225 CMR 9.00: APPLIANCE ENERGY-EFFICIENCY STANDARDS, TESTING AND CERTIFICATION PROGRAM

Section

9.01: Statutory Authorization

M.G.L. c. 25B, §§ 5 through 10 require the Commissioner of Energy Resources to adopt procedures for testing the energy efficiency of appliances and lamps covered by 225 CMR 9.00 if such procedures are not covered by the state plumbing code, and to certify those in compliance with 225 CMR 9.00.

9.02: Definitions

Terms defined in 42 U.S.C. § 6291 and M.G.L. c. 25B, §2, which are also used in 225 CMR 9.00, shall have the same meaning as set forth in 42 U.S.C. § 6291 and M.G.L c. 25B, §2, unless said term is otherwise defined in 225 CMR 9.02.

ANSI, the American National Standards Institute.

Automatic Defrost, a defrost system in which the defrosting action for all refrigerated surfaces is initiated and terminated automatically.

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

Ballast Factor, the ratio of the relative light output of a ballast expressed as a per cent to the rate of energy consumption expressed in watts at the test conditions specified in M.G.L. c. 25B, § 6.

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

Central Furnace, a self-contained space heater designed to supply heated air through ducts of more than ten inches in length.

Chest Freezer, a freezer whose access door is at the top of the appliance.

Compensation, money or any other valuable thing, regardless of form, received or to be received by a person for services rendered.

Electricity Ratio (ER) the ratio of furnace electricity use to total furnace energy use. ER = (3.412*EAE)/(1000*EF + 3.412*EAE) where EAE and EF are defined in Title 10 of the code of federal regulations.

Energy Use, the quantity of energy directly consumed by a consumer product at point of use, determined in accordance with test procedures under 42 U.S.C. §6293.

Energy Efficiency, the ratio of the useful output of services from a consumer product to the energy use of such product, determined in accordance with test procedures under 42 U.S.C. § 6293.

Energy Conservation Standard, a performance standard which prescribes a minimum level of energy efficiency or a maximum quantity of energy use, or in the case of showereheads, faucets, water closets, and urinals, water use, for a covered product determined in accordance with tests procedures prescribed under 42 U.S.C. § 6293.

9.02: continued

High-intensity Discharge Lamp, a lamp in which light is produced by the passage of an electric current through a vapor or gas and in which the light-producing arc is stabilized by bulb wall temperature and the arc tube has a bulb wall loading in excess of three watts per square centimeter.

Manual Defrost, a defrost system in which the defrosting action for all refrigerated surfaces is initiated manually.

Medium Voltage Dry-type Distribution Transformer, a transformer that:

(a) has an input voltage of more than 600 volts but less than or equal to 34,500 volts;
(b) is air-cooled;
(c) does not use oil as a coolant; and
(d) is rated for operation at a frequency of 60 Hertz.

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

Metal Halide Lamp Fixture, a light fixture designed to be operated with a metal halide lamp and a ballast for a metal halide lamp.

Model, all units of a given type of covered product (or class thereof) manufactured by one manufacturer and:

(a) with respect to refrigerators, refrigerator-freezers and freezers, have the same primary energy source, have electrical characteristics that are essentially identical and do not have any differing physical or functional characteristics that affect energy consumption.

(b) with respect to water heaters, have the same primary energy source and, with the exception of immersed heating elements, do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Nominal Input Voltage, an input voltage within plus 5% or minus 5% of a specified value.

Nominal Lamp Watts, the wattage at which a lamp is designed to operate and for which it is therefore rated.

Partial Automatic Defrost, 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.

Probe-start Metal Halide Ballast, a ballast used to operate metal halide lamps which does not contain an igniter and which instead starts lamps by using a third starting electrode probe in the arc tube.

Relative Light Output, 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.

Residential Furnace or Boiler, a product which utilizes only single-phase electric current, or single-phase electric current or DC current in conjunction with natural gas, propane, or home heating oil, and which:

(a) is designed to be the principle heating source for the living space of a residence;

(b) is not contained within the same cabinet with a central air conditioner with a rated cooling capacity exceeding 65,000 Btu per hour;

(c) is an electric central furnace, electric boiler, forced-air central furnace, gravity central furnace or low-pressure steam or hot water boiler; and

(d) has a heat input rate of less than 300,000 Btu per hour for electric boilers and low-pressure steam or hot water boilers, and less than 225,000 Btu per hour for forced-air central furnaces, gravity central furnace and electric central furnaces.

