



# Standard Specification for Commercial Coffee Brewers<sup>1</sup>

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## 1. Scope

1.1 This specification covers commercial single cup or batch coffee brewers which are used for brewing coffee in commercial and institutional facilities and does not include residential units. This specification is limited to standard coffee brewers and does not include espresso or specialty coffee drink machines.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

- A36/A36M Specification for Carbon Structural Steel
- A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- A176 Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip
- A276 Specification for Stainless Steel Bars and Shapes
- A366/A366M Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled (Withdrawn 2000)<sup>3</sup>
- D3951 Practice for Commercial Packaging
- F760 Specification for Food Service Equipment Manuals
- F1166 Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities<sup>4</sup>

<sup>1</sup> This test method 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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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

### 2.2 ANSI Standards:<sup>4</sup>

- ANSI B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)
- ANSI Z1.4 Sampling Procedures and Tables for Inspection and Attributes
- ANSI/NSF 4 Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment
- ANSI/UL 197 Commercial Cooking Appliances
- ANSI/UL 1439 Test for Sharpness of Edges on Equipment

### 2.3 National/International Safe Transit Association (NSTA/ISTA) Standard:

- NSTA/ISTA Pre-Shipment Test Procedures

### 2.4 Military Standards:

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

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

- 3.1.1 *brew cycle, n*—the time required to complete and recover from brew event.
- 3.1.2 *brew energy, n*—energy consumed by the coffee brewer during a brew cycle.
- 3.1.3 *brew event, n*—dispensing of one serving or batch volume of coffee starting with the initiation of a brew cycle.
- 3.1.4 *brew volume, n*—the substantive delivered bulk beverage portion specified in ounces or gallons.
- 3.1.5 *coffee brewer, n*—commercial appliances designed to heat and deliver a portion of coffee.
- 3.1.6 *energy save mode, n*—a low power mode different from the ready-to-brew state designed to use less energy while the coffee brewer remains “on.”

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3.1.7 *production capacity, n*—calculated maximum volume of coffee potentially brewed in one full hour.

3.1.8 *ready-to-brew (standby) energy, n*—energy required by the coffee brewer to maintain “ready-to-brew” conditions including energy required to keep the reservoir tank at the brew set temperature.

3.1.9 *recovery time, n*—the time required for the brew volume to be returned to the brew set temperature after a brew event.

3.1.10 *serving temperature, n*—the beverage serving temperature maintained by the Warmer plate(s) or the delivered temperature from Type II coffee brewers.

3.1.11 *warmer energy, n*—the required energy from the warmer to maintain the delivered brew volume at serving temperature.

#### 4. Classification

4.1 *Types*—The coffee brewers covered by this specification shall be one of the following three types, each capable of providing heated potable water combined with coffee ground to produce a finished beverage of varying size and capacity.

4.1.1 *Type I*—Single Cup Coffee Brewer

4.1.2 *Type II*—Batch Coffee Brewer

4.1.3 *Type III*—Urn Coffee Brewer

4.2 *Grade*—Method of supplying water to Coffee Brewer

4.2.1 *Grade A*—Manual Fill (Pour Over)

4.2.2 *Grade B*—Automatic Water Fill (Potable water connection)

4.2.3 *Grade C*—Combination, Manual or Automatic Water Fill

4.3 *Class*—Electrical configuration

4.3.1 *Class 1*—120 V, 60 Hz, 1 phase

4.3.2 *Class 2*—208 V, 60 Hz, 1 phase

4.3.3 *Class 3*—208 V, 60 Hz, 3 phase

4.3.4 *Class 4*—240 V, 60 Hz, 1 phase

4.3.5 *Class 5*—240 V, 60 Hz, 3 phase

4.3.6 *Class 6*—230 V, 50/60 Hz, 1 phase

4.3.7 *Class 7*—400 V, 50/60 Hz, 3 phase

4.3.8 *Class 8*—440 V, 60 Hz, 3 phase

4.3.9 *Class 9*—Other

4.4 *Capacity:*

4.4.1 *Capacity a*—Single Cup, less than 12.1 ozs (357 ml)

