

## § 431.321

(iii) The air velocity must be maintained as natural convection conditions as described in ASTM C1363. The test must be completed using the masked method and with surround panel in place as described in ASTM C1363.

### (3) Required Test Measurements

#### (i) Non-floor Panels

1. Panel Edge Region U-factor:  $U_{nf, edge}$

2. Panel Core Region U-factor:  $U_{nf, core}$

#### (ii) Floor Panels

1. Floor Panel Edge Region U-factor:  $U_{fp, edge}$

2. Floor Panel Core Region U-factor:  $U_{fp, core}$

### 5.2 Measuring Long Term Thermal Resistance (LTTR) of Insulating Foam

Follow the test procedure in Annex C of DIN EN 13164 or Annex C of DIN EN 13165 (as applicable), (incorporated by reference; see § 431.303), exactly, with these exceptions:

#### (1) Temperatures During Thermal Resistance Measurement

(i) For freezers: 20 °F ± 1 °F must be used.

(ii) For coolers: 55 °F ± 1 °F must be used.

#### (2) Sample Panel Preparation

(i) A 800mm × 800mm square (× thickness of the panel) section cut from the geometric center of the panel that is being tested must be used as the sample for completing DIN EN 13165.

(ii) A 500mm × 500mm square (× thickness of the panel) section cut from the geometric center of the panel that is being tested must be used as the sample for completing DIN EN 13164.

### (3) Required Test Measurements

#### (i) Non-floor Panels

1. Long Term Thermal Resistance:  $R_{LTTR, nf}$

#### (ii) Floor Panels

1. Long Term Thermal Resistance:  $R_{LTTR, fp}$

### 5.3 U-factor of Doors and Display Panels

(a) Follow the procedure in NFRC 100, (incorporated by reference; see § 431.303), exactly, with these exceptions:

(1) The average convective heat transfer coefficient on both interior and exterior surfaces of the door should be based on the coefficients described in section 4.3 of NFRC 100.

#### (2) Internal conditions:

(i) Air temperature of 35 °F (1.7 °C) for cooler doors and -10 °F (-23.3 °C) for freezer doors

(ii) Mean inside radiant temperature must be the same as shown in section 5.3(a)(2)(i), above.

#### (3) External conditions

(i) Air temperature of 75 °F (23.9 °C)

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(ii) Mean outside radiant temperature must be the same as section 5.3(a)(3)(i), above.

(4) Direct solar irradiance = 0 W/m<sup>2</sup> (Btu/h-ft<sup>2</sup>).

### (b) Required Test Measurements

#### (i) Display Doors and Display Panels

1. Thermal Transmittance:  $U_{dd}$

#### (ii) Non-Display Door

1. Thermal Transmittance:  $U_{nd}$

[76 FR 21606, Apr. 15, 2011, as amended at 76 FR 31796, June 2, 2011; 76 FR 33632, June 9, 2011]

## Subpart S—Metal Halide Lamp Ballasts and Fixtures

SOURCE: 74 FR 12075, Mar. 23, 2009, unless otherwise noted.

### § 431.321 Purpose and scope.

This subpart contains energy conservation requirements for metal halide lamp ballasts and fixtures, pursuant to Part A of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6309.

[75 FR 10966, Mar. 9, 2010]

### § 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: Efficiency =  $P_{out}/P_{in}$  where:

(1)  $P_{out}$  equals the measured operating lamp wattage;

(2)  $P_{in}$  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,  $P_{in}$  and  $P_{out}$  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,  $P_{in}$  and  $P_{out}$  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 all units of a given type of covered product (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency, and are rated to operate a given lamp type and wattage.

*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

(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; 74 FR 12074, Mar. 23, 2009]

#### 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