North America)

NOTE: Authority cited: Sections 25213, 25218(e), 25402(a)-(c), 25553(b) and 25960, Public Resources Code.

Reference: Sections 25216.5(d), 25402(a)-(c), 25553(b) and 25960, Public Resources Code.

(b) **Room Air Conditioners, Room Air-Conditioning Heat Pumps, Packaged Terminal Air Conditioners, and Packaged Terminal Heat Pumps.**

See Section 1605.1(b) for energy efficiency standards for room air conditioners, room air conditioning heat pumps, packaged terminal air conditioners, and packaged terminal heat pumps that are federally-regulated consumer products or federally-regulated commercial and industrial equipment.

(c) **Central Air Conditioners.**

- (1) **Energy Efficiency Standards for Ground Water-Source Heat Pumps, and Ground-Source Heat Pumps.** The EER and COP for ground water-source heat pumps and ground-source heat pumps manufactured on or after October 29, 2003, shall be not less than the applicable values shown in Tables C-7.

Table C-7
Standards for Ground Water-Source and Ground-Source Heat Pumps

<i>Appliance</i>	<i>Rating Condition</i>	<i>Minimum Standard</i>
Ground water-source heat pumps (cooling)	59° F entering water temperature	16.2 EER
Ground water-source heat pumps (heating)	50° F entering water temperature	3.6 COP
Ground-source heat pumps (cooling)	77° F entering brine temperature	13.4 EER
Ground-source heat pumps (heating)	32° F entering brine temperature	3.1 COP

- (2) **Energy Efficiency Standards for Computer Room Air Conditioners.** The EER of air-cooled, water-cooled, glycol-cooled, and evaporatively-cooled computer room air conditioners manufactured on or after the effective dates shown, shall be not less than the applicable values shown in Tables C-8 and C-9.

Table C-8
Standards for Air-Cooled Computer Room Air Conditioners

<i>Appliance</i>	<i>Cooling Capacity (Btu/hr)</i>	<i>Minimum EER (Btu/watt-hour)</i>			
		<i>Effective January 1, 1998</i>	<i>Effective March 1, 2003</i>	<i>Effective January 1, 2004</i>	<i>Effective January 1, 2006</i>
Air-cooled computer room air conditioners	< 65,000	8.3	9.3	10.7	11.0
	≥ 65,000 and < 135,000	7.7	8.3	10.4	10.4
	≥ 135,000 and < 240,000	—	7.9	10.2	10.2

Table C-9
Standards for Water-Cooled, Glycol-Cooled, and Evaporatively-Cooled
Computer Room Air Conditioners

Appliance	Cooling Capacity (Btu/hr)	Minimum EER (Btu/watt-hour)			
		Effective January 1, 1998	Effective March 1, 2003	Effective October 29, 2004	Effective October 29, 2006
Water-cooled, glycol-cooled, and evaporatively-cooled computer room air conditioners	< 65,000	8.1	8.3	11.1	11.1
	≥ 65,000 and < 135,000	8.4	9.5	10.5	10.5
	≥ 135,000 and < 240,000	—	8.6	8.6	10.0

- (3) **Energy Efficiency Standards for Large Air-Cooled Unitary Air Conditioners.** The EER of air-cooled unitary air conditioners manufactured on or after on or after the effective dates shown, shall be not less than the applicable values shown in Table C-10.

Table C-10
Standards for Large Air-Cooled Packaged Air Conditioners

Appliance	Cooling Capacity (Btu/hr)	Minimum Standards	
		Effective October 1, 2006	Effective January 1, 2010
Air-cooled unitary air conditioners	≥240,000 and < 760,000	10.0 EER	10.5 EER

- (4) **Gas-fired Air Conditioners and Heat Pumps.** There is no energy efficiency standard or energy design standard for gas-fired air conditioners or gas-fired heat pumps.
- (5) **Other Central Air Conditioners.** See Sections 1605.1(c) and 1605.2(c) for energy efficiency standards for central air conditioners that are federally-regulated consumer products or federally-regulated commercial and industrial equipment.