4.4.2 *Capacity b*—Small Batch, 12.1 to 128 ozs (357 to 3785 ml)

4.4.3 *Capacity c*—Medium Batch, 128.1 to 256 ozs (3788 to 7570 ml)

4.4.4 *Capacity d*—Large Batch, 256.1 ozs and up (7573 ml)

4.5 *Style:*

4.5.1 *Style I*—Single Brew Head

4.5.2 *Style II*—Multiple Brew Head. When specifying a style II coffee brewer, the number of brew heads on the unit will be specified as well.

#### 5. Ordering Information

5.1 Purchasers should select the Coffee Brewer 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, capacity, and style of machine required (see Section 4).

5.1.3 Labeling requirements (if different from Section 12).

5.1.4 Quantity of coffee brewers to be furnished.

5.1.5 Accessory equipment, spare, and maintenance parts required.

5.1.6 Any special requirements or deviation from this specification.

5.2 The following options should be reviewed, and if desired they should be also be included in the order:

5.2.1 When Federal/Military procurement(s) is involved, refer to the supplemental pages.

5.2.2 When other than manufacturer’s standard, commercial, and domestic packaging is required, specify packaging requirements.

5.2.3 When special or supplemental requirements, or both, such as inspections, options, accessories, modifications, changes for correctional facilities use, additional nameplate data, etc. are required.

5.2.4 When specified, a certification to ensure that samples representing each lot have been either tested or inspected as directed and the requirements have been met. When specified, a copy of the certification and/or test results shall be furnished to the purchaser.

5.2.5 When water hook-up is required a water filter (strainer) shall be specified in the incoming water line as close as possible to the tank or heat exchange. Proper flow shall be indicated by the arrows or working on the water filter.

5.2.6 When hard water is specified a water treatment device shall be specified.

5.2.7 When special holding devices are required guardrails shall be specified.

#### 6. Materials and Manufacture

6.1 Materials used in the construction of the machine shall comply with NSF No. 4 and UL Standard 197. Materials not definitely specified shall be of the quality normally used by the manufacturer in making coffee brewing equipment, providing the completed items comply with all provisions of the standard.

6.2 *Hardware and Fittings*—Unless otherwise specified, all hardware and fittings shall be corrosion-resistant to ASTM A167 or ASTM A176 or suitably processed to resist corrosion in accordance with the manufacturer’s standard practice.

6.3 *Threaded Parts*—All threaded parts shall conform to ANSI B1.1, unless otherwise specified.

#### 7. Physical Properties

7.1 *General*—The coffee brewer shall be an electromechanical device for dispensing potable water over a ground coffee mixture either automatically or upon manual actuation. The coffee and water shall be combined in the single cup packet chamber (Type I) or in a brew basket (Type II, Type III) that

can be removed to discard the mixture and rinsed clean at the end of each brew cycle. The coffee brewer shall be designed to comply with the requirements of ANSI/NSF 4 and ANIS/UL 197. Proof of compliance with ANSI/UL 197 shall be a listing in a third-party certification agency listing book or a certification test report from a nationally recognized testing laboratory acceptable to the purchaser. When specified by the purchaser proof of compliance with ANSI/NSF 4 shall be a listing in a third-party certification agency listing book or a certified test report from a nationally recognized testing laboratory acceptable to the purchaser.

NOTE 1—The third party certification agency may be different than the agency that created the standard.

## 8. Performance Requirements

8.1 When specified, a production model of the coffee brewer of interest shall be tested in accordance with the ASTM Standard Test Method for Commercial Coffee Brewers (WK Item #XXXXXX) for the following items:

8.1.1 Maximum energy input rate.

8.1.2 Preheat energy and time.

8.1.3 Ready-to-Brew energy rate.

8.1.4 Heavy use brewing energy rate and production capacity will be tested by applying the appropriate method specified for Type I and Type II coffee brewers.

