3.4.6.3 On gas dryers using a continuously burning pilot light—the cubic feet of gas, \( E_{wp} \), consumed by the gas pilot light in one hour.

3.4.6.4 Correct the gas heating value, \( GEF \), as measured in 2.3.2.1 and 2.3.2.2, to standard pressure and temperature conditions in accordance with U.S. Bureau of Standards, circular C117, 1938. A sample calculation is illustrated in appendix E of HLD–1.

3.5 Test for automatic termination field use factor credits. Credit for automatic termination can be claimed for those dryers which meet the requirements for either temperature-sensing control, 1.12, or moisture sensing control, 1.13, and having present the appropriate mark or detent feed defined in 1.11.

4. Calculation of Derived Results From Test Measurements

4.1 Total per-cycle electric dryer energy consumption. Calculate the total electric dryer energy consumption per cycle, \( E_{t} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{t} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]

\( W_{w} \) is the moisture content of the wet test load as recorded in 3.4.2.

\( W_{d} \) is the moisture content of the dry test load as recorded in 3.4.3.

4.2 Per-cycle gas dryer electrical energy consumption. Calculate the gas dryer electrical energy consumption per cycle, \( E_{ge} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{ge} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]

4.3 Per-cycle gas dryer gas energy consumption. Calculate the gas dryer gas energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times GE_{f}
\]

4.4 Per-cycle gas dryer continuously burning pilot light gas energy consumption. Calculate the gas dryer continuously burning pilot light gas energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = \left( \frac{W_{w}}{66} - 140/416 \right) \times GE_{f}
\]

4.5 Total per-cycle gas dryer gas energy consumption expressed in Btu's. Calculate the total gas dryer energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = E_{gp} + E_{wp}
\]

4.6 Total per-cycle gas dryer energy consumption expressed in kilowatt-hours. Calculate the total gas dryer energy consumption per cycle, \( E_{t} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{t} = E_{t} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]

4. Calculation of Derived Results From Test Measurements

4.1 Total per-cycle electric dryer energy consumption. Calculate the total electric dryer energy consumption per cycle, \( E_{t} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{t} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]

\( W_{w} \) is the moisture content of the wet test load as recorded in 3.4.2.

\( W_{d} \) is the moisture content of the dry test load as recorded in 3.4.3.

4.2 Per-cycle gas dryer electrical energy consumption. Calculate the gas dryer electrical energy consumption per cycle, \( E_{ge} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{ge} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]

4.3 Per-cycle gas dryer gas energy consumption. Calculate the gas dryer gas energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times GE_{f}
\]

4.4 Per-cycle gas dryer continuously burning pilot light gas energy consumption. Calculate the gas dryer continuously burning pilot light gas energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = \left( \frac{W_{w}}{66} - 140/416 \right) \times GE_{f}
\]

4.5 Total per-cycle gas dryer gas energy consumption expressed in Btu's. Calculate the total gas dryer energy consumption per cycle, \( E_{gp} \), expressed in Btu's per cycle and defined as:

\[
E_{gp} = E_{gp} + E_{wp}
\]

4.6 Total per-cycle gas dryer energy consumption expressed in kilowatt-hours. Calculate the total gas dryer energy consumption per cycle, \( E_{t} \), expressed in kilowatt-hours per cycle and defined as:

\[
E_{t} = E_{t} = \left( \frac{W_{w}}{66} - W_{d} \right) \times FU \times E_{ge}
\]
preferred automatic termination control setting must be present if the dryer is to be classified as having an “automatic termination control.” A mark is a visible single control setting on one or more dryer controls.

1.5 “Bone dry” means a condition of a load of test clothes which has been dried in a dryer at maximum temperature for a minimum of 10 minutes, removed, and weighed before cool down, and then dried again for 10-minute periods until the final weight change of the load is 1 percent or less.

1.6 “Compact” or “compact size” means a clothes dryer with a drum capacity of less than 4.4 cubic feet.

1.7 “Conventional clothes dryer” means a clothes dryer that exhausts the evaporated moisture from the cabinet.

1.8 “Cool down” means that portion of the clothes drying cycle when the added gas or electric heat is terminated and the clothes continue to tumble and dry within the drum.

1.9 “Cycle” means a sequence of operation of a clothes dryer which performs a clothes drying operation, and may include variations or combinations of the functions of heating, tumbling, and drying.