9.02: continued

Single-voltage External AC to DC Power Supply, a device that:

(a) is designed to convert line voltage AC input into lower voltage DC output;

(b) is able to convert to only one DC output voltage at a time;

(c) is sold with, or intended to be used with, a separate end-use product that constitutes the primary power load;

(d) is contained within a separate physical enclosure from the end-use product;

(e) is connected to the end-use product via a removable or hard-wired male/female electrical connection, cable, cord or other wiring;

(f) does not have batteries or battery packs, including those that are removable, that physically attach directly to the power supply unit;

(g) does not have a battery chemistry or type selector switch and indicator light, or does not have a battery chemistry or type selector switch and a state of charge meter; and

(h) has a nameplate output power less than or equal to 250 watts.

State-regulated Incandescent Reflector Lamp, a lamp, not colored or designed for rough or vibration service applications, with an inner reflective coating on the outer bulb to direct the light, an E26 medium screw base, a rated voltage or voltage range that lies at least partially within 115 to 130 volts and that falls into either of the following categories: a bulged reflector, elliptical reflector, blown parabolic aluminized reflector or similar bulb shape with a diameter equal to or greater than 2.25 inches; or a reflector, parabolic aluminized reflector, bulged reflector or similar bulb shape with a diameter of 2.25 through 2.75 inches.

Transformer, a device consisting of two or more coils of insulated wire and that is designed to transfer alternating current by electromagnetic induction from one coil to another to change the original voltage or current value. This term does not include:

(a) devices with multiple voltage taps, with the highest voltage tap equaling at least 20% more than the lowest voltage tap; or

(b) devices, such as those commonly known as drive transformers, rectifier transformers, auto-transformers, uninterruptible power system transformers, impedance transformers, regulating transformers, sealed and non-ventilating transformers, machine tool transformers, welding transformers, grounding transformers or testing transformers, that are designed to be used in a special-purpose application and are unlikely to be used in general-purpose applications.

Upright Freezer, a freezer whose access door is at the front of the appliance.

9.03: Product Standards and Test Methods

(1) Product standards and test methods shall be as indicated in 225 CMR 9.03 for those appliances and lamps expressly addressed by the Commonwealth in 225 CMR 9.03. Those product standards and test methods not otherwise explicitly mandated by the Commonwealth shall be prescribed under 42 U.S.C. § 6295 and 10 C.F.R § 430 as of January 1, 2006 and shall be the minimum standards and methods to be used until such time as more stringent standards are enacted by the Commonwealth or Federal government and shall become a part of Appliance Testing and Certification Program guidelines issued from time to time by DOER.

(2) The manufacturer shall cause the testing of all new appliances and lamps to be sold for final retail sale in Massachusetts on or after January 1, 1988.

(3) Refrigerators, Refrigerator-Freezers and Freezers.

(a) The annual energy consumption of a refrigerator, refrigerator-freezer or freezer (excluding the following types: those designed to be used without doors; those which do not include a compressor and a condesor unit as an integral part of the cabinet assembly; refrigerator and refrigerator-freezers with total refrigerated volume exceeding 30 cubic feet; top-mounted refrigerator-freezers with total refrigerated volume less than 16.6 cubic feet; and freezers with total refrigerated volume exceeding 30 cubic feet) shall not exceed the values derived from the formulas in 42 U.S.C. § 6295.

9.03: continued

(b) Fresh food refrigerated volume, freezer refrigerated volume, total refrigerated volume, energy consumption and energy factor shall be determined using the test procedures for refrigerators and freezers in 10 CFR § 430.22 and § 430.23 (2006).

(c) When a refrigerator, refrigerator-freezer or freezer can be operated using either alternating current electricity or one or more other sources of primary power, the test shall be performed using alternating current electricity only.

(4) Water Heaters.

(a) The energy efficiency of all new electric, gas or oil water heaters shall meet or exceed the energy factor specified in 42 U.S.C. § 6295(e).