## 9. Workmanship, Finish, and Appearance

9.1 *Workmanship*—All components and assemblies of the machine shall be free from dirt and other extraneous material such as burrs, slivers, rough die marks, and tool and grind marks, dents, and cracks. Castings and molded parts, if used, shall be free of sand, fins, pits, blowholes, and sprue(s). External surfaces shall meet the UL 1439 Sharp Edge Test.

NOTE 2—Although 9.1 requires subjective judgments, its inclusion is considered important as a guide in evaluating and manufacturing equipment.

9.2 *Metal Fabrication*—Metal used in the fabrication of the machines shall be free from visually apparent defects. Forming and shearing shall not cause damage to the metal and the metal shall be free from trimming marks.

9.3 *Welding*—The surfaces of parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall be smooth and free from cracks, burn holes, undercuts, or incomplete fusion.

9.4 *Fastening Devices*—Holes punched or drilled shall be free of burrs. Threaded fasteners shall not be broken, cracked,

or stripped and shall be drawn tight. Rivets, when used, shall fill the hole completely and the head shall be in full contact with the surface of the member.

9.5 *Finish*—Machine finishes shall be free from discoloration and stains. Stainless steel shall have a 2B or smoother finish.

## 10. Sampling and Quality Assurance

10.1 *Sampling*—When specified in the contract or purchase order, sampling for inspection should be performed in accordance with ANSI Z1.4.

10.2 Measure and inspect the machines prepared for shipment for performance, safety, and appearance by a qualified quality audit program.

## 11. Certification

11.1 When specified in the purchase order or contract, the purchaser shall be furnished certification that samples representing each lot have been tested or inspected as directed in this specification and the requirements have been met. When specified in the purchase order or contract, a report shall be furnished on this testing and inspection.

## 12. Product Marking

12.1 Each machine shall be provided with identification plate or adjacent plate(s) securely affixed to the item. The plate(s) and its markings shall meet UL 197 requirements for labels on indoor equipment.

## 13. Manuals

13.1 Format and content of applicable manuals shall be as indicated in Specification F760 when specified.

## 14. Packaging and Package Marking

14.1 The complete coffee equipment shall be packaged in accordance with the supplier's standard practice.

14.2 The packaging shall meet the requirements of NSTA Pre-Shipment Test Procedures.

14.3 The package shall be marked showing the name of the product, model number, serial number, and manufacturer's name.

## 15. Keywords

15.1 batch brewer; brewer; brewing; coffee; coffee brewer; single cup; single cup brewer; urn; urn coffee brewer

SUPPLEMENTARY REQUIREMENTS

FEDERAL AND MILITARY PROCUREMENT

The supplementary requirements which follow apply to all Federal and Military procurements. Where provisions of this supplement conflict with the main body, this supplement shall prevail.

**S1. Manual**

S1.1 A manual complying with Specification F760 and its supplement shall be provided.

**S2. First Article Inspection**

S2.1 When required, the first article inspection shall be performed on one unit. The first article may be either a first production item or a standard production item from the supplier's current inventory, provided the item meets the requirements of the standard and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

**S3. Label Plates**

S3.1 Coffee Makers shall be provided with data-name plates and instruction plates.

S3.1.1 *Data-name Plates*—Coffee Makers shall be provided with data-name plates readily visible to the operator during normal operating use and so as to not adversely affect the life and utility of the unit. Plates shall be attached to the front of the unit in such a manner as to meet the applicable National Sanitation Foundation International sanitary requirements for this equipment. In addition to the manufacturer data plate, the plate shall contain the following information, which shall be stamped, engraved, or applied by photosensitive means:

National Stock Number

Government Approved Manual Number

S3.1.2 *Instruction Plate*—An instruction plate shall be made of corrosion-resisting metal and shall be attached to the front of the coffee makers. The instruction plate shall bear instructions for start-up, operation, shut-down, and preventative maintenance.