1.10 “Drum capacity” means the volume of the drying drum in cubic feet.


1.12 “Inactive mode” means a standby mode that facilitates the activation of active mode by remote switch (including remote control), internal sensor, or timer, or that provides continuous status display.

1.13 “Moisture content” means the ratio of the weight of water contained by the test load to the bone-dry weight of the test load, expressed as a percent.

1.14 “Moisture sensing control” means a system which utilizes a moisture sensing element within the dryer drum that monitors the amount of moisture in the clothes and automatically terminates the dryer cycle.

1.15 “Off mode” means a mode in which the clothes dryer is connected to a main power source and is not providing any active or standby mode function, and where the mode may persist for an indefinite time. An indicator that only shows the user that the clothes dryer is connected to a main power source and is not providing any active mode function, or that is associated with a display that provides regular scheduled tasks (e.g., switching) and that operates on a continuous basis.

1.16 “Standard size” means a clothes dryer with a drum capacity of 4.4 cubic feet or greater.

1.17 “Standby mode” means any product modes where the energy using product is connected to a main power source and offers one or more of the following user-oriented or protective functions which may persist for an indefinite time:

(a) To facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer.

(b) Continuous functions, including information or status displays (including clocks) or sensor-based functions. A timer is a continuous clock function (which may or may not be associated with a display) that provides regular scheduled tasks (e.g., switching) and that operates on a continuous basis.

1.18 “Temperature sensing control” means a system which monitors dryer exhaust air temperature and automatically terminates the dryer cycle.

1.19 “Ventless clothes dryer” means a clothes dryer that uses a closed-loop system with an internal condenser to remove the evaporated moisture from the heated air. The moist air is not discharged from the cabinet.

2. TESTING CONDITIONS

2.1 Installation. Install the clothes dryer in accordance with manufacturer’s instructions. For conventional clothes dryers, as defined in 1.7, the dryer exhaust shall be restricted by adding the AHAM exhaust simulator described in 3.3.5.1 of AHAM HLD–1 (incorporated by reference; see §430.3). For ventless clothes dryers, as defined in 1.19, the dryer shall be tested with the AHAM exhaust simulator. Where the manufacturer gives the option to use the dryer both with and without a duct, the dryer shall be tested without the exhaust simulator. All external joints should be taped to avoid air leakage. If the manufacturer gives the option to use a ventless clothes dryer, as defined in 1.19, with or without a condensation box, the dryer shall be tested with the condensation box installed. For ventless clothes dryers, the condenser unit of the dryer must remain in place and not be taken out of the dryer for any reason between tests. For drying testing, disconnect all console lights or other lighting systems on the clothes dryer which do not consume more than 10 watts during the clothes dryer test cycle. For standby and off mode testing, the clothes dryer shall also be installed in accordance with section 5, paragraph 5.2 of IEC 62301 (incorporated by reference; see §430.3). For standby and off mode testing, do not disconnect console lights or other lighting systems.

2.2 Ambient temperature and humidity

2.2.1 For drying testing, maintain the room ambient air temperature at 75 ± 3 °F and the room relative humidity at 50 ± 10 percent relative humidity.

2.2.2 For standby and off mode testing, maintain room ambient air temperature conditions as specified in section 4, paragraph 4.2 of IEC 62301 (incorporated by reference; see §430.3).
2.3 Energy supply.

2.3.1 Electrical supply. Maintain the electrical supply at the clothes dryer terminal block within 1 percent of 120/240 or 120/208Y or 120/240V, applicable to the particular terminal block wiring system and within 1 percent of the nameplate frequency as specified by the manufacturer. If the dryer has a dual voltage conversion capability, conduct the test at the highest voltage specified by the manufacturer.

2.3.1.1 Supply voltage waveform. For the clothes dryer standby mode and off mode testing, maintain the electrical supply voltage waveform indicated in section 4, paragraph 4.4 of IEC 62301 (incorporated by reference; see §430.3).

