



Standard Specification for Ice Making Machines, Icemaker-Dispensers, and Ice Dispensing Equipment¹

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1. Scope

1.1 This specification covers requirements for commercial automatic ice making equipment. It covers the equipment and devices used in manufacturing and processing ice for human consumption and the attached equipment used in storing and dispensing ice in connection with this equipment.

1.2 This specification does not apply to icemakers of the tray type, ice vending machines, or icemakers and icemaker kits used in household refrigerators or freezers. This specification is not intended to cover block ice manufacturing plants.

1.3 The values stated in inch-pound units are to be regarded as the standard. The SI values given in parenthesis are provided for information only.

2. Referenced Documents

2.1 ASTM Standards:²

A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

A1008/A1008M Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

D3951 Practice for Commercial Packaging

F760 Specification for Food Service Equipment Manuals

F1166 Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities

2.2 ANSI Standard:³

Z1.4 Sampling Procedures and Tables for Inspection by Attributes

2.3 ANSI/UL Standards:⁴

No. 563 UL Standard For Ice Makers

No. 763 UL Standard for Operated Commercial Food Preparing Machines

No. 969 UL Standard for Marking and Labeling Systems

2.4 ARI Standards:⁵

Standard No. 810 Standard for Automatic Commercial Icemakers

Standard No. 820 Standard for Ice Storage Bins

2.5 ASHRAE Standard:⁶

Standard No. 29 Methods of Rating and Testing Ice Makers

2.6 NSF/ANSI Standards:⁷

No. 12 Automatic Ice making Equipment

No. 18 Manual Food and Beverage Dispensing Equipment

2.7 Federal and Military Standards:⁸

MIL-STD-1399/300 Interface Standard For Shipboard Systems Section 300A Electric Power, Alternating Current

¹ This specification is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.03 on Storage and Dispensing Equipment.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁴ Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.

⁵ Available from Air-Conditioning & Refrigeration Institute (ARI) 4100 N. Fairfax Drive, Suite 200 Arlington, VA 22203.

⁶ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

⁷ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

⁸ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

MIL-STD-167/1 Mechanical Vibrations of Shipboard Equipment (Type I—Environmental and Type II—Internally Excited)
 MIL-STD-461 Requirements For the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment

3. Terminology

3.1 Definitions:

3.1.1 Capacity:

3.1.1.1 *ice maker*—quantity of ice produced during a 24-h period at standard rating conditions defined by ARI 810.

3.1.1.2 *ice storage bin*—theoretical amount of ice, which can be contained within an ice storage bin at standard rating conditions defined by ARI 820.

3.1.2 *harvest*—function of removing or separating the manufactured ice from the evaporator.

3.1.3 *remote icemaker*—icemaker intended to be connected to a field-installed condenser located remote from the icemaker.

3.1.4 *self-contained icemaker*—unitary equipment consisting of a complete factory assembled and tested refrigerating system in which all refrigerant-containing parts are permanently connected at the factory.

3.1.5 *unitary icemaker*—equipment consisting of a complete factory assembled and tested refrigeration system comprising one or more assemblies that may be shipped separately but are intended to be used together.

4. Classification

4.1 *General*—Ice machines covered by this specification are classified by types, grades, classes, sizes and styles.

4.2 Type:

4.2.1 *Type I*—Ice machine with or without ice storage bin.

4.2.2 *Type II*—Icemaker-dispenser machine.

4.2.3 *Type III*—Ice dispenser.

4.3 Grade:

4.3.1 *Grade 1*—Air-cooled condenser (self-contained).

4.3.2 *Grade 2*—Water-cooled condenser (self-contained).

4.3.3 *Grade 3*—Remote water-cooled.

4.3.4 *Grade 4*—Remote air-cooled.

4.4 Class:

4.4.1 *Class A*—Cubed ice.

4.4.2 *Class B*—Flaked ice.

4.4.3 *Class C*—Nugget ice.

4.4.4 *Class D*—Other ice shapes.

4.5 Size:

4.5.1 *Cube Ice Makers:*

Ice Maker Size	(lb)	Production Capacity	(kg)
1	100 and under	45.3 and under	
2	101 to 150	45.8 to 68.0	
3	151 to 200	68.5 to 90.7	
4	201 to 250	91.1 to 113.4	
5	251 to 350	113.8 to 158.7	
6	351 to 450	159.2 to 204.1	
7	451 to 550	204.5 to 249.8	
8	551 to 650	249.9 to 294.8	
9	651 to 900	295.2 to 408.2	
10	901 to 1250	408.6 to 566.9	
11	1251 to 1500	567.4 to 680.3	
12	1501 and over	680.8 and over	

4.5.2 *Flake Ice and Nugget Makers:*

Ice Maker Size	(lb)	Production Capacity	(kg)
1	200 and under	90.7 and under	
2	201 to 300	91.1 to 136.0	
3	301 to 400	136.5 to 181.4	
4	401 to 550	181.8 to 249.4	
5	551 to 700	249.9 to 317.5	
6	701 to 1000	317.9 to 453.5	
7	1001 to 1200	454.0 to 544.3	
8	1201 to 2000	544.7 to 907.1	
9	2001 and over	907.6 and over	

NOTE 1—This specification does not purport to address all of the sizes that may be available, but is an overview of the most common sizes used in the industry today (see Appendix X1).