(b) The manufacturer shall cause the testing of samples of each model of oil, gas, or electric water heater, to be sold for final retail sale in Massachusetts on or after January 1, 1988, in accordance with test procedures in 10 C.F.R. § 430.23(e) and 10 C.F.R. § 430-B, app E.

(5) Showerheads.

(a) The maximum flow rate for all new showerheads shall not exceed the values specified in 42 U.S.C. § 6295(j).

(b) The manufacturer shall cause the testing of samples of each model of showerheads by a laboratory approved by the Commisioner. The method of testing shall be the federal standard pursuant to 42 U.S.C. § 6295(j) and the laboratory shall complete and submit a Laboratory Certification form available from the Commissioner.

(6) Fluorescent Ballasts. The product standard for fluorescent ballasts shall be the federal standard prescribed under 42 U.S.C. § 6295 g(5).

(7) General Service Fluorescent Lamps and Incandescent Reflector Lamps. The product standards for general service fluorescent lamps and incandescent reflector lamps shall meet or exceed the lamp efficacy and CRI standards specified in 42 U.S.C. § 6295(i).

(8) Medium Voltage Dry-type Distribution Transformers.

(a) Medium voltage dry-type transformers shall have efficiencies not less than the applicable values in the following table when tested at 50% of the rated output power and at 75°C. (Following table copies Table 4-2 of NEMA standard TP 1-2002, but adds 3/10 point for each value per the Massachusetts law. The NEMA standard is available on their website at: www.nema.org)

9.03: continued

Single Phase			Three phase		
Rated power output in kVa	Minimum efficiency %		Rated power output in kVa	Minimum efficiency %	
	≤60 kV BIL	>60 kV BIL		≤60 kV BIL	>60 kV BIL
≥ 15 <25	97.9	97.9	≥ 15 <30	97.1	97.1
≥ 25 <37.5	98.2	98.2	≥ 30 <45	97.6	97.6
≥ 37.5 <50	98.4	98.4	≥ 45 <75	97.9	97.9
≥ 50 <75	98.5	98.5	≥ 75 <112.5	98.2	98.2
≥ 75 <100	98.7	98.7	≥ 112.5 <150	98.4	98.4
≥ 100 <167	98.8	98.8	≥ 150 <225	98.5	98.5
≥ 167 <250	99.1	99	≥ 225 <300	98.7	98.7
≥ 250 <333	99.2	99.1	≥ 300 <500	99.1	98.8
≥ 333 <500	99.3	99.2	≥ 500 <750	99.1	99
≥ 500 <667	99.4	99.3	≥ 750 <1000	99.2	99.1
≥ 667 <833	99.5	99.3	≥ 1000 <1500	99.3	99.2
833	99.5	99.4	≥ 1500 <2000	99.4	99.3
			≥ 2000 <2500	99.5	99.3
			2500	99.5	99.4

kVa = kilovolt amperes
kV = kilovolts
BIL = basic impulse insulation level

(b) The manufacturer shall cause the testing of samples of medium-voltage dry-type distribution transformers to be sold for final retail sale in Massachusetts on or after January 1, 2008 in accordance with the National Electrical Manufacturers Association (NEMA) standard TP2-2005, *Standard Test Method for Measuring the Energy Consumption of Distribution Transformers*. This test method is available from NEMA at www.nema.org.

(9) Metal Halide Lamp Fixtures. Metal halide lamp fixtures designed to be operated with lamps rated greater than or equal to 150 watts but less than or equal to 500 watts shall not contain a probe-start metal halide ballast.

9.03: continued

(10) Residential Furnaces or Boilers.

(a) Residential furnaces or boilers shall meet or exceed the following Annual Fuel Utilization Efficiency (AFUE):

Product Type	Minimum Efficiency Level
Gas and propane furnaces	*90% AFUE
Oil furnaces	*83% AFUE
Gas and propane hot water boilers	*84% AFUE
Oil-fired hot water boilers	*84% AFUE
Gas and propane steam boilers	*82% AFUE
Oil-fired steam boilers	*82% AFUE

(b) The commissioner may adopt rules to exempt compliance with these furnace or boiler standards at any building, site or location where complying with said standards would be in conflict with any local zoning ordinance, building or plumbing code or other rule regarding installation and venting of boilers or furnaces.