(d) Spot Air Conditioners, Evaporative Coolers, Ceiling Fans, Whole House Fans, and Residential Exhaust Fans.

There is no energy efficiency standard or energy design standard for spot air conditioners, evaporative coolers, ceiling fans, whole house fans, and residential exhaust fans.

(e) Gas and Oil Space Heaters.

(1) Boilers, Central Furnaces, Duct Furnaces, and Unit Heaters.

- (A) The efficiency of boilers, central furnaces, duct furnaces, and unit heaters shall be not less than, and the standby loss shall be not greater than, the applicable values shown in Tables E-5, E-6, and E-7.

**Table E-5
Standards for Boilers**

Appliance	Output (Btu/hr)	Standards		
		Minimum AFUE %	Minimum Combustion Efficiency % *	Maximum Standby Loss (watts)
Gas steam boilers with 3-phase electrical supply	< 300,000	75	—	—
All other boilers with 3-phase electrical supply	< 300,000	80	—	—
Natural gas, non- packaged boilers	≥ 300,000	—	80	147
LPG Non- packaged boilers	≥ 300,000	—	80	352
Oil, non-packaged boilers	≥ 300,000	—	83	—
*At both maximum and minimum rated capacity, as provided and allowed by the controls.				

**Table E-6
Standards for Furnaces**

<i>Appliance</i>	<i>Application</i>	<i>Minimum Efficiency %</i>
Central furnaces with 3-phase electrical supply < 225,000 Btu/hour	Mobile Home	75 AFUE
	All others	78 AFUE or 80 Thermal Efficiency (at manufacturer's option)

**Table E-7
Standards for Duct Furnaces and Unit Heaters**

<i>Appliance</i>	<i>Fuel</i>	<i>Standards</i>		
		<i>Minimum Thermal Efficiency %¹</i>		<i>Maximum Energy Consumption during standby (watts)</i>
		<i>At maximum rated capacity</i>	<i>At minimum rated capacity</i>	
Duct furnaces	Natural gas	80	75	10
Duct furnaces	LPG ²	80	75	147
Unit heaters	Natural gas	80	74	10
Unit heaters	LPG ²	80	74	147
Unit heaters	Oil	81	81	N/A

¹ As provided and allowed by the controls.
² Designed expressly for use with LPG.

- (B) Natural gas-fired unit heaters and duct furnaces manufactured on or after January 1, 2006, shall have either power venting or an automatic flue damper.
- (2) **Oil Wall Furnaces, Oil Floor Furnaces and Infrared Gas Space Heaters.** There are no energy efficiency standards or energy design standards for oil wall furnaces, oil floor furnaces, or infrared gas space heaters.
- (3) **Combination Space-Heating and Water-Heating Appliances.**
- (A) If part of a combination space-heating and water-heating appliance is a water heater, that part shall comply with the applicable water heater standards in Sections 1605.1(f) and 1605.3(f).
- (B) If part of a combination space-heating and water-heating appliance is a furnace, boiler, or other space heater, that part shall comply with the applicable furnace, boiler, or other space heater standards in Sections 1605.1(e) and 1605.3(e).
- (C) Water heaters that are federally-regulated appliances, and that are contained in combination space-heating and water-heating appliances that are federally-regulated appliances, are required only to meet the standard for the applicable type of water heater, and are not required to meet any standard for space heaters.

(4) **Other Gas and Oil Space Heaters.** See Section 1605.1(e) for standards for gas and oil space heaters that are federally-regulated.

(f) **Water Heaters.**

(1) **Hot Water Dispensers and Mini-Tank Electric Water Heaters.** The standby loss of hot water dispensers and mini-tank electric water heaters manufactured on or after March 1, 2003 shall be not greater than 35 watts.

EXCEPTION: This subsection does not apply to any water heater:

- (1) that is within the scope of 42 U.S.C. Sections 6292(a)(4) or 6311(1)(F),
- (2) that has a rated storage volume of less than 20 gallons, and
- (3) for which there is no federal test method applicable to that type of water heater.

