3.3.4.3. *Power Line Carrier (PLC) Control Signal.* Measure the PLC control signal power (watts), using a wattmeter (W), connected to the ballast in accordance with the circuit shown in Figure 6 of this section. The wattmeter must have a frequency response that is at least 10 times higher than the PLC being measured in order to measure the PLC signal correctly. The wattmeter must also be high-pass filtered to filter out power at 60 Hertz.

3.3.4.4. *Wireless Control Signal.* The power supplied to a ballast using a wireless signal is not easily measured, but is estimated to be well below 1.0 watt. Therefore, the wireless control signal power is not measured as part of this test procedure.


APPENDIX R TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING AVERAGE LAMP EFFICIENCY (LE), COLOR RENDERING INDEX (CRI), AND CORRELATED COLOR TEMPERATURE (CCT) OF ELECTRIC LAMPS

1. *Scope:* This appendix applies to the measurement of lamp lumens, electrical characteristics for general service incandescent lamps and incandescent reflector lamps.

2. *Definitions*
   2.1 To the extent that definitions in the referenced IESNA and CIE standards do not conflict with the DOE definitions, the definitions specified in section 3.6 of IES LM–9 (incorporated by reference; see §430.3), section 3.0 of IESNA LM–20 (incorporated by reference; see §430.3), section 3.0 and the Glossary of IES LM–45 (incorporated by reference; see §430.3), section 2 of IESNA LM–58 (incorporated by reference; see §430.3), and Appendix 1 of CIE 13.3 (incorporated by reference; see §430.3) shall be included.

2.2 *ANSI Standard* means a standard developed by a committee accredited by the American National Standards Institute (ANSI).

2.3 *CIE* means the International Commission on Illumination.

2.4 *CRI* means Color Rendering Index as defined in §430.2.
2.5 IESNA means the Illuminating Engineering Society of North America.

2.6 Lamp efficacy means the ratio of measured lamp lumen output in lumens to the measured lamp electrical power input in watts, rounded to the nearest tenth, in units of lumens per watt.

2.7 Lamp lumen output means the total luminous flux produced by the lamp, at the reference condition, in units of lumens.

2.8 Lamp electrical power input means the total electrical power input to the lamp, including both arc and cathode power where appropriate, at the reference condition, in units of watts.

2.9 Reference condition means the test condition specified in IESNA LM-45 for general service incandescent lamps, the stochastic test condition specified in IESNA LM-20 for general service reflector lamps, and in IES LM-45 for general service fluorescent lamps.

3. Test Conditions

3.1 General Service Fluorescent Lamps: For general service fluorescent lamps, the ambient conditions of the test and the electrical circuits, reference ballasts, stabilization requirements, instruments, detectors, and photometric test procedure and test report shall be as described in the relevant sections of IES LM-9 (incorporated by reference; see §430.3).

3.2 General Service Incandescent Lamps: For general service incandescent lamps, the selection and seasoning (initial burn-in) of the test lamps, the equipment and instrumentation, and the test conditions shall be as described in IES LM-45 (incorporated by reference; see §430.3).

3.3 Incandescent Reflector Lamps: For incandescent reflector lamps, the selection and seasoning (initial burn-in) of the test lamps, the equipment and instrumentation, and the test conditions shall conform to sections 4.2 and 5.0 of IESNA LM-20 (incorporated by reference; see §430.3).

4. Test Methods and Measurements

All lumen measurements made with instruments calibrated to the devalued NIST lumen after January 1, 1996, shall be multiplied by 1.011.

4.1 General Service Fluorescent Lamps

4.1.1 The measurement procedure shall be as described in IES LM-9 (incorporated by reference; see §430.3), except that lamps shall be operated at the appropriate voltage and current conditions as described in ANSI C78.375 (incorporated by reference; see §430.3) and in ANSI C78.81 (incorporated by reference; see §430.3) or ANSI C78.901 (incorporated by reference; see §430.3), and lamps shall be operated using the appropriate reference ballast at input voltage specified by the reference circuit as described in ANSI C82.3 (incorporated by reference; see §430.3).

