

**§ 431.322 Definitions concerning metal halide lamp ballasts and fixtures.**

*AC control signal* means an alternating current (AC) signal that is supplied to the ballast using additional wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

*Active mode* means the condition in which an energy-using product:

- (1) Is connected to a main power source;
- (2) Has been activated; and
- (3) Provides one or more main functions.

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

*Ballast efficiency* means, in the case of a high intensity discharge fixture, the efficiency of a lamp and ballast combination, expressed as a percentage, and calculated in accordance with the following formula:  $\text{Efficiency} = P_{\text{out}}/P_{\text{in}}$  where:

- (1)  $P_{\text{out}}$  equals the measured operating lamp wattage;
- (2)  $P_{\text{in}}$  equals the measured operating input wattage;
- (3) The lamp, and the capacitor when the capacitor is provided, shall constitute a nominal system in accordance with the ANSI C78.43, (incorporated by reference; see § 431.323);
- (4) For ballasts with a frequency of 60 Hz,  $P_{\text{in}}$  and  $P_{\text{out}}$  shall be measured after lamps have been stabilized according to section 4.4 of ANSI C82.6 (incorporated by reference; see § 431.323) using a wattmeter with accuracy specified in section 4.5 of ANSI C82.6; and
- (5) For ballasts with a frequency greater than 60 Hz,  $P_{\text{in}}$  and  $P_{\text{out}}$  shall have a basic accuracy of  $\pm 0.5$  percent at the higher of either 3 times the output operating frequency of the ballast or 2.4 kHz.

*Basic model* means, with respect to metal halide lamp ballasts, all units of a given type of metal halide lamp ballast (or class thereof) that:

- (1) Are rated to operate a given lamp type and wattage;
- (2) Have essentially identical electrical characteristics; and

- (3) Have no differing electrical, physical, or functional characteristics that affect energy consumption.

*DC control signal* means a direct current (DC) signal that is supplied to the ballast using additional wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

*Electronic ballast* means a device that uses semiconductors as the primary means to control lamp starting and operation.

*Metal halide ballast* means a ballast used to start and operate metal halide lamps.

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

*Metal halide lamp fixture* means a light fixture for general lighting application designed to be operated with a metal halide lamp and a ballast for a metal halide lamp.

*Off mode* means the condition in which an energy-using product:

- (1) Is connected to a main power source; and
- (2) Is not providing any standby or active mode function.

*PLC control signal* means a power line carrier (PLC) signal that is supplied to the ballast using the input ballast wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

*Probe-start metal halide ballast* means a ballast that starts a probe-start metal halide lamp that contains a third starting electrode (probe) in the arc tube, and does not generally contain an igniter but instead starts lamps with high ballast open circuit voltage.

*Pulse-start metal halide ballast* means an electronic or electromagnetic ballast that starts a pulse-start metal halide lamp with high voltage pulses, where lamps shall be started by the ballast first providing a high voltage pulse for ionization of the gas to produce a glow discharge and then power to sustain the discharge through the glow-to-arc transition.

*Standby mode* means the condition in which an energy-using product:

- (1) Is connected to a main power source; and

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(2) Offers one or more of the following user-oriented or protective functions:

(i) To facilitate the activation or deactivation of other functions (including active mode) by remote switch (including remote control), internal sensor, or timer;

(ii) Continuous functions, including information or status displays (including clocks) or sensor-based functions.

*Wireless control signal* means a wireless signal that is radiated to and received by the ballast for the purpose of controlling the ballast and putting the ballast in standby mode.

[74 FR 12075, Mar. 23, 2009, as amended at 75 FR 10966, Mar. 9, 2010]

### TEST PROCEDURES

#### § 431.323 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart S of Part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html). Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202-586-2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays, or go to: [http://www1.eere.energy.gov/buildings/appliance\\_standards/](http://www1.eere.energy.gov/buildings/appliance_standards/). Standards can be obtained from the sources listed below.

(b) *ANSI.* American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, 212-642-4900, or go to <http://www.ansi.org>.

(1) ANSI C78.43-2004, Revision and consolidation of ANSI C78.1372-1997, .1374-1997, .1375-1997, .1376-1997, .1377-1997, .1378-1997, .1379-1997, .1382-1997, .1384-1997, and .1650-2003 (“ANSI C78.43”), American National Standard for electric lamps: Single-Ended Metal Halide Lamps, approved May 5, 2004, IBR approved for § 431.322;

(2) ANSI C82.6-2005, Proposed Revision of ANSI C82.6-1985 (“ANSI C82.6”), American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement, approved February 14, 2005, IBR approved for § 431.322; and § 431.324.

(c) *NFPA.* National Fire Protection Association, 11 Tracy Drive, Avon, MA 02322, 1-800-344-3555, or go to <http://www.nfpa.org>;

(1) NFPA 70-2002 (“NFPA 70”), National Electrical Code 2002 Edition, IBR approved for § 431.326;

(2) [Reserved]

(e) *UL.* Underwriters Laboratories, Inc., COMM 2000, 1414 Brook Drive, Downers Grove, IL 60515, 1-888-853-3503, or go to <http://www.ul.com>.

(1) UL 1029 (ANSI/UL 1029-2007) (“UL 1029”), Standard for Safety High-Intensity-Discharge Lamp Ballasts, 5th edition, May 25, 1994, which consists of pages dated May 25, 1994, September 28, 1995, August 3, 1998, February 7, 2001 and December 11, 2007, IBR approved for § 431.326.

(2) [Reserved]

[74 FR 12075, Mar. 23, 2009, as amended at 75 FR 10966, Mar. 9, 2010]

#### § 431.324 Uniform test method for the measurement of energy efficiency and standby mode energy consumption of metal halide lamp ballasts.

(a) *Scope.* This section provides test procedures for measuring, pursuant to EPCA, the energy efficiency of metal halide ballasts.

(b) *Testing and Calculations Active Mode.* (1)(i) *Test Conditions.* The power supply, ballast test conditions, lamp position, lamp stabilization, and test instrumentation shall all conform to the requirements specified in section 4.0, “General Conditions for Electrical