(2) **Small Water Heaters that are Not Federally-Regulated Consumer Products.** The energy factor of small water heaters manufactured on or after March 1, 2003 that are not federally-regulated consumer products, other than hot water dispensers, booster water heaters, and mini-tank electric water heaters, shall be not less than the applicable values shown in Table F-5.

EXCEPTION: This subsection does not apply to any water heater

- (1) that is within the scope of 42 U.S.C. Sections 6292(a)(4) or 6311(1)(F),
- (2) that has a rated storage volume of less than 20 gallons, and
- (3) for which there is no federal test method applicable to that type of water heater.

**Table F-5
Standards for Small Water Heaters that are Not Federally-Regulated Consumer Products**

<i>Appliance</i>	<i>Energy Source</i>	<i>Input Rating</i>	<i>Rated Storage Volume (gallons)</i>	<i>Minimum Energy Factor¹</i>
Storage water heaters	Gas	≤ 75,000 Btu/hr	< 20	0.62 – (.0019 x V)
Storage water heaters	Gas	≤ 75,000 Btu/hr	> 100	0.62 – (.0019 x V)
Storage water heaters	Oil	≤ 105,000 Btu/hr	> 50	0.59 – (.0019 x V)
Storage water heaters	Electricity	≤ 12 kW	> 120	0.93 – (.00132 x V)
Instantaneous Water Heaters	Gas	≤ 50,000 Btu/hr	Any	0.62 – (.0019 x V)
Instantaneous Water Heaters	Gas	≤ 200,000 Btu/hr	≥ 2	0.62 – (.0019 x V)
Instantaneous Water Heaters	Oil	≤ 210,000 Btu/hr	Any	0.59 – (.0019 x V)
Instantaneous Water Heaters	Electricity	≤ 12 kW	Any	0.93 – (.00132 x V)
¹ Volume (V) = rated storage volume in gallons.				

- (3) **Energy Efficiency Standards for Combination Space-Heating and Water-Heating Appliances.** See Section 1605.3(e)(3) for standards for combination space-heating and water-heating appliances.
- (4) **Energy Efficiency Standards for Water Heaters.** See Section 1605.1(f) for standards for water heaters that are federally-regulated consumer products or federally-regulated commercial and industrial equipment.
- (5) **Energy Efficiency Standards for Booster Water Heaters.** There is no energy efficiency standard or energy design standard for booster water heaters.
- (g) **Pool Heaters, Residential Pool Pumps, and Portable Electric Spas.**
- (1) **Energy Design Standard for Natural Gas Pool Heaters.** Natural gas pool heaters shall not be equipped with constant burning pilots.
- (2) **Energy Design Standard for All Pool Heaters.** All pool heaters shall have a readily accessible on-off switch that is mounted on the outside of the heater and that allows shutting off the heater without adjusting the thermostat setting.

- (3) **Energy Efficiency Standard for Heat Pump Pool Heaters.** For heat pump pool heaters manufactured on or after March 1, 2003, the average of the coefficient of performance (COP) at Standard Temperature Rating and the coefficient of performance (COP) at Low Temperature Rating shall be not less than 3.5.
- (4) **Energy Efficiency Standards for Gas and Oil Pool Heaters.** See Section 1605.1(g) for energy efficiency standards for gas and oil pool heaters that are federally-regulated consumer products.
- (5) **Residential Pool Pumps.**
- (A) **Motor Efficiency.** Pool pump motors manufactured on or after January 1, 2006 may not be split-phase or capacitor start – induction run type.
- (B) **Two-Speed Capability.**
- (i) **Pump Motors.** Pool pump motors with a capacity of 1 HP or more which are manufactured on or after January 1, 2008, shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate.
- (ii) **Pump Controls.** Pool pump motor controls manufactured on or after January 1, 2008 shall have the capability of operating the pool pump at least two speeds. The default circulation speed shall be the lowest speed, with a high speed override capability being for a temporary period not to exceed one normal cycle.
- (6) **Portable Electric Spas.** The standby power of portable electric spas manufactured on or after January 1, 2006, shall be not greater than $5(V^{2/3})$ Watts where V = the total volume, in gallons.
- (h) **Plumbing Fittings.**
- (1) **Tub Spout Diverters.** The leakage rate of tub spout diverters shall be not greater than the applicable values shown in Table H-2.

