

## APPENDIX D1 TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF CLOTHES DRYERS

NOTE: Effective February 10, 2014, manufacturers must make representations of energy efficiency, including certifications of compliance, using appendix D. Compliance with DOE's amended standards for clothes dryers, and corresponding use of the test procedures at appendix D1 for all representations, including certifications of compliance, is required as of January 1, 2015. Manufacturers must use a single appendix for all representations, including certifications of compliance, and may not use appendix D for certain representations and appendix D1 for other representations. The procedures in appendix D2 need not be performed to determine compliance with energy conservation standards for clothes dryers at this time. However, manufacturers may elect to use the amended appendix D, D1, or D2 early.

## 1. DEFINITIONS

1.1 "Active mode" means a mode in which the clothes dryer is connected to a main power source, has been activated and is performing the main function of tumbling the clothing with or without heated or unheated forced air circulation to remove moisture from the clothing, remove wrinkles or prevent wrinkling of the clothing, or both.

1.2 "AHAM" means the Association of Home Appliance Manufacturers.

1.3 "AHAM HLD-1" means the test standard published by the Association of Home Appliance Manufacturers, titled "Household Tumble Type Clothes Dryers" (2009), AHAM HLD-1-2009 (incorporated by reference; see § 430.3).

1.4 "Automatic termination control" means a dryer control system with a sensor which monitors either the dryer load temperature or its moisture content and with a controller which automatically terminates the drying process. A mark, detent, or other visual indicator or detent which indicates a 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.

1.11 "IEC 62301" (Second Edition) means the test standard published by the International Electrotechnical Commission ("IEC") titled "Household electrical appliances—Measurement of standby power," Publication 62301 (Edition 2.0 2011-01) (incorporated by reference; see § 430.3).

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 product is in the off position is included within the classification of an off mode.

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.

2.1.1 *All clothes dryers.* For both conventional clothes dryers and ventless clothes dryers, as defined in sections 1.7 and 1.19 of this appendix, install the clothes dryer in accordance with manufacturer’s instructions as shipped with the unit. If the manufacturer’s instructions do not specify the installation requirements for a certain component, it shall be tested in the as-shipped condition. 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 described in section 3.3.5.1 of AHAM HLD-1 (incorporated by reference; see § 430.3). All external joints should be taped to avoid air leakage. For drying testing, disconnect all lights, such as task lights, that do not provide any information related to the drying process on the clothes dryer and that do not consume more than 10 watts during the clothes dryer test cycle. Control setting indicator lights showing the cycle progression, temperature or dryness settings, or other cycle functions that cannot be turned off during the test cycle shall not be disconnected during the active mode 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 (Second Edition) (incorporated by reference; see § 430.3), disregarding the provisions regarding batteries and the determination, classification, and testing of relevant modes. For standby and off mode testing, all lighting systems shall remain connected.

2.1.2 *Conventional clothes dryers.* For conventional clothes dryers, as defined in section 1.7 of this appendix, the dryer exhaust shall be restricted by adding the AHAM exhaust simulator described in section 3.3.5.1 of AHAM HLD-1 (incorporated by reference; see § 430.3).

2.1.3 *Ventless clothes dryers.* For ventless clothes dryers, as defined in section 1.19, the dryer shall be tested without the AHAM exhaust simulator. If the manufacturer gives the option to use a ventless clothes dryer, 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.

### 2.2 Ambient temperature and humidity.

2.2.1 For drying testing, maintain the room ambient air temperature at  $75 \pm 3$  °F and the room relative humidity at  $50 \pm 10$  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 (Second Edition) (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 volts as 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 4.3.2 of IEC 62301 (Second Edition) (incorporated by reference; see § 430.3). If the power measuring instrument used for testing is unable to measure and record the total harmonic content during the test measurement period, it is acceptable to measure and record the total harmonic content immediately before and after the test measurement period.

### 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 within  $\pm 10$  percent of the value recommended by the manufacturer in the installation manual, on the nameplate sticker, or wherever the manufacturer makes such a recommendation for the basic model. The hourly Btu rating of the burner shall be maintained within  $\pm 5$  percent of the rating specified by the manufacturer. If the requirement to maintain the hourly Btu rating of the burner within  $\pm 5$  percent of the rating specified by the manufacturer cannot be achieved under the allowable range in gas inlet test pressure, the orifice of the gas burner should be modified as necessary to achieve the required Btu rating. The natural gas supplied should have a heating value of approximately 1,025 Btus per standard cubic foot. The actual heating value,  $H_v$ , 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 section 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 measurements with a standard continuous flow calorimeter as described in section 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 within  $\pm 10$  percent of the value recommended by the manufacturer in the installation manual, on the nameplate sticker, or wherever the manufacturer makes such a recommendation for the basic model. The hourly Btu rating of the burner shall be maintained within  $\pm 5$  percent of the rating specified by the manufacturer. If the requirement to maintain the hourly Btu rating of the burner within  $\pm 5$  percent of the rating specified by the manufacturer cannot be achieved under the allowable range in gas inlet test pressure, the orifice of the gas burner should be modified as necessary to achieve the required Btu rating. The propane gas supplied should have a heating value of approximately 2,500 Btus per standard cubic foot. The actual heating value,  $H_p$ , 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 section 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 section 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 60 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 600 pounds with 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  $\pm 1$  °F. A relative humidity meter with a maximum error tolerance expressed in °F equivalent to the requirements for the dry and wet bulb psychrometer or with a maximum error tolerance of  $\pm 2$  percent relative humidity would