4.1.2 For lamps not listed in ANSI C78.81 (incorporated by reference; see §430.3) nor in ANSI C78.901 (incorporated by reference; see §430.3), the lamp shall be operated using the following reference ballast settings:

4.1.2.1 4-Foot medium bi-pin lamps shall be operated using the following reference ballast settings:

- **T12 lamps**: 625 volts, 0.425 amps, and 1280 ohms.
- **T8 lamps**: 625 volts, 0.269 amps, and 1960 ohms.

4.1.2.2 2-Foot U-shaped lamps shall be operated using the following reference ballast settings:

- **T12 lamps**: 329 volts, 0.170 amps, and 595 ohms.
- **T8 lamps**: 235 volts, 0.460 amps, and 255 ohms.

4.1.2.3 8-Foot slimline lamps shall be operated using the following reference ballast settings:

- **T12 lamps**: 450 volts, 0.395 amps, and 505 ohms.

4.1.2.4 8-Foot high output lamps shall be operated using the following reference ballast settings:

- **T12 lamps**: 400 volts, 0.800 amps, and 415 ohms.
- **T8 lamps**: 450 volts, 0.395 amps, and 595 ohms.

4.1.2.5 4-Foot miniature bipin standard output or high output lamps shall be operated using the following reference ballast settings:

- **Standard Output**: 329 volts, 0.170 amps, and 950 ohms.
- **High Output**: 235 volts, 0.460 amps, and 255 ohms.

4.1.3 Lamp lumen output means the total luminous flux produced by the lamp, at the reference condition, as described in IES LM-9 for general service incandescent lamps, the stochastic test condition specified in IESNA LM-20 for general service fluorescent lamps, and in IES LM-45 for general service incandescent lamps.

4.2 General Service Incandescent Lamps

4.2.1 The measurement procedure shall be as described in IES LM-45 (incorporated by reference; see §430.3).

4.2.2 The test procedure shall conform to sections 6 and 7 of IES LM-45, and the lumen output of the lamp shall be determined in accordance with section 7 of IES LM-45. Lamp electrical power input in watts shall be measured and recorded. Lamp efficacy shall be determined by computing the ratio of the measured lamp lumen output and lamp electrical power input at equilibrium for the reference condition. The test report shall conform to section 8 of IES LM-45.
APPENDIX S TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE WATER CONSUMPTION OF FAUCETS AND SHOWERHEADS

1. Scope: This appendix covers the test requirements used to measure the hydraulic performance of faucets and showerheads.

2. Flow Capacity Requirements:

a. Faucets—The test procedures to measure the water flow rate for faucets, expressed in gallons per minute (gpm) and liters per minute (L/min), or gallons per cycle (gal/cycle) and liters per cycle (L/cycle), shall be conducted in accordance with the test requirements specified in section 6.5, Flow Capacity Test, of the ASME/ANSI Standard A112.18.1M-1996 (see §430.22). Measurements shall be recorded at the resolution of the test instrumentation. Calculations shall be rounded off to the same number of significant digits as the previous step. The final water consumption value shall be rounded to one decimal place for non-metered faucets, or two decimal places for metered faucets.

b. Showerheads—The test conditions to measure the water flow rate for showerheads, expressed in gallons per minute (gpm) and liters per minute (L/min), shall be conducted in accordance with the test requirements specified in section 6.5, Flow Capacity Test, of the ASME/ANSI Standard A112.18.1M-1996 (see §430.22). Measurements shall be recorded at the resolution of the test instrumentation. Calculations shall be rounded off to the same number of significant digits as the previous step. The final water consumption value shall be rounded to one decimal place.

[63 FR 13316, Mar. 18, 1998]

APPENDIX T TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE WATER CONSUMPTION OF WATER CLOSETS AND URINALS

1. Scope: This appendix covers the test requirements used to measure the hydraulic performances of water closets and urinals.

2. Test Apparatus and General Instructions:

a. The test apparatus and instructions for testing water closets shall conform to the requirements specified in section 7.1.2, Test Apparatus and General Requirements, subsections 7.1.2.1, 7.1.2.2, and 7.1.2.3 of the ASME/ANSI Standard A112.19.6-1995 (see §430.22). Measurements shall be recorded at the resolution of the test instrumentation. Calculations shall be rounded off to the same number of significant digits as the previous