4.6 Style:

4.6.1 *Style I*—Corrosion-resisting steel cabinet.

4.6.2 *Style 2*—Carbon steel cabinet.

4.6.3 *Style 3*—Plastic.

5. Ordering Information

5.1 *Ordering Data*—Purchasers shall select the ice making machines, icemaker-dispensers, and ice dispensing equipment and any preferred options and include the following information in the purchasing document:

5.1.1 Title, number, and date of this specification,

5.1.2 Type, grade, class, size, and style of machine required,

5.1.3 Quantity to be furnished,

5.1.4 Ice storage bin size,

5.1.5 Electrical power supply characteristics: voltage, phase, frequency (see 7.3.1),

5.1.6 Accessory equipment such as water/beverage dispensing heads, spare parts, maintenance parts required, or other options available by the manufacturer, or a combination thereof,

5.1.7 When Federal/Military procurement is required, review and implement the applicable supplementary requirements (see S1.1 through S8.8.3),

5.1.8 When specified, the purchaser shall be furnished certification that samples representing each lot have been either tested or inspected as directed in this specification and the requirements have been met. When specified, a copy of the test results shall be furnished (see 14.1 through 14.3),

5.1.9 Level of preservation and packing required if other than as stated in Practice D3951 (see 17.1), and

5.1.10 Labeling requirements (if different than 15.1).

6. Materials and Manufacture

6.1 *General*—Ice making machines, icemaker-dispensers, and ice dispensing equipment shall conform to NSF/ANSI No. 12. Materials used shall be new and free from defects, or reclaimed and recycled conforming to the same quality standards for new materials.

6.1.1 *Stainless Steel*—Stainless steel shall conform to the 300 series of Specification A167 as applicable.

6.1.2 *Carbon*—Carbon steel sheet or strip shall conform to Specification A1008/A1008M as applicable.

6.1.3 *Ozone-Depleting Compounds*—Type one ozone-depleting compounds shall not be used as a refrigerant or as a component of foam insulation and shall be the manufacturer's standard chemicals.

6.1.4 *Insulation*—Insulation used in construction shall be fabricated to efficiency requirements in accordance with ARI 820.

7. Design and Construction

7.1 *General*—Ice machines shall be the manufacturer's standard product delivered assembled, ready for mounting, connected to electricity and water, and used as applicable.

7.2 The ice machine shall have a means of harvesting and storing ice, a water circulating system, motor or motor drives, and all necessary piping, wiring, control and safety devices, and accessories required to provide an automatic operating ice making machine with automatic control of ice level in storage bin. Storage bins shall be sized accordingly, with respect to production capacities, and be compatible with the ice making machine or icemaker-dispenser. Ice dispensing equipment shall be units with a means of dispensing ice by actuation of a lever or button device. All parts of ice making machines, icemaker-dispensers, and ice dispensing equipment shall be located to permit repair or replacement.

7.2.1 *Exterior Cabinet*—Equipment shall be designed, constructed, and tested to be in compliance with ANSI/UL 563 and NSF/ANSI No. 12 or NSF/ANSI No. 18 as applicable.

7.3 *Electrical Requirements:*

7.3.1 *Nominal Input Power*—Unless otherwise specified (see 5.1.5), the machine shall be designed to operate on one of the following:

7.3.1.1 120 V, 60 Hz, single phase.

7.3.1.2 208 to 230 V, 60 Hz, single phase.

7.3.1.3 208 to 230 V, 60 Hz, three phase.

7.3.1.4 220 to 240 V, 50 Hz, single phase.

7.3.2 *Electrical Motors*—All electric motors shall have bearings that require no additional lubrication.

7.4 *Refrigeration Unit*—The refrigeration unit shall be an integral part of the ice making machine or icemaker-dispenser. The assembled refrigeration unit shall be completely self-contained, completely wired, and completely dehydrated and charged with the proper amount and type of refrigerant and oil necessary for operation. The refrigerating system shall be fitted with a means of recovering and adding refrigerant to the system. The compressor and compressor motor shall be of the type and size to obtain the capabilities listed in 4.5.1 and 4.5.2. Motors shall be protected against damage from overloads and voltage fluctuations when starting or running by means of a thermal overload protector. When 50 Hz frequency is specified, the motor shall be specifically designed for operation on that frequency.

7.5 *Storage Bin*—Storage bins shall be insulated with material as specified in 6.1.4. Bins shall be available in various sizes to meet the storage and usage requirements of associated ice making machines. Bin selection shall be specified in the contract or purchase order (see 5.1.4).