Table H-2
Standards for Tub Spout Diverters

<i>Appliance</i>	<i>Testing Conditions</i>	<i>Maximum Leakage Rate</i>
		<i>Effective March 1, 2003</i>
Tub spout diverters	When new	0.01 gpm
	After 15,000 cycles of diverting	0.05 gpm

- (2) **Showerhead-Tub Spout Diverter Combinations.** Showerhead-tub spout diverter combinations shall meet both the standard for showerheads and the standard for tub spout diverters.
- (3) **Commercial Pre-rinse Spray Valves.**

- (A) The flow rate of commercial pre-rinse spray valves manufactured on or after January 1, 2006, shall be equal to or less than 1.6 gpm at 60 psi.
- (B) Commercial pre-rinse spray valves manufactured on or after January 1, 2006 shall be capable of cleaning 60 plates at an average time of not more than 30 seconds per plate.

(4) **Other Plumbing Fittings.** See Section 1605.1(h) for energy efficiency standards for plumbing fittings that are federally-regulated consumer products.

(i) **Plumbing Fixtures.**

See Section 1605.1(i) for energy efficiency standards for plumbing fixtures that are federally-regulated consumer products.

(j) **Fluorescent Lamp Ballasts.**

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

(k) **Lamps.**

(1) See Section 1605.1(k) for energy efficiency standards for federally-regulated general service fluorescent lamps that are federally-regulated incandescent reflector lamp.

(2) **Energy Efficiency Standards for State-Regulated General Service Incandescent Lamps.**

The lamp electrical power input of state-regulated general service incandescent lamps manufactured on or after the effective dates shown in Table K-3, shall be no greater than the applicable values shown in Table K-3.

**Table K-3
Standards for State-Regulated General Service Incandescent Lamps**

Frost or Clear		
	Maximum Power Use (watts)	
Lumens (L)	January 1, 2006	January 1, 2008
L < 340	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 21
340 ≤ L < 562	(0.0500 * Lumens) + 21	38
562 ≤ L < 610	(0.0500 * Lumens) + 21	(0.2400 * Lumens) – 97
610 ≤ L < 760	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
760 ≤ L < 950	(0.0500 * Lumens) + 21	57
950 ≤ L < 1013	(0.0500 * Lumens) + 21	(0.2000 * Lumens) – 133
1013 ≤ L < 1040	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
1040 ≤ L < 1300	(0.0500 * Lumens) + 21	71
1300 ≤ L < 1359	(0.0500 * Lumens) + 21	(0.2700 * Lumens) – 280
1359 ≤ L < 1520	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
1520 ≤ L < 1850	(0.0500 * Lumens) + 21	95
1850 ≤ L < 1900	(0.0500 * Lumens) + 21	(0.4200 * Lumens) - 682
L ≥ 1900	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 21
Soft White		
	Maximum Power Use (watts)	
Lumens (L)	January 1, 2006	January 1, 2008
L < 310	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 22.5
310 ≤ L < 514	(0.0500 * Lumens) + 22.5	38
514 ≤ L < 562	(0.0500 * Lumens) + 22.5	(0.2200 * Lumens) – 75
562 ≤ L < 730	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
730 ≤ L < 909	(0.0500 * Lumens) + 22.5	57
909 ≤ L < 963	(0.0500 * Lumens) + 22.5	(0.2200 * Lumens) – 143
963 ≤ L < 1010	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
1010 ≤ L < 1250	(0.0500 * Lumens) + 22.5	71
1250 ≤ L < 1310	(0.0500 * Lumens) + 22.5	(0.2500 * Lumens) – 241.5
1310 ≤ L < 1490	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
1490 ≤ L < 1800	(0.0500 * Lumens) + 22.5	95

Table K-3 (Continued)
Standards for State-Regulated General Service Incandescent Lamps

$1800 \leq L < 1850$	$(0.0500 * \text{Lumens}) + 22.5$	$(0.4000 * \text{Lumens}) - 625$
$L \geq 1850$	$(0.0500 * \text{Lumens}) + 22.5$	$(0.0500 * \text{Lumens}) + 22.5$

(l) **Emergency Lighting.**

Energy Standards for Illuminated Exit Signs. The input power, luminance contrast, minimum luminance, average luminance and maximum to minimum luminance ratio of illuminated exit signs manufactured on or after March 1, 2003 shall meet the requirements of Table L.