(c) Residential furnace air handlers shall have an ER of 2% or less, except residential oil furnaces with a capacity of less than 94,000 Btu per hour shall have an ER of 2.3% or less.

(d) The manufacturer shall cause the testing of samples of each model of residential furnaces and boilers to be sold for final retail sale in Massachusetts in accordance with the federal test method contained in 10 CFR § 430, Subpart B, Appendix N. The test method includes the testing methods required for both elements of Massachusetts standards (*i.e.* minimum AFUE standards and maximum electricity ratio standard.)

(11) Single-voltage External AC to DC Power Supplies.

(a) Single-voltage external AC to DC power supplies shall meet the requirements in the following table copied from table U-1 of the April 2005 version of California's Title 20:

Nameplate output	Minimum Efficiency in Active Mode
< 1 watt	0.49 * Nameplate Output
> 1 watt and < or = 49 watts	0.09*Ln(Nameplate Output) + 0.49
> 49 watts	0.84
	Maximum Energy Consumption in No-Load Mode
< 10 watts	0.5 watts
> or = 10 watts and < or = 250 watts	0.75 watts
Where Ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in Watts	

(b) A single voltage external AC-to-DC power supply that is made available by a manufacturer directly to a consumer service or repair facility after and separate from the original sale of the product requiring the power supply as a service part or spare part shall not be required to meet the standards of 225 CMR 9.03(11) until January 1, 2013.

(c) The manufacturer shall cause the testing of samples of each model of single-voltage external AC to DC power supplies to be sold for final retail sale in Massachusetts on or after January 1, 2008 in accordance with the test methodology specified in the United States Environmental Protection Agency's *Energy Star Program Requirements for Single Voltage External AC-DC and AC-AC Power Supplies* as in effect on January 1, 2005 except that products do not have to be tested at 230 volts. This document is available from the U.S. EPA. Manufacturers can access this document at http://www. energystar. gov/indes.cfm?c=product_specs.pt_product_specs. Manufacturers can also review the underlying testing methodology, "Test Method for Calculating the Energy Efficiency of single-Voltage External AC-DC and AC-AC Power Supplies (August 11, 2004)" at http://www. energystar.gov/index.cfm?c=ext_power_supplies.power_supplies_consumers.

9.03: continued

(12) State-regulated Incandescent Reflector Lamps.

(a) State-regulated incandescent reflector lamps shall meet the minimum efficacies in the following table:

Nominal Lamp Wattage	Minimum average lamp efficacy (lumens per watt)
40 - 50	10.5
51 - 66	11
67 - 85	12.5
86 - 115	14
116 - 155	14.5
156 - 205	15

The following types of incandescent reflector lamps are exempt from 225 CMR 9.03(12):

1. lamps rated at 50 watts or less of the following types: BR30, ER30, BR40, and ER40;
2. lamps rated at 65 watts of the following types: BR30, BR40, and ER40; and
3. R20 lamps of 45 watts or less.

(b) The manufacturer shall cause the testing of each model of state-regulated incandescent reflector lamps to be sold for final retail sale in Massachusetts on or after January 1, 2008 in accordance with the federal test method found in 10 CFR § 430, Subpart B, Appendix R.

9.04: Certification

(1) No new appliance or lamp covered by M.G.L. c. 25B, § 3 may be sold, offered for sale or installed in Massachusetts after the dates designated for the respective products in M.G.L. c. 25B, § 5 which is not certified pursuant to 225 CMR 9.04(2).

(2) The manufacturer shall submit to the Commissioner or to another state or third-party as designated by the Commissioner in guidelines a certification statement listing all new appliance models and lamps covered by 225 CMR 9.00. The certification statement requirements shall be set forth in the guidelines.

(3) On or after January 1, 2008, no new medium voltage dry-type distribution transformer, single-voltage external AC to DC power supply or state-regulated incandescent reflector lamp may be sold or offered for sale in the state unless the efficiency of the new product meets or exceeds the efficiency standards set forth in 225 CMR 9.03.

