
SUBSTITUTE HOUSE BILL 1004

State of Washington 61st Legislature 2009 Regular Session

By House Technology, Energy & Communications (originally sponsored by Representatives Morris, Chase, Morrell, Upthegrove, Hudgins, and Moeller)

READ FIRST TIME 02/05/09.

1 AN ACT Relating to adding products to the energy efficiency code;
2 and amending RCW 19.260.030, 19.260.040, and 19.260.050.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 **Sec. 1.** RCW 19.260.030 and 2006 c 194 s 2 are each amended to read
5 as follows:

6 (1) This chapter applies to the following types of new products
7 sold, offered for sale, or installed in the state: (a) Automatic
8 commercial ice cube machines; (b) ~~((commercial clothes washers; (c)
9 commercial prerinse spray valves; (d))~~ commercial refrigerators and
10 freezers; ~~((e) metal halide lamp fixtures; (f) single voltage external
11 AC to DC power supplies; (g))~~ (c) state-regulated incandescent
12 reflector lamps; ((and (h) unit heaters)) (d) wine chillers for use by
13 an individual; (e) illumination of remote reach-in cabinets, cabinets
14 without doors, and wine chillers that are not consumer products; (f)
15 hot water dispensers and minitank electric water heaters; (g) bottle-
16 type water dispensers and point-of-use water dispensers; (h) pool
17 heaters, residential pool pumps, and portable electric spas; (i) tub
18 spout diverters; and (j) commercial hot food holding cabinets. This

1 chapter applies equally to products whether they are sold, offered for
 2 sale, or installed as a stand-alone product or as a component of
 3 another product.

4 (2) This chapter does not apply to (a) new products manufactured in
 5 the state and sold outside the state, (b) new products manufactured
 6 outside the state and sold at wholesale inside the state for final
 7 retail sale and installation outside the state, (c) products installed
 8 in mobile manufactured homes at the time of construction, or (d)
 9 products designed expressly for installation and use in recreational
 10 vehicles.

11 **Sec. 2.** RCW 19.260.040 and 2006 c 194 s 3 are each amended to read
 12 as follows:

13 The legislature establishes the following minimum efficiency
 14 standards for the types of new products set forth in RCW 19.260.030.

15 (1)(a) Automatic commercial ice cube machines must have daily
 16 energy use and daily water use no greater than the applicable values in
 17 the following table:

| Equipment type | Type of cooling | Harvest rate (lbs. ice/24 hrs.) | Maximum energy use (kWh/100 lbs.) | Maximum condenser water use (gallons/100 lbs. ice) |
|------------------------------------------------|-----------------|------------------------------------|-----------------------------------------|----------------------------------------------------------|
| Ice-making head | water | <500 | 7.80 - .0055H | 200 - .022H |
| | | >=500<1436 | 5.58 - .0011H | 200 - .022H |
| | | >=1436 | 4.0 | 200 - .022H |
| Ice-making head | air | 450 | 10.26 - .0086H | Not applicable |
| | | >=450 | 6.89 - .0011H | Not applicable |
| Remote condensing but not remote compressor | air | <1000 | 8.85 - .0038 | Not applicable |
| | | >=1000 | 5.10 | Not applicable |
| Remote condensing and remote compressor | air | <934 | 8.85 - .0038H | Not applicable |
| | | >=934 | 5.3 | Not applicable |
| Self-contained models | water | <200 | 11.40 - .0190H | 191 - .0315H |
| | | >=200 | 7.60 | 191 - .0315H |
| Self-contained models | air | <175 | 18.0 - .0469H | Not applicable |
| | | >=175 | 9.80 | Not applicable |

34 Where H= harvest rate in pounds per twenty-four hours which must be reported within 5% of the tested value.

35 "Maximum water use" applies only to water used for the condenser.

(b) For purposes of this section, automatic commercial ice cube machines shall be tested in accordance with ARI 810-2003 test method as published by the air-conditioning and refrigeration institute. Ice-making heads include all automatic commercial ice cube machines that are not split system ice makers or self-contained models as defined in ARI 810-2003.