Table L
Standards for Exit Signs

<i>Standard</i>	<i>Requirement</i>
Input power	< 5 watts per face
Luminance contrast	> 0.8
Minimum luminance	>8.6 candelas/meter ² measured at normal (0°) and 45° viewing angles
Average luminance	> 15 candelas/meter ² measured at normal (0°) and 45° viewing angles
Maximum to minimum luminance ratio	< 20:1 measured at normal (0°) and 45° viewing angles

(n) **Luminaires.**

- (1) **Energy Efficiency Standard and Energy Design Standard for Torchieres.** Torchieres manufactured on or after March 1, 2003, shall not consume more than 190 watts and shall not be capable of operating with lamps that total more than 190 watts. Torchieres manufactured on or after January 1, 2006, shall not use more than 190 watts. A torchiere shall be deemed to use more than 190 watts if any commercially available lamp or combination of lamps can be inserted in its socket(s) and cause the torchiere to draw more than 190 watts when operated at full brightness.
- (2) **Energy Efficiency Standard for-Metal Halide Luminaires.** Metal halide luminaires, manufactured on or after the effective dates shown in Table N-1, shall meet the requirements shown in Table N-1.

**Table N-1
Standards for Metal Halide Luminaires**

Lamp Position	Lamp Rating	Effective Date	Requirements
Vertical (base-up)	150-500 Watts	Jan. 1, 2006	Luminaires shall not contain a probe-start metal halide ballast.
Vertical (base-down)	150-500 Watts	Jan. 1, 2008	Luminaires shall not contain a probe-start metal halide ballast.
All	150-500 Watts	Jan. 1, 2008	Luminaires shall not contain a probe-start metal halide ballast.
All	150-500 Watts	Jan. 1, 2008	Luminaires wit metal halide lamps shall contain metal halide ballasts with a minimum ballast efficiency of 88 percent. Exceptions: <ol style="list-style-type: none"> 1. Luminaires that use electronic ballasts that operate at 480 volts; or 2. Luminaires that meet all of the following criteria: <ol style="list-style-type: none"> a. Rated only for 150 watt lamps; and b. Rated for use in wet locations as specified by the National Electrical Code 2002, Section 410.4(A); and c. Contain a ballast that is rated to operate at ambient air temperatures above 50 °C as specified by UL 1029-2001

Notes: Fixtures are covered if they are capable of operating lamps within the range of included lamp wattages. Vertical includes products rated only for use within 15° of vertical.

- (3) **Energy Efficiency Standards for Under-Cabinet Luminaires.** Under-cabinet luminaires that are equipped with T-8 fluorescent lamps and that are designed to be attached to office furniture and that are manufactured on or after January 1, 2006 shall be equipped with ballasts that have a ballast efficacy factor not less than the applicable values shown in Table N-2.

EXCEPTIONS:

1. Luminaires equipped with T-8 ballasts designed for dimming.
2. Luminaires that are:

(a) specifically and exclusively designed for use in applications where electromagnetic interference from electronic ballasts would interfere with critical, sensitive instrumentation and equipment such as medical imaging devices; and

(b) clearly, legibly, and permanently labeled, in at least 12 point type and in a place likely to be seen by the purchaser and the installer, "This fixture is intended exclusively for use in applications where critical, sensitive equipment would be adversely affected by electronic lamp ballast electromagnetic radiation".