be acceptable for measuring the ambient humidity.

2.4.5 *Temperature.* The temperature sensor shall have an error no greater than  $\pm 1$  °F.

2.4.6 *Standard Continuous Flow Calorimeter.* The calorimeter shall have an operating range of 750 to 3,500 Btu 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 shall meet the requirements specified in section 4, paragraph 4.4 of IEC 62301 (Second Edition) (incorporated by reference; see § 430.3). If the power measuring instrument used for testing is unable to measure and record the crest factor, power factor, or maximum current ratio during the test measurement period, it is acceptable to measure the crest factor, power factor, and maximum current ratio immediately before and after the test measurement period.

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  $\pm 1$  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  $140 \pm 5$  °F ( $60 \pm 2.7$  °C). Rinse water temperature is to be controlled at  $100 \pm 5$  °F ( $37.7 \pm 2.7$  °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 3.00 pounds  $\pm 0.03$  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  $60 \pm 5$  °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  $\pm 0.085$  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  $60 \pm 5$  °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.

2.7.3 *Method of loading.* Load the energy test cloths by grasping them in the center, shaking them to hang loosely, and then dropping them in the dryer at random.

#### 2.8 Clothes dryer preconditioning.

2.8.1 *Conventional clothes dryers.* For conventional clothes dryers, before any test cycle, operate the dryer without a test load in the non-heat mode for 15 minutes or until the discharge air temperature is varying less than 1 °F for 10 minutes—whichever is longer—in the test installation location with the ambient conditions within the specified test condition tolerances of 2.2.

2.8.2 *Ventless clothes dryers.* For ventless clothes dryers, before any test cycle, the steady-state machine temperature must be equal to ambient room temperature described in 2.2.1. This may be done by leaving the machine at ambient room conditions for at least 12 hours between tests.

### 3. TEST PROCEDURES AND MEASUREMENTS

3.1 *Drum Capacity.* Measure the drum capacity by sealing all openings in the drum except the loading port with a plastic bag, and ensuring that all corners and depressions are filled and that there are no extrusions of the plastic bag through any openings in the interior of the drum. Support the dryer's rear drum surface on a platform scale to prevent deflection of the drum surface, and record the weight of the empty dryer. Fill the drum with water to a level determined by the intersection of the door plane and the loading port (*i.e.*, the uppermost edge of the drum that is in contact with the door seal). Record the temperature of the water and then the weight of the dryer with the added water and then determine the mass of the water in pounds. Add the appropriate volume to account for any space in the drum interior not measured by water fill (*e.g.*, the space above the uppermost edge of the drum within a curved door) and subtract the appropriate volume to account for space that is measured by water fill but cannot be used when the door is closed (*e.g.*, space occupied by the door when closed). The drum capacity is calculated as follows:

$$C = w/d \pm \text{volume adjustment}$$

$C$  = capacity in cubic feet.

$w$  = mass of water in pounds.

$d$  = density of water at the measured temperature in pounds per cubic foot.

3.2 *Dryer Loading.* Load the dryer as specified in 2.7.

3.3 *Test cycle.* Operate the clothes dryer at the maximum temperature setting and, if equipped with a timer, at the maximum time setting. Any other optional cycle settings that do not affect the temperature or time settings shall be tested in the as-shipped position. If the clothes dryer does not have a separate temperature setting selection on the control panel, the maximum time setting should be used for the drying test cycle. Dry the load until the moisture content of the test load is between 2.5 and 5.0 percent of the bone-dry weight of the test load, at which point the test cycle is stopped, but do not permit the dryer to advance into cool down. If required, reset the timer to increase the length of the drying cycle. After stopping the test cycle, remove and weigh the test load. The clothes dryer shall not be stopped intermittently in the middle of the test cycle for any reason. Record the data specified by section 3.4 of this appendix. If the dryer automatically stops during a cycle

because the condensation box is full of water, the test is 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 section 1.19 of this appendix, 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,  $E_t$ , consumed during the test described in 3.3.