~~(2) ((Commercial clothes washers must have a minimum modified energy factor of 1.26. For the purposes of this section, capacity and modified energy factor are defined and measured in accordance with the current federal test method for clothes washers as found at 10 C.F.R. Sec. 430.23.~~

~~(3) Commercial prerinse spray valves must have a flow rate equal to or less than 1.6 gallons per minute when measured in accordance with the American society for testing and materials' "Standard Test Method for Prerinse Spray Valves," ASTM F2324-03.~~

(4)) (a) Commercial refrigerators and freezers must meet the applicable requirements listed in the following table:

| Equipment Type | Doors | Maximum Daily Energy Consumption (kWh) |
|------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------|
| Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are refrigerators | Solid | $0.10V + 2.04$ |
| | Transparent | $0.12V + 3.34$ |
| Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are "pulldown" refrigerators | Transparent | $.126V + 3.51$ |
| Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are freezers | Solid | $0.40V + 1.38$ |
| | Transparent | $0.75V + 4.10$ |
| Reach-in cabinets that are refrigerator-freezers with an AV of 5.19 or higher | Solid | $0.27AV - 0.71$ |

kWh= kilowatt hours

V= total volume (ft³)

AV= adjusted volume= [1.63 x freezer volume (ft³)]+ refrigerator volume (ft³)

(b) For purposes of this section, "pulldown" designates products designed to take a fully stocked refrigerator with beverages at 90 degrees F and cool those beverages to a stable temperature of 38 degrees F within 12 hours or less. Daily energy consumption shall be

1 measured in accordance with the American national standards
 2 institute/American society of heating, refrigerating and air-
 3 conditioning engineers test method 117-2002, except that the back-
 4 loading doors of pass-through and roll-through refrigerators and
 5 freezers must remain closed throughout the test, and except that the
 6 controls of all appliances must be adjusted to obtain the following
 7 product temperatures.

| 8 Product or compartment type | Integrated average product temperature in degrees Fahrenheit |
|-------------------------------|--------------------------------------------------------------|
| 9 Refrigerator | 38±2 |
| 10 Freezer | 0±2 |

11 ~~((5) Metal halide lamp fixtures designed to be operated with lamps~~
 12 ~~rated greater than or equal to 150 watts but less than or equal to 500~~
 13 ~~watts shall not contain a probe start metal halide lamp ballast.~~

14 ~~(6)(a) Single voltage external AC to DC power supplies shall meet~~
 15 ~~the requirements in the following table:~~

| 16 Nameplate output | Minimum Efficiency in Active Mode |
|------------------------------------|--------------------------------------------|
| 17 <1 Watt | 0.49 * Nameplate Output |
| 18 >or=1 Watt and <or= 49 Watts | 0.09 * Ln (Nameplate Output) + 0.49 |
| 19 >49 Watts | 0.84 |
| | Maximum Energy Consumption in No-Load Mode |
| 21 <10 Watts | 0.5 Watts |
| 22 >or=10 Watts and <or= 250 Watts | 0.75 Watts |

23 ~~Where Ln (Nameplate Output) - Natural Logarithm of the nameplate output expressed in Watts~~
 24 ~~(b) For the purposes of this section, efficiency of single voltage~~
 25 ~~external AC to DC power supplies shall be measured in accordance with~~
 26 ~~the United States environmental protection agency's "Test Method for~~
 27 ~~Calculating the Energy Efficiency of Single Voltage External AC to DC~~
 28 ~~and AC to AC Power Supplies," by Ecos Consulting and Power Electronics~~
 29 ~~Application Center, dated August 11, 2004.~~

30 ~~(7)) (3)(a) The lamp electrical power input of state-regulated~~
 31 ~~incandescent reflector lamps shall meet the minimum average lamp~~
 32 ~~efficacy requirements for federally regulated incandescent reflector~~
 33 ~~lamps contained in 42 U.S.C. Sec. 6295(i)(1)(A)-(B).~~

1 (b) The following types of incandescent lamps are exempt from these
2 requirements:

3 (i) Lamps rated at fifty watts or less of the following types: BR
4 30, ER 30, BR 40, and ER 40;

5 (ii) Lamps rated at sixty-five watts of the following types: BR
6 30, BR 40, and ER 40; and

7 (iii) R 20 lamps of forty-five watts or less.