2.3.2 Gas supply.

2.3.2.1 Natural gas. Maintain the gas supply to the clothes dryer immediately ahead of all controls at a pressure of 7 to 10 inches of water column. If the clothes dryer is equipped with a gas appliance pressure regulator for which the manufacturer specifies an outlet pressure, the regulator outlet pressure shall be approximately that recommended by the manufacturer. The hourly Btu rating of the burner shall be maintained within ±5 percent of the rating specified by the manufacturer. The natural gas supplied should have a heating value of approximately 1,025 Btus per standard cubic foot. The actual heating value, H₂, in Btus per standard cubic foot, for the natural gas to be used in the test shall be obtained either from measurements made by the manufacturer conducting the test using a standard continuous flow calorimeter as described in 2.4.6 or by the purchase of bottled natural gas whose Btu rating is certified to be at least as accurate a rating as could be obtained from measurement with a standard continuous calorimeter as described in 2.4.6.

2.3.2.2 Propane gas. Maintain the gas supply to the clothes dryer immediately ahead of all controls at a pressure of 11 to 13 inches of water column. If the clothes dryer is equipped with a gas appliance pressure regulator for which the manufacturer specifies an outlet pressure, the regulator outlet pressure shall be approximately that recommended by the manufacturer. The hourly Btu rating of the burner shall be maintained within ±5 percent of the rating specified by the manufacturer. The propane gas supplied should have a heating value of approximately 2,500 Btus per standard cubic foot. The actual heating value, H₃, in Btus per standard cubic foot, for the propane gas to be used in the test shall be obtained either from measurements made by the manufacturer conducting the test using a standard continuous flow calorimeter as described in 2.4.6 or by the purchase of bottled gas whose Btu rating is certified to be at least as accurate a rating as could be obtained from measurement with a standard continuous calorimeter as described in 2.4.6.

2.4 Instrumentation. Perform all test measurements using the following instruments as appropriate.

2.4.1 Weighing scale for test cloth. The scale shall have a range of 0 to a maximum of 500 pounds with a resolution of at least 0.2 ounces and a maximum error no greater than 0.3 percent of any measured value within the range of 3 to 15 pounds.

2.4.1.2 Weighing scale for drum capacity measurements. The scale should have a range of 0 to a maximum of 500 pounds with a resolution of 0.50 pounds and a maximum error no greater than 0.5 percent of the measured value.

2.4.2 Kilowatt-hour meter. The kilowatt-hour meter shall have a resolution of 0.001 kilowatt-hours and a maximum error no greater than 0.5 percent of the measured value.

2.4.3 Gas meter. The gas meter shall have a resolution of 0.001 cubic feet and a maximum error no greater than 0.5 percent of the measured value.

2.4.4 Dry and wet bulb psychrometer. The dry and wet bulb psychrometer shall have an error no greater than ±1 ° F.

2.4.5 Temperature. The temperature sensor shall have an error no greater than ±1 ° F.

2.4.6 Standard Continuous Flow Calorimeter. The calorimeter shall have an operating range of 750 to 3,500 Btus per cubic feet. The maximum error of the basic calorimeter shall be no greater than 0.2 percent of the actual heating value of the gas used in the test. The indicator readout shall have a maximum error no greater than 0.5 percent of the measured value within the operating range and a resolution of 0.2 percent of the full-scale reading of the indicator instrument.

2.4.7 Standby mode and off mode watt meter. The watt meter used to measure standby mode and off mode power consumption of the clothes dryer shall have the resolution specified in section 4, paragraph 4.5 of IEC 62301 (incorporated by reference; see §430.3). The watt meter shall also be able to record a “true” average power as specified in section 5, paragraph 5.3.2(a) of IEC 62301.

2.5 Lint trap. Clean the lint trap thoroughly before each test run.

2.6 Test Clothes.

2.6.1 Energy test cloth. The energy test cloth shall be clean and consist of the following:

(a) Pure finished bleached cloth, made with a momie or granite weave, which is a blended fabric of 50-percent cotton and 50-percent polyester and weighs within ±10 percent of 5.75 ounces per square yard after test cloth preconditioning, and has 65 ends on the warp and 57 picks on the fill. The individual warp and fill yarns are a blend of 50-percent cotton and 50-percent polyester fibers.
(b) Cloth material that is 24 inches by 36 inches and has been hemmed to 22 inches by 34 inches before washing. The maximum shrinkage after five washes shall not be more than 4 percent on the length and width.

(c) The number of test runs on the same energy test cloth shall not exceed 25 runs.