3.4.6 For gas dryers:

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

3.4.6.2 Cubic feet of gas per cycle,  $E_{ge}$ , 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. For clothes dryers that take some time to enter a stable state from a higher power state as discussed in Section 5, Paragraph 5.1, Note 1 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3), allow sufficient time for the clothes dryer to reach the lower power state before proceeding with the test measurement. Follow the test procedure specified in section 5, paragraph 5.3.2 of IEC 62301 (Second Edition) for testing in each possible mode as described in sections 3.6.1 and 3.6.2 of this appendix.

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,  $P_{IA}$ , 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,  $E_{ce}$ , expressed in kilowatt-hours per cycle and defined as:

$$E_{ce} = [53.5/(W_w - W_d)] \times E_{te} \times \text{field use},$$

Where:

53.5 = 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.

field use = field use factor.

= 1.18 for clothes dryers with time termination control systems only without any automatic termination control functions.

= 1.04 clothes dryers with automatic control systems that meet the requirements of the definition for automatic control systems in 1.4, 1.14 and 1.18, including those that also have a supplementary timer control, or that may also be manually controlled.

$W_w$  = the moisture content of the wet test load as recorded in 3.4.2.

$W_d$  = 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:

$$E_{ge} = [53.5/(W_w - W_d)] \times E_{te} \times \text{field use},$$

Where:

$E_{te}$  = the energy recorded in 3.4.6.1 field use, 53.5,  $W_w$ ,  $W_d$  as defined in 4.1.

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

$$E_{gg} = [53.5/(W_w - W_d)] \times E_{ge} \times \text{field use} \times \text{GEF}$$

Where:

$E_{ge}$  = the energy recorded in 3.4.6.2

GEF = corrected gas heat value (Btu per cubic feet) as defined in 3.4.6.3, field use, 53.5,  $W_w$ ,  $W_d$  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,  $E_{cg}$ , expressed in kilowatt-hours per cycle and defined as:

$$E_{cg} = E_{ge} + (E_{gg}/3412 \text{ Btu/kWh})$$

Where:

$E_{ge}$  as defined in 4.2

$E_{gg}$  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:

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

Where:

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$P_{IA}$  = 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  $8,620 \div 2 = 4,310$ , 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:

$$E_{CC} = E_{ce} + E_{Tso}$$

Where:

$E_{ce}$  = the energy recorded in section 4.1 of this appendix, and

$E_{Tso}$  = the energy recorded in section 4.5 of this appendix, and defined for a gas clothes dryer as:

$$E_{CC} = E_{cg} + E_{Tso}$$

Where:

$E_{cg}$  = the energy recorded in section 4.4 of this appendix, and

$E_{Tso}$  = the energy recorded in section 4.5 of this appendix.

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:

$$EF = W_{bonedry} / E_{ce}$$

Where:

$W_{bonedry}$  = the bone dry test load weight recorded in 3.4.1, and

$E_{ce}$  = the energy recorded in 4.1, and defined for a gas clothes dryer as:

$$EF = W_{bonedry} / E_{cg}$$

Where:

$W_{bonedry}$  = the bone dry test load weight recorded in 3.4.1, and

$E_{cg}$  = the energy recorded in 4.4,

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:

$$CEF = W_{bonedry} / E_{CC}$$

Where:

$W_{bonedry}$  = the bone dry test load weight 3.4.1, and

$E_{CC}$  = the energy recorded in 4.6

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**APPENDIX D2 TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF CLOTHES DRYERS**

NOTE: The procedures in appendix D2 need not be performed to determine compliance with energy conservation standards for clothes dryers at this time. Manufacturers may elect to use the amended appendix D2 early to show compliance with the January 1, 2015 energy conservation standards. Manufacturers must use a single appendix for all representations, including certifications of compliance, and may not use appendix D1 for certain representations and appendix D2 for other representations.

*1. Definitions*

1.1 “Active mode” means a mode in which the clothes dryer is connected to a main power source, has been activated and is performing the main function of tumbling the clothing with or without heated or unheated forced air circulation to remove moisture from the clothing, remove wrinkles or prevent wrinkling of the clothing, or both.

1.2 “AHAM” means the Association of Home Appliance Manufacturers.

1.3 “AHAM HLD-1” means the test standard published by the Association of Home Appliance Manufacturers, titled “Household Tumble Type Clothes Dryers,” (2009), AHAM HLD-1-2009 (incorporated by reference; see § 430.3).

1.4 “Automatic termination control” means a dryer control system with a sensor which monitors either the dryer load temperature or its moisture content and with a controller which automatically terminates the drying process. A mark, detent, or other visual indicator or detent which indicates a 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 “Automatic termination control dryer” means a clothes dryer which can be preset to carry out at least one sequence of operations to be terminated by means of a system assessing, directly or indirectly, the moisture content of the load. An automatic termination control dryer with supplementary timer or that may also be manually controlled shall be tested as an automatic termination control dryer.

1.6 “Bone dry” means a condition of a load of test clothes which has been dried in a