8 ~~((8) Unit heaters must be equipped with intermittent ignition
9 devices and must have either power venting or an automatic flue
10 damper.))~~

11 (4)(a) Wine chillers designed and sold for use by an individual
12 must not exceed the applicable requirements listed in the following
13 table:

| <u>Equipment Type</u> | <u>Maximum Annual Appliance Energy Consumption (kWh)</u> |
|---------------------------------------------|--------------------------------------------------------------|
| <u>Wine chillers with manual defrost</u> | <u>13.7V + 267</u> |
| <u>Wine chillers with automatic defrost</u> | <u>17.4V + 344</u> |

18
19 V = volume in ft³.

20 (b) Wine chillers shall be tested in accordance with the code of
21 federal regulations, section 430.23(a) (2005), with the following
22 modifications:

23 Standardized temperature as referred to in section 3.2 of appendix A1
24 shall be 55°F (12.8°C).

25 The calculation of test cycle energy expended (ET) in section 5.2.1.1
26 of appendix A1 shall be made using the modified formula:

27 $ET = (EP \times 1440 \times k) / T$

28 Where:

29 $k = 0.85$

30 (5) The internal illumination of the following appliances,
31 manufactured on or after January 1, 2010, shall be only by (a) T-8
32 fluorescent lamps with electronic ballasts, or (b) a lighting system
33 that has no fewer lumens per watt than a system using only T-8
34 fluorescent lamps with electronic ballasts:

1 (i) Remote reach-in cabinets with transparent doors, remote
2 pass-through cabinets with transparent doors, and remote roll-in or
3 roll-through cabinets with transparent doors;

4 (ii) Cabinets without doors; and

5 (iii) Wine chillers that are not consumer products.

6 (6)(a) The standby energy consumption of bottle-type water
7 dispensers, and point-of-use water dispensers, dispensing both hot and
8 cold water, manufactured on or after January 1, 2010, shall not exceed
9 1.2 kWh/day.

10 (b) The test method for water dispensers shall be the environmental
11 protection agency energy star program requirements for bottled water
12 coolers version 1.1.

13 (7)(a) The standby loss of hot water dispensers and minitank
14 electric water heaters manufactured on or after January 1, 2010, shall
15 be not greater than 35 watts.

16 (b) This subsection does not apply to any water heater:

17 (i) That is within the scope of 42 U.S.C. Sec. 6292(a)(4) or
18 6311(1)(F);

19 (ii) That has a rated storage volume of less than 20 gallons; and

20 (iii) For which there is no federal test method applicable to that
21 type of water heater.

22 (c) The test method for hot water dispensers is as follows:

23 (i) Connect the hot water dispenser to a water supply, a power
24 supply, and a means of measuring energy use. Fill the hot water
25 dispenser with water and apply the power supply. Control the ambient
26 temperature in the laboratory at 77°F ± 7°F throughout the test.

27 (ii) Let the unit operate in standby mode for at least two complete
28 cycles of thermostat operation, with the thermostat set to 150°F ± 10°F
29 as described in (c)(iii) of this subsection.

30 (iii) If the thermostat is adjustable, set it to produce water at
31 150°F ± 10°F, determined by discharging five oz. of water into an
32 insulated cup immediately after a thermostat cut out, then measuring
33 its temperature.

34 (iv) If the thermostat is adjustable, and the temperature is not
35 within the tolerance shown in (c)(ii) of this subsection, readjust the
36 thermostat and allow it to operate in standby mode for two cycles,
37 measuring the discharge temperature immediately after the second cut
38 out, as described in (c)(iii) of this subsection.

1 (v) After the thermostat has been properly adjusted, allow the unit
2 to operate in standby mode for a minimum of two cycles, then measure
3 the electricity used (in Wh) during the next twenty-four hours (plus
4 time for first cut out after twenty-four hours). Begin measuring
5 electricity usage immediately after a thermostat cut out, and end just
6 after the first thermostat cut out after twenty-four hours. The total
7 length of the test will be somewhat longer than twenty-four hours,
8 depending on the first cut out after twenty-four hours. Divide the
9 measured electricity used (in Wh) by the time (in hours), to obtain the
10 standby loss (in watts).