(4) On or after January 1, 2009, no new metal halide lamp fixture may be sold or offered for sale in the commonwealth unless the efficiency of the product meets or exceeds the efficiency standards set forth in 225 CMR 9.03.

(5) In accordance with M.G.L. c. 25B, § 9, the commissioner, in consultation with the attorney general, shall determine if implementation of state standards for residential furnaces or boilers requires a waiver from federal preemption, and shall apply for such waivers if necessary. If the commissioner determines that a waiver from federal preemption is necessary for residential furnaces or boiler standards established by 225 CMR 9.03, the state standard shall go into effect at the earliest date permitted by federal law. If the commissioner determines that a waiver from federal preemption is not needed for residential furnaces or boilers, then such state standards shall go into effect on June 1, 2008.

(6) One year after the date upon which the sale or offering for sale of certain products is limited pursuant to the preceding clauses of 225 CMR 9.04, no new products may be installed for compensation in the state unless the efficiency of the new product meets or exceeds the efficiency standards set forth in 225 CMR 9.03 adopted pursuant to M.G.L. c. 25B, § 5.

(7) The commissioner may test products covered by M.G.L. c. 25B, § 3. If products so tested are found not to be in compliance with the minimum efficiency standards established under M.G.L. c. 25B, § 5, the commissioner shall:

9.04: continued

(a) charge the manufacturer of such product for the cost of product purchase and testing; and

(b) provide information to the public on products found not to be in compliance with the standards.

(8) In adopting test procedures for determining energy efficiency, the commissioner may consult with other appropriate department heads and may adopt updated test methods when new versions of test procedures become available.

9.05: Identification of Complying Appliances and Lamps

(1) Sufficient information shall be shown on the outside of the shipping carton for any appliance or lamp (and unit carton in the case of plumbing fittings) to permit the determination of whether the appliance or lamp complies with the requirements of 225 CMR 9.00. The appropriate measure of energy consumption or the model number as it has been certified may be used for this purpose and shall be deemed as providing sufficient information to determine compliance.

For medium-voltage dry-type transformers and residential furnaces and boilers, the label information to be shown shall be marked with the words “Meets MA efficiency standards”, using the two-letter identification for Massachusetts: MA.

For external power supplies, the label information to be shown shall employ the labeling regime as that described in the regulations of the State of California Energy Commission for appliance standards in California Code Regs Title 20, § 1607(9) (2006).

Additionally, the words "2.5 gpm max", the actual tested flow rate, or other conspicuous marking approved by the Commissioner, shall be marked on each showerhead 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.

(2) The Commissioner or his/her designee may require additional information if necessary to permit determination of compliance.

(3) The manufacturer's name or brand name shall appear on each appliance or lamp.

9.06: Enforcement

(1) Notwithstanding the provisions of 225 CMR 9.04, the Commissioner shall have authority to challenge the efficiency test results provided by the manufacturer and cause the appliance model or lamp to be retested.

(2) The Commissioner shall cause periodic inspections to be made of manufacturers, distributors or retailers of the new appliances covered by M.G.L. c. 25B, including appliances that have been or are to be installed by contractors or builders at building sites, in order to determine compliance with 225 CMR 9.00.

(3) Except as expressly provided in the guidelines, any test ordered by the Commissioner would involve one unit selected by the Commissioner or his/her designee.

(a) If the performance of the unit meets or exceeds the standard set forth in 225 CMR 9.00, no further action is necessary, and the Division of Energy Resources will pay the cost of testing.

(b) If the performance of the unit does not meet or exceed the standard set forth in 225 CMR 9.00, the manufacturer must pay the cost of testing and, if the certification for that model has been suspended, take whatever steps are necessary to recertify the appliance at an efficiency rating equal to or exceeding the applicable standard according to the process outlined in the guidelines.

9.06: continued

(4) The Commissioner shall cause investigations to be made of complaints received concerning violations of M.G.L. c. 25B. All such complaints shall identify the complainant by name and address and should be in writing. The results of each investigation shall be reported to the complainant and to the attorney general.

REGULATORY AUTHORITY

225 CMR 9.00: M.G.L. c. 25B, §§ 3 through 10; St. 1986, c. 489 and St. 2005, c. 139.

NON-TEXT PAGE