2.6.2 Energy stuffer cloths. The energy stuffer cloths shall be made from energy test cloth material, and shall consist of pieces of material that are 12 inches by 12 inches and have been hemmed to 10 inches by 10 inches before washing. The maximum shrinkage after five washes shall not be more than 4 percent on the length and width. The number of test runs on the same energy stuffer cloth shall not exceed 25 runs after test cloth preconditioning.

2.6.3 Test Cloth Preconditioning. A new test cloth load and energy stuffer cloths shall be treated as follows:

(1) Bone dry the load to a weight change of ±1 percent, or less, as prescribed in section 1.5.

(2) Place the test cloth load in a standard clothes washer set at the maximum water fill level. Wash the load for 10 minutes in soft water (17 parts per million hardness or less), using 60.8 grams of AHAM standard test detergent Formula 3. Wash water temperature is to be controlled at 140 °F ± 5 °F (60 °C ± 2.7°C). Rinse water temperature is to be controlled at 100 °F ± 5 °F (37.7 ± 2.7°C).

(3) Rinse the load again at the same water temperature.

(4) Bone dry the load as prescribed in section 1.5 and weigh the load.

(5) This procedure is repeated until there is a weight change of 1 percent or less.

(6) A final cycle is to be a hot water wash with no detergent, followed by two warm water rinses.

2.7 Test loads.

2.7.1 Compact size dryer load. Prepare a bone-dry test load of energy cloths which weighs 8.45 pounds ± 0.085 pounds. Adjustments to the test load to achieve the proper weight can be made by the use of energy stuffer cloths, with no more than five stuffer cloths per load. Dampen the load by agitating it in water whose temperature is 60 °F ± 5 °F and consists of 0 to 17 parts per million hardness for approximately 2 minutes in order to saturate the fabric. Then, extract water from the wet test load by spinning the load until the moisture content of the load is between 54.0–61.0 percent of the bone-dry weight of the test load.

2.7.2 Standard size dryer load. Prepare a bone-dry test load of energy cloths which weighs 8.45 pounds ± 0.085 pounds. Adjustments to the test load to achieve the proper weight can be made by the use of energy stuffer cloths, with no more than five stuffer cloths per load. Dampen the load by agitating it in water whose temperature is 60 °F ± 5 °F and consists of 0 to 17 parts per million hardness for approximately 2 minutes in order to saturate the fabric. Then, extract water from the wet test load by spinning the load until the moisture content of the load is between 54.0–61.0 percent of the bone-dry weight of the test load.
stopped, and the test run is invalid, in which case the condensation box shall be emptied and the test re-run from the beginning. For ventless dryers, as defined in 1.19, during the time between two cycles, the door of the dryer shall be closed except for loading (and unloading).

3.4 Data recording. Record for each test cycle:

3.4.1 Bone-dry weight of the test load described in 2.7.

3.4.2 Moisture content of the wet test load before the test, as described in 2.7.

3.4.3 Moisture content of the dry test load obtained after the test described in 3.3.

3.4.4 Test room conditions, temperature, and percent relative humidity described in 2.2.1.

3.4.5 For electric dryers—the total kilowatt-hours of electric energy, $E_{ge}$, consumed during the test described in 3.3.

3.4.6 For gas dryers:

3.4.6.1 Total kilowatt-hours of electrical energy, $E_{ge}$, consumed during the test described in 3.3.

3.4.6.2 Cubic feet of gas per cycle, $E_{gg}$, consumed during the test described in 3.3.

3.4.6.3 Correct the gas heating value, GEF, as measured in 2.3.2.1 and 2.3.2.2, to standard pressure and temperature conditions in accordance with U.S. Bureau of Standards, Circular C417, 1938.

3.5 Test for automatic termination field use factor. The field use factor for automatic termination can be claimed for those dryers which meet the requirements for automatic termination control, defined in 1.4.

3.6 Standby mode and off mode power. Establish the testing conditions set forth in Section 2 “Testing Conditions” of this appendix, omitting the requirement to disconnect all console light or other lighting systems on the clothes dryer that do not consume more than 10 watts during the clothes dryer test cycle in section 2.1. If the clothes dryer waits in a higher power state at the start of standby mode or off mode before dropping to a lower power state, as discussed in section 5, paragraph 5.1, note 1 of IEC 62301 (incorporated by reference; see §490.3), wait until the clothes dryer passes into the lower power state before starting the measurement. Follow the test procedure specified in section 5, paragraph 5.3 of IEC 62301 for testing in each possible mode as described in 3.6.1 and 3.6.2, except allow the product to stabilize for 30 to 40 minutes and use an energy use measurement period not less than 10 minutes.