11 (vi) Record the water temperature measured in (c)(iv) of this
12 subsection and the standby loss calculated in (c)(v) of this
13 subsection.

14 (d) The test method for minitank electric water heaters is as
15 follows:

16 (i) Storage tank volume. Determine the storage capacity of the
17 water heater, in gallons, by subtracting the weight of the empty water
18 heater from the weight of the water heater when completely filled with
19 water (with all air eliminated and line pressure applied) and dividing
20 the resulting net weight by the density of water at the measured
21 temperature.

22 $V = \frac{W_f - W_t}{\rho}$

23 Where:

- 24 V = the storage capacity in gallons
- 25 W_f = the weight of the water heater when full (lb)
- 26 W_t = the weight of the empty water heater (lb)
- 27 ρ = the density of the water (lb/gal)

28 (ii) Test set-up

29 (A) Insulate the water piping, including heat traps, if provided by
30 the manufacturer, for a length of four feet from the connection to the
31 appliance with material having a thermal resistance I value of not less
32 than 4°F x ft² x hr/Btu. Ensure that the insulation does not contact
33 any water heater surface except at the location where the pipe
34 connections penetrate the appliance jacket.

35 (B) If the manufacturer has not provided a temperature and pressure
36 relief valve, one shall be installed and insulated.

1 (C) Maintain the temperature of the supply water at 70°F ± 2°F and
2 the pressure of the water supply between 40 psi and the maximum
3 pressure specified by the manufacturer. The accuracy of the pressure
4 measuring devices shall be within ± 1.0 pound per square inch. The
5 water heater shall be isolated by use of a shut off valve in the supply
6 line with an expansion tank installed in the supply line downstream of
7 the shut off valve. There shall be no shut off means between the
8 expansion tank and the appliance inlet.

9 (D) Before starting testing of the water heater, the setting of the
10 thermostat shall first be obtained by supplying the water in the system
11 at 70°F ± 2°F and then noting the maximum mean temperature of the water
12 after the thermostat shuts off the electric supply to be 142°F ± 8°F.

13 (E) For measuring the energy consumption, instrumentation shall be
14 installed which measures within ± 2 percent. Voltage shall be within
15 ± 10 percent of the rated voltage.

16 (F) Three or more temperature sensing means shall be installed
17 inside the storage tank on the vertical center of each of three or more
18 non overlapping sections of approximately equal volume from the top to
19 the bottom of the tank. Each temperature sensing means is to be
20 located as far as possible from any heat source or other irregularity,
21 anodic protective device, or water tank or flue wall. The anodic
22 protective device shall be removed in order to install the temperature
23 sensing means, and testing shall be carried out with the device
24 removed. If the temperature sensing means cannot be installed as
25 specified, placement of the temperature sensing means shall be made at
26 the discretion of the testing agency so that comparable water
27 temperature measurements are obtained. A temperature sensing means,
28 shielded against direct radiation and positioned at the vertical
29 midpoint of a tank type water heater at a perpendicular distance of
30 approximately twenty-four inches from the surface of the jacket, shall
31 be installed in the test room.

32 (G) The ambient air temperature of the test room shall be
33 maintained at 75°F ± 10°F. The ambient temperature shall not vary more
34 than ± 7.0°F from the average during the test, temperature readings
35 being taken at fifteen-minute intervals and averaged at the end of the
36 test.