Table N-2
Standards for Under-Cabinet Luminaires

<i>Lamp Length (inches)</i>	<i>Minimum Ballast Efficacy Factor (BEF) for one lamp</i>	<i>Minimum Ballast Efficacy Factor (BEF) for two lamps</i>
≤29	4.70	2.80
>29 and ≤35	3.95	2.30
>35 and ≤41	3.40	1.90
>41 and ≤47	3.05	1.65
>47	2.80	1.45

(o) **Dishwashers.**

See Section 1605.1(o) for energy efficiency standards for dishwashers that are federally-regulated consumer products.

(p) **Commercial Clothes Washers.**

- (1) **Energy and Water Efficiency Standards for Commercial Front-Loading and Commercial Top-Loading Automatic Clothes Washers.** The modified energy factor and water factor of commercial front-loading and commercial top-loading automatic clothes washers manufactured on or after the dates indicated in Table P-4 that are not consumer products shall be not less than (modified energy factor) and not more than (water factor) the applicable values shown in Table P-4.

Table P-4
Standards for Commercial Clothes Washers

<i>Appliance</i>	<i>Clothes Container Compartment Capacity (ft³)</i>	<i>Minimum Modified Energy Factor Effective January 1, 2005</i>	<i>Maximum Water Factor Effective January 1, 2007</i>
Front-loading clothes washers	< 3.5 ft ³	1.26	9.5
Top-loading clothes washers	< 1.6 ft ³	0.65	9.5
	≥ 1.6 ft ³ and < 4.0 ft ³	1.26	9.5

- (2) **Energy Design Standard for Commercial Top-Loading Semi-Automatic Clothes Washers and Commercial Suds-Saving Clothes Washers.** Commercial top-loading semi-automatic clothes washers and commercial suds-saving clothes washers manufactured on or after January 1, 2005 shall have an unheated rinse water option.

- (3) **Other Clothes Washers.** See Sections 1605.1(p) and 1605.2(p) for energy efficiency standards and energy design standards for clothes washers that are federally-regulated consumer products.

(q) **Clothes Dryers.**

See Section 1605.1(q) for energy efficiency standards and energy design standards for clothes dryers that are federally-regulated consumer products.

(r) **Cooking Products and Food Service Equipment.**

(s)

- (1) **Energy Standards for Food Service Equipment.** There is no energy efficiency standard or energy design standard for food service equipment other than commercial hot food holding cabinets.
- (2) **Energy Efficiency Standards for Commercial Hot Food Holding Cabinets.** The idle energy rate of commercial hot food holding cabinets manufactured on or after January 1, 2006 shall be no greater than 40 Watts per cubic foot of measured interior volume.
- (3) **Cooking Products.** See Section 1605.1(r) for the energy design standard for cooking products that are federally-regulated consumer products.

(t) **Electric Motors.**

See Section 1605.1(s) for energy efficiency standards for electric motors that are federally-regulated commercial and industrial equipment.

- (u) **Distribution Transformers.** The efficiency of all low voltage dry-type distribution transformers when tested at 35 percent of the rated output power, manufactured on or after March 1, 2003 shall be not less than the applicable values shown in Table T.

Table T
Standards for Distribution Transformers

<i>Single Phase</i>		<i>Three Phase</i>	
<i>Rated Power Output kVa</i>	<i>Minimum Efficiency %</i>	<i>Rated Power Output kVa</i>	<i>Minimum Efficiency %</i>
≥ 15 < 25	97.7	≥ 15 < 30	97.0
≥ 25 < 37.5	98.0	≥ 30 < 45	97.5
≥ 37.5 < 50	98.2	≥ 45 < 75	97.7
≥ 50 < 75	98.3	≥ 75 < 112.5	98.0
≥ 75 < 100	98.5	≥ 112.5 < 150	98.2
≥ 100 < 167	98.6	≥ 150 < 225	98.3
≥ 167 < 250	98.7	≥ 225 < 300	98.5
≥ 250 < 333	98.8	≥ 300 < 500	98.6
333	98.9	≥ 500 < 750	98.7
—	—	≥ 750 < 1000	98.8
—	—	1000	98.9