**S4. Part Identifying Number**

S4.1 The following part identifying numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PINs to be used for items acquired to this document are created as follows:

The following is an example of the PIN for an item in accordance with Specification FXXX-11, type II, class A, style B, size 1:

FXXX-11	1	A	1	A	1	
						Style
						Capacity
						Class—Electrical
						Grade
						Type
						ASTM Number

**S5. Preservation, Packaging and Package Marking**

S5.1 When other than commercial practice or conformance to Practice D3951 is desired, the preservation, packaging and package marking requirements shall be stated in the purchase order or contract.

**S6. Human Factors Criteria**

S6.1 Human factors engineering criteria, principles, and practices, as defined in Practice F1166, shall be used in the design of all coffee makers.

**S7. Manufacturer's Certification**

S7.1 If the manufacturer has successfully furnished the same equipment on a previous contract within the past three years further inspection will not be required. The manufacturer shall certify in writing that the equipment to be furnished is the same as that previously furnished and approved, and that no major design changes have been made to the equipment.

**S8. Naval Shipboard Requirements**

S8.1 *Power Compatibility*—Unless otherwise specified, all types of coffee makers shall operate on nominal 115 Volt, single phase, 60 Hertz, 3-wire alternating current as specified in MIL-STD-1399/300.

S8.2 *Access*—Coffee makers for naval surface vessels shall pass through a 26-in. (660-mm) wide by 66-in. (1676-mm) shipboard hatch without major disassembly. Coffee makers for submarines shall pass through a 25-in. (635-mm) diameter circular hatch without major disassembly. When establishing accessibility requirements, both physical and visual access must be provided along with access for any tools, test equipment or replacement parts needed.

S8.3 *Mounting*—Coffee makers shall be provided with bottom holes for mounting. The frame shall be provided with four symmetrically spaced, drilled or threaded bosses or retaining nuts for this purpose. Mounting bolt size shall be 3/8 in. (9.5 mm) minimum for dresser mounting. Coffee makers shall be provided with four type 300 series stainless steel round legs, each a minimum 1 in. (25.4 mm) in diameter, 4 in. (102 mm) in length, for securing dispenser to dresser.

S8.3.1 *Guardrails*—Coffee Makers for shipboard use shall be furnished with guardrails or other means to prevent decanters from sliding off burners or warmers due to shipboard motion or vibration.

S8.4 *Environmental Suitability*—Coffee makers shall be capable of withstanding ships' vibration and motion. Controls, switches, moving parts, and electrical circuits shall operate

under shipboard conditions without malfunction, binding, excessive looseness, or damage. (See S8.6.3.)

**S8.5 Inclined Operation**—Coffee makers shall operate satisfactorily on surface ships when inclined at an angle of 15° each side of the vertical in each of two vertical planes at right angles to each other, with no spillage of fluid or product. For submarines the angle of inclination shall be 30°.

**S8.6 Quality Assurance Provisions:**

**S8.6.1 EMI Control Tests**—When specified, coffee makers shall be tested by the contractor in accordance with requirements of MIL-STD-461 for surface ships and submarines. The first article or the initial production unit, as applicable, shall be tested. The contractor shall furnish written certification that the equipment meets the requirements of MIL-STD-461. Nonconformance with the requirements specified shall constitute failure of the test.

**S8.6.2 Inclined Operational Test**—The coffee maker shall be bolted to a test platform similar to shipboard installation and inclined at an angle of 15° (30° for submarine dispensers). The

coffee maker shall be filled with 75 % product, then be operated for 60 s each at each side of the vertical in each of two vertical planes at right angles to each other. Any nonconformance with specified requirements of S8.5 shall constitute failure of this test.

**S8.6.3 Shipboard Environmental Test**—When specified, the coffee maker under normal operating conditions, shall be tested in accordance with MIL-STD-167/1, type I equipment. The coffee maker shall be secured to the test machine in the same manner that it will be secured on shipboard. Failure of the machine to perform its function during or after testing, or meeting the requirements of S8.4, shall constitute failure of this test. The government reserves the right to witness all tests of coffee makers procured for naval shipboard use, whether performed by the supplier or an independent testing agency.

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