37 (iii) Standby loss. Fill the water heater with water. Turn on the
38 electric power to the water heater. After the first cut out, allow the

1 water heater to remain in the standby mode until the next cut out. At
2 this time, record the time, ambient temperature, and begin measuring
3 the electric consumption. Record the maximum mean tank temperature
4 that occurs after cut out. Record the mean tank temperature and the
5 ambient air temperature at the end of the first fifteen-minute interval
6 and at the end of each subsequent fifteen-minute interval. The
7 duration of this test shall be until the first cut out that occurs
8 after twenty-four hours. Immediately after the conclusion of the test,
9 record the total electrical energy consumption, the final ambient air
10 temperature, and the time duration of the standby loss test (t) in
11 hours rounded to the nearest one hundredth of an hour and the maximum
12 mean tank temperature that occurs after cut out. Calculate the average
13 of the recorded values of the mean tank temperatures and of the ambient
14 air temperatures taken at the end of each time interval, including the
15 initial and final values. Determine the difference ($\Delta T3$) between these
16 two averages by subtracting the latter from the former, and the
17 differences ($\Delta T4$) between the final and initial mean tank temperatures
18 by subtracting the latter from the former.

19 Determine the standby loss (W) using the formula:

20 $W = S \times K \times V (\Delta T1) / (3412 \text{ Btu/kWh})$

21 Where:

22 $\Delta T1 = 70^\circ\text{F}$, the nominal difference between mean tank temperature and
23 the average ambient air temperature

24 S = standby loss, hr-1

25 K = 8.25 Btu per gallon $^\circ\text{F}$, the nominal specific heat of water

26 V = tank capacity expressed in gallons

27 3412 = conversion factor from kWh to Btu/hr

28 (8) The following standards are established for pool heaters,
29 residential pool pumps, and portable electric spas:

30 (a) Natural gas pool heaters shall not be equipped with constant
31 burning pilots.

32 (b) Pool pump motors shall meet the following standards:

33 (i) Pool pump motors manufactured on or after January 1, 2010, may
34 not be split-phase or capacitor start -- induction run type.

35 (ii) Pool pump motors with a capacity of 1 HP or more which are
36 manufactured on or after January 1, 2010, shall have the capability of

1 operating at two or more speeds with a low speed having a rotation rate
2 that is no more than one-half of the motor's maximum rotation rate.

3 (iii) Pool pump motor controls manufactured on or after January 1,
4 2010, shall have the capability of operating the pool pump at at least
5 two speeds. The default circulation speed shall be the lowest speed,
6 with a high speed override capability being for a temporary period not
7 to exceed one normal cycle.

8 (c) The standby power of portable electric spas manufactured on or
9 after January 1, 2010, shall be not greater than $5(V^{2/3})$ watts where V
10 = the total volume, in gallons.

11 (d) The test method for portable electric spas is as follows:

12 (i) Minimum continuous testing time shall be seventy-two hours.

13 (ii) The water temperature shall remain at or above the test
14 temperature of 102°F for the duration of the test.

15 (iii) The ambient air temperature shall remain at or below the test
16 temperature of 60°F for the duration of the test.

17 (iv) The standard cover that comes with the unit shall be used
18 during the test.

19 (v) The test shall start when the water temperature has been at
20 102°F for at least four hours.

21 (vi) Record the total energy use for the period of test, starting
22 at the end of the first heating cycle after the four-hour stabilization
23 period, and finishing at the end of the first heating cycle after
24 seventy-two hours has elapsed.

25 (vii) The unit shall remain covered and in the default operation
26 mode during the test. Energy conserving circulation functions, if
27 present, must not be enabled if not appropriate for continuous, long-
28 term use.

29 (viii) Data reported shall include: Spa identification (make,
30 model, S/N, specifications); volume of the unit in gallons; cover R-
31 value; supply voltage; average relative humidity during test; minimum,
32 maximum, and average water temperatures during test; minimum, maximum,
33 and average ambient air temperatures during test; date of test; length
34 of test (t, in hours); total energy use during the test (P, in Wh); and
35 standby power (P/t, in watts).

36 (9)(a) The leakage rate of tub spout diverters shall be no greater
37 than the applicable requirements shown in the following table:

| 1 | | | <u>Maximum Leakage Rate</u> |
|---|----------------------------|----------------------------------|----------------------------------|
| 2 | Appliance | Testing Conditions | <u>Effective January 1, 2009</u> |
| 3 | | <u>When new</u> | <u>0.01 gpm</u> |
| 4 | <u>Tub spout diverters</u> | After 15,000 cycles of diverting | <u>0.05 gpm</u> |

5 (b) Showerhead-tub spout diverter combinations shall meet both the
6 standard for showerheads and the standard for tub spout diverters.