3.6.1 If a clothes dryer has an inactive mode, as defined in 1.12, measure and record the average inactive mode power of the clothes dryer, $P_{OFF}$, in watts.

3.6.2 If a clothes dryer has an off mode, as defined in 1.15, measure and record the average off mode power of the clothes dryer, $P_{OFF}$, in watts.

4. Calculation of Derived Results from Test Measurements

4.1 Total Per-cycle electric dryer energy consumption. Calculate the total electric dryer energy consumption per cycle, $E_{ee}$, expressed in kilowatt-hours per cycle and defined as:

$$E_{ee} = \left[ \frac{53.5}{W_d - W_d} \right] \times E_{ge} \times \text{field use},$$

Where:

- $53.5 = \text{an experimentally established value for the percent reduction in the moisture content of the test load during a laboratory test cycle expressed as a percent.}$
- $W_d = \text{the moisture content of the wet test load as recorded in 3.4.2.}$
- $W_d = \text{the moisture content of the dry test load as recorded in 3.4.3.}$

4.2 Per-cycle gas dryer electrical energy consumption. Calculate the gas dryer electrical energy consumption per cycle, $E_{ge}$, expressed in kilowatt-hours per cycle and defined as:

$$E_{ge} = \left[ \frac{53.5}{W_w - W_w} \right] \times E_{gg} \times \text{field use},$$

Where:

- $E_{gg} = \text{the energy recorded in 3.4.6.1 field use,}$
- $W_w = \text{the moisture content of the dry test load as recorded in 3.4.3.}$

4.3 Per-cycle gas dryer gas energy consumption. Calculate the gas dryer gas energy consumption per cycle, $E_{gg}$, expressed in Btu per cycle as defined as:

$$E_{gg} = \left[ \frac{53.5}{W_w - W_w} \right] \times GEF \times \text{field use} \times \text{GEF},$$

Where:

- $E_{gg} = \text{the energy recorded in 3.4.6.2}$
- $\text{GEF} = \text{corrected gas heat value (Btu per cubic foot) as defined in 3.4.6.3, field use,}$
- $33.5 = \text{cubic feet per cycle,}$
- $W_w = \text{as defined in 4.1.}$

4.4 Total per-cycle gas dryer energy consumption expressed in kilowatt-hours. Calculate the total gas dryer energy consumption per cycle, $E_{gc}$, expressed in kilowatt-hours per cycle and defined as:

$$E_{gc} = E_{gg} + (E_{gg} \times 3412 \text{ Btu/kWh})$$
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Where:

\( E_{cc} \) as defined in 4.2

\( E_{in} \) as defined in 4.3

4.5 Per-cycle standby mode and off mode energy consumption. Calculate the dryer inactive mode and off mode energy consumption per cycle, \( E_{TSO} \), expressed in kWh per cycle and defined as:

\[
E_{TSO} = [(P_{IA} \times S_{IA}) + (P_{OFF} \times S_{OFF})] \times K \times 283
\]

Where:

\( P_{IA} \) = dryer inactive mode power, in watts, as measured in section 3.6.1;

\( P_{OFF} \) = dryer off mode power, in watts, as measured in section 3.6.2.

If the clothes dryer has both inactive mode and off mode, \( S_{IA} \) and \( S_{OFF} \) both equal \( 8,620 \times 2 = 4,310 \), where \( 8,620 \) is the total inactive and off mode annual hours;

If the clothes dryer has an inactive mode but no off mode, the inactive mode annual hours, \( S_{IA} \), is equal to \( 8,620 \) and the off mode annual hours, \( S_{OFF} \), is equal to \( 0 \);

If the clothes dryer has an off mode but no inactive mode, \( S_{IA} \) is equal to \( 0 \) and \( S_{OFF} \) is equal to \( 8,620 \)

Where:

\( K \) = 0.001 kWh/Wh conversion factor for watt-hours to kilowatt-hours; and

\( 283 \) = representative average number of clothes dryer cycles in a year.

