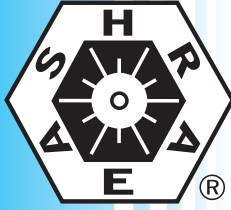


**ANSI/ASHRAE Standard 29-1988 (RA 2005)
Reaffirmation of ANSI/ASHRAE Standard 29-1988 (RA 99)**



ASHRAE STANDARD

Methods of Testing Automatic Ice Makers

This standard was approved by the ASHRAE Standards Committee on January 23, 1999, and reaffirmed June 25, 2005; by the ASHRAE Board of Directors on January 27, 1999, and reaffirmed June 30, 2005; and by the American National Standards Institute on October 14, 1999, and reaffirmed July 1, 2005.

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1791 Tullie Circle NE, Atlanta, GA 30329

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NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at <http://www.ashrae.org>.

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1. PURPOSE AND SCOPE

1.1 Purpose

The purposes of this standard are:

1.1.1 To specify methods and procedures to be used when testing automatic ice makers.

1.1.2 To establish the types of equipment to which the provisions of the standard apply.

1.1.3 To define terms describing the equipment covered and terms related to testing.

1.1.4 To specify type of instrumentation and test apparatus required in testing.

1.1.5 To specify a uniform method for calculation of results.

1.1.6 To specify data and results to be recorded.

1.2 Scope

1.2.1 This standard prescribes the methods of testing automatic ice makers.

1.2.2 The automatic ice maker may comprise one or more sections for shipping purposes.

1.2.3 This standard does not include automatic ice makers installed in household refrigerators, combination refrigerator-freezers, and household freezers.

2. DEFINITIONS

automatic ice-maker: a factory-made assembly (not necessarily shipped in one package) consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice. It may also include means for storing or dispensing ice, or both.

batch-type: an ice maker having alternate freezing and harvesting periods.

blow-down: the dissipation of a certain fraction of water to control the clarity of ice or to prevent scaling.

continuous type: an icemaker that continually freezes and harvests ice at the same time.

3. CLASSIFICATION

3.1 Method of Rejecting Heat

3.1.1 Water-cooled condenser.

3.1.2 Air-cooled condenser.

3.2 Type of Ice Harvested

3.2.1 Ice in irregular shapes of chips, flakes, ribbons, or wafers, as well as uniformly shaped ice of not over approximately 2 oz (56 g).

4. INSTRUMENTS AND APPARATUS

4.1 Test Room

4.1.1 Ambient Temperature. With the ice maker under test at rest, the vertical ambient temperature gradient in any foot (meter) of vertical distance from 2 in. (51 mm) above the floor or supporting platform to a height of 7 ft (2.1 m) or to a height of 1 ft (0.3 m) above the top of the cabinet, whichever is greater, shall not exceed 0.5°F per ft (0.91°C per meter).

4.1.2 Air Circulation. With the ice maker under test at rest, ambient air movement, created by any source external to the unit, shall not impinge upon the air inlet openings with a velocity greater than 50 fpm (0.25 m/s).

4.2 Temperature-Measuring Instruments

4.2.1 Types. Temperature shall be measured with instruments of any type having the specified accuracies at the temperatures of use.

4.2.2 Accuracy and readability each shall be within $\pm 1.0^\circ\text{F}$. (In no case shall the smallest scale division of the temperature-measuring instrument exceed 2°F [1.1°C].)

4.2.3 Where an accuracy closer than $\pm 1.0^\circ\text{F}$ (0.56°C) is specified, the instrument shall be calibrated by comparison with a certified standard in the range of use or shall itself be certified as to accuracy.

4.3 Electrical Instruments

4.3.1 Accuracy and readability each shall be within $\pm 2.0\%$ of the quantity measured.

4.3.2 Input power shall be measured with an integrating watt-hour meter graduated to 0.01 kWh.

4.4 Water Flow-Measuring Instruments

4.4.1 Flow shall be measured by one or more of the following methods having an accuracy and readability each of $\pm 2.0\%$ of quantity measured:

- (a) Liquid quantity, measuring either mass or volume.
- (b) Integrating type liquid flowmeter.

4.5 Ice-Weighing Instruments

4.5.1 Unless otherwise specified, ice made by the ice maker under test shall be weighed on an instrument having an accuracy and readability each of $\pm 1.0\%$ of the quantity measured.

4.5.2 The intercepted ice sample shall be obtained and weighed in one of the following containers of predetermined mass (insulated if desired):

- (a) Perforated pan, bucket, or wire basket.
- (b) Nonperforated pan or bucket.

5. TEST METHODS

5.1 The specified voltage shall be measured at the ice maker service connection, with the ice maker in operation, and shall not vary more than $\pm 2\%$ during the test.

5.2 The temperature of the supply water within conduit shall be measured within 8 in. (203 mm) of the machine by inserting the temperature-measuring instrument directly within the water stream or within a well inserted into the conduit. Water temperature shall be maintained within $\pm 1^\circ\text{F}$ (0.56°C) of the specified temperature.

5.3 For an air-cooled ice maker, ambient temperature shall be measured at a minimum of two places, with the measuring devices centered 1 ft (0.3 m) from the air inlet. Where more than one inlet is provided, a temperature-measuring instrument shall be located at each inlet and the average temperature recorded.