7 (10)(a) The idle energy rate of commercial hot food holding
8 cabinets manufactured on or after January 1, 2010, shall be no greater
9 than 40 watts per cubic foot of measured interior volume.

10 (b) The idle energy rate of commercial hot food holding cabinets
11 shall be determined using ANSI/ASTM F2140-01 standard test method for
12 the performance of hot food holding cabinets (test for idle energy rate
13 dry test). Commercial hot food holding cabinet interior volume shall
14 be calculated using straight line segments following the gross interior
15 dimensions of the appliance and using the following equation: Interior
16 height x interior width x interior depth. Interior volume shall not
17 account for racks, air plenums, or other interior parts.

18 **Sec. 3.** RCW 19.260.050 and 2006 c 194 s 4 are each amended to read
19 as follows:

20 (1) No new (~~commercial prerinse spray valve, commercial clothes~~
21 ~~washer,~~) commercial refrigerator or freezer(~~(,)~~) or state-regulated
22 incandescent reflector lamp(~~(, or unit heater)~~) manufactured on or
23 after January 1, 2007, may be sold or offered for sale in the state
24 unless the efficiency of the new product meets or exceeds the
25 efficiency standards set forth in RCW 19.260.040. No new automatic
26 commercial ice cube machine(~~(, single voltage external AC to DC power~~
27 ~~supply, or metal halide lamp fixtures)~~) manufactured on or after
28 January 1, 2008, may be sold or offered for sale in the state unless
29 the efficiency of the new product meets or exceeds the efficiency
30 standards set forth in RCW 19.260.040.

31 (2) On or after January 1, 2008, no new (~~commercial prerinse spray~~
32 ~~valve, commercial clothes washer,~~) commercial refrigerator or
33 freezer(~~(, single voltage external AC to DC power supply,~~) or state-
34 regulated incandescent reflector lamp(~~(, or unit heater)~~) manufactured

1 on or after January 1, 2007, may be installed for compensation in the
2 state unless the efficiency of the new product meets or exceeds the
3 efficiency standards set forth in RCW 19.260.040. On or after January
4 1, 2009, no new automatic commercial ice cube machine (~~or metal halide~~
5 ~~lamp fixtures~~) manufactured on or after January 1, 2008, may be
6 installed for compensation in the state unless the efficiency of the
7 new product meets or exceeds the efficiency standards set forth in RCW
8 19.260.040.

9 (3) Standards for (~~metal halide lamp fixtures and~~) state-
10 regulated incandescent reflector lamps are effective on the dates in
11 subsections (1) and (2) of this section.

12 (4) The following products, if manufactured on or after January 1,
13 2010, may not be sold or offered in the state unless the efficiency of
14 the new product meets or exceeds the efficiency standards set forth in
15 RCW 19.260.040:

16 (a) Wine chillers for use by an individual;

17 (b) Illumination of remote reach-in cabinets, cabinets without
18 doors, and wine chillers that are not consumer products;

19 (c) Hot water dispensers and minitank electric water heaters;

20 (d) Bottle-type water dispensers and point-of-use water dispensers;

21 (e) Pool heaters, residential pool pumps, and portable electric
22 spas;

23 (f) Tub spout diverters; and

24 (g) Commercial hot food holding cabinets.

25 (5) The following products, if manufactured on or after January 1,
26 2010, may not be installed for compensation in the state on or after
27 January 1, 2011, unless the efficiency of the new product meets or
28 exceeds the efficiency standards set forth in RCW 19.260.040:

29 (a) Wine chillers for use by an individual;

30 (b) Illumination of remote reach-in cabinets, cabinets without
31 doors, and wine chillers that are not consumer products;

32 (c) Hot water dispensers and minitank electric water heaters;

33 (d) Bottle-type water dispensers and point-of-use water dispensers;

34 (e) Pool heaters, residential pool pumps, and portable electric
35 spas;

36 (f) Tub spout diverters; and

1 (g) Commercial hot food holding cabinets.

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