4.6 Per-cycle combined total energy consumption expressed in kilowatt-hours. Calculate the per-cycle combined total energy consumption, \( E_{CC} \), expressed in kilowatt-hours per cycle and defined for an electric clothes dryer as:

\[
E_{CC} = E_{in} + E_{TSO}
\]

Where:

\( E_{in} \) = the energy recorded in 4.1, and

\( E_{TSO} \) = the energy recorded in 4.7, and defined for a gas clothes dryer as:

\[
E_{CC} = E_{in} + E_{TSO}
\]

Where:

\( E_{in} \) = the energy recorded in 4.4, and

\( E_{TSO} \) = the energy recorded in 4.7.

4.7 Energy Factor in pounds per kilowatt-hour. Calculate the energy factor, EF, expressed in pounds per kilowatt-hour and defined for an electric clothes dryer as:

\[
EF = \frac{W_{bonedry}}{E_{in}}
\]

Where:

\( W_{bonedry} \) = the bone dry test load weight recorded in 3.4.1. and

\( E_{in} \) = the energy recorded in 4.1, and

\( E_{TSO} \) = the energy recorded in 4.4, and

\( E_{CC} \) = the energy recorded in 4.7.

EF = water heater overall efficiency.

1.5 First-Hour Rating means an estimate of the maximum volume of “hot” water that a storage-type water heater can supply within an hour that begins with the water heater fully heated (i.e., with all thermostats satisfied). It is a function of both the storage volume and the recovery rate.

1.6 Heat Trap means a device which can be integrally connected or independently attached to the hot and/or cold water pipe connections of a water heater such that the device will develop a thermal or mechanical seal to minimize the recirculation of water due to thermal convection between the water heater tank and its connecting pipes.

1.7 Instantaneous Water Heaters

1.7.1 Electric Instantaneous Water Heater Reserved.

1.7.2 Gas Instantaneous Water Heater means a water heater that uses gas as the energy source, initiates heating based on sensing water flow, is designed to deliver water at a controlled temperature of less than 180 °F (82 °C), has an input greater than 50,000 Btu/h (53 MJ/h) but less than 200,000 Btu/h (210 MJ/h), and has a manufacturer’s specified storage capacity of less than 2 gallons (7.6 liters). The unit may use a fixed or variable burner input.

4.8 Combined Energy Factor in pounds per kilowatt-hour. Calculate the combined energy factor, CEF, expressed in pounds per kilowatt-hour and defined as:

\[
CEF = \frac{W_{bonedry}}{E_{CC}}
\]

Where:

\( W_{bonedry} \) = the bone dry test load weight 3.4.1, and

\( E_{CC} \) = the energy recorded in 4.6

[76 FR 1032, Jan. 6, 2011]

APPENDIX E TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF WATER HEATERS

1. Definitions

1.1 Cut-in means the time when or water temperature at which a water heater control or thermostat acts to increase the energy or fuel input to the heating elements, compressor, or burner.

1.2 Cut-out means the time when or water temperature at which a water heater control or thermostat acts to reduce to a minimum the energy or fuel input to the heating elements, compressor, or burner.

1.3 Design Power Rating means the nominal power rating that a water heater manufacturer assigns to a particular design of water heater, expressed in kilowatts or Btu (kJ) per hour as appropriate.

1.4 Energy Factor means a measure of water heater overall efficiency.

1.5 First-Hour Rating means an estimate of the maximum volume of “hot” water that a storage-type water heater can supply within an hour that begins with the water heater fully heated (i.e., with all thermostats satisfied). It is a function of both the storage volume and the recovery rate.

1.6 Heat Trap means a device which can be integrally connected or independently attached to the hot and/or cold water pipe connections of a water heater such that the device will develop a thermal or mechanical seal to minimize the recirculation of water due to thermal convection between the water heater tank and its connecting pipes.

1.7 Instantaneous Water Heaters

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1.7.2 Gas Instantaneous Water Heater means a water heater that uses gas as the energy source, initiates heating based on sensing water flow, is designed to deliver water at a controlled temperature of less than 180 °F (82 °C), has an input greater than 50,000 Btu/h (53 MJ/h) but less than 200,000 Btu/h (210 MJ/h), and has a manufacturer’s specified storage capacity of less than 2 gallons (7.6 liters). The unit may use a fixed or variable burner input.