



# ENERGY STAR® Commercial Coffee Brewers Draft Specification Framework Document August 2014

Please send comments to [coffeebrewers@energystar.gov](mailto:coffeebrewers@energystar.gov) no later than September 5, 2014

## Background

The ENERGY STAR program, managed by the U.S. Environmental Protection Agency (EPA), with support from the U.S. Department of Energy (DOE), serves to identify energy-efficient products currently available to consumers in the marketplace. For each new product category, a unique specification is developed to describe the energy performance requirements that a product must meet to receive the label. This specification process relies on rigorous market, engineering, and energy savings analyses as well as input from industry and other stakeholders. Once a final specification is released and it is determined that a model meets the program requirements through an established third-party certification process, the product brand owners may use the label to identify those models as ENERGY STAR certified.

The ENERGY STAR program follows a set of guiding principles when considering the appropriateness of developing a specification for a new product category. These principles include:

- Significant energy savings can be realized on a national basis.
- Energy efficiency can be achieved through one or more technologies such that qualifying product is broadly available and offered by more than one manufacturer.
- Product performance can be maintained or enhanced with increased energy efficiency.
- Product energy consumption and performance can be measured and verified with testing.
- Purchasers will recover their investment in increased energy efficiency within a reasonable period of time.
- Labeling would effectively differentiate products and be visible for purchasers.

EPA also uses a systematic framework to develop performance specifications that must be met in order to earn the label. This document requests stakeholder clarification on issues key to developing an effective energy efficiency program for commercial coffee brewers.

EPA is committed to helping consumers save money and reduce their environmental impact by identifying products with significant energy savings potential. While the per unit energy savings, based on preliminary data, may be small, commercial coffee brewers present an opportunity for reducing national energy use due to the large installed base and the fact that these products are often left in an “always-on” mode. The total aggregate energy savings and wide distribution across many commercial and institutional operations make commercial coffee brewers a good candidate for the ENERGY STAR program.

This Specification Framework is intended to outline EPA’s initial assessment of commercial coffee brewers for purposes of developing a first draft Version 1.0 specification. Included in this document are EPA’s initial thoughts on terms and definitions, scope, test method, and structure

for efficiency requirements. We structured this framework document to mirror the ENERGY STAR specification structure and at the end of each section included a series of questions aimed at generating discussion about the proposed approach and furthering EPA's understanding of this product category. Please note that this document is not intended to be a comprehensive review of the ENERGY STAR perspective on commercial coffee makers. Rather, this framework serves as a starting point for EPA's specification development efforts.

## I. Definitions

- A. Purpose:** Each product specification has its own set of terms and definitions that explicitly describes the products covered by the specification. In this case, we are looking for feedback on ways to clearly differentiate between the different coffee brewer types. We also provide definitions for covered and non-covered products, metrics, and sub-classes of products as needed
- B. Approach:** EPA prefers to make use of existing, industry accepted definitions; however, where definitions are not available or appropriate, EPA works with stakeholders to amend or develop acceptable definitions. *\*Note: Some proposed definitions and portions of the proposed definitions in Section II.C, below, are based on previous correspondence with industry representatives and manufacturer literature.*
- C. List of Proposed Definitions:**
- 1. Commercial Coffee Brewers:** Commercial appliances designed to heat water and brew coffee.<sup>1</sup>
  - 2. Residential Coffee Brewers:** Residential appliances designed to heat water and brew coffee.

### **Commercial Coffee Brewer Products**

- 3. Type I:** A single serving commercial coffee brewer designed to use brewer-specific single-use packages of pre-ground coffee and has a standard brew volume of 6 to 12 fluid ounces per brew event.
- 4. Type II:** A batch commercial coffee brewer designed to use loose, ground coffee and a single-use paper coffee filter, and has a standard brew volume of 64 to 384 fluid ounces per brew event.
- 5. Type III:** An urn or satellite commercial coffee brewer and has a standard brew volume of 384 fluid ounces or greater per brew event.
- 6. Warming Plate:** A heated metal plate intended to hold a non-insulated coffee decanter at optimal serving temperature after a brew event. *\*Note: Warming plates are typically used with Type II brewers.*
- 7. Bean-to-Cup:** Single serving commercial coffee brewers designed to automatically measure and grind whole coffee beans prior to a brew event.

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<sup>1</sup> American Society for Testing and Materials (ASTM) Standard F-2990-12 *Standard Test Method for Commercial Coffee Brewers*.

8. **Espresso Machines:** Machines that prepare single servings of espresso coffee through high-pressure steam.
9. **Satellite Coffee Brewers:** Bulk commercial coffee brewers that brew into large, removable vessels without internal heating elements. May include a separate heated docking station for remote use.
10. **Urn Coffee Brewers:** Bulk commercial coffee brewers that brew into large, self-contained, insulated warming vessels with internal heating elements to maintain product temperature.

**Note:** The Type I, Type II, and Type III commercial coffee brewer definitions were derived from the ASTM F-2988-12, *Standard Specification for Commercial Coffee Brewers*, Section 4: Classification. However, the above proposed definitions for each classification were developed using several industry resources, including manufacturer product literature.

### ***Modes of Operation and Metrics***

11. **Heavy-Use Brew:** The process in which the maximum brew volume is prepared during a brew event.
12. **Heavy-Use Brew Energy Rate:** The average rate of the coffee brewer energy consumption during a brew cycle.
13. **Ready-to-Brew Idle:** The machine is maintaining or holding at a stabilized ready-to-brew operating condition and/or temperature. Also called standby energy rate.
14. **Ready-to-Brew Idle Energy Rate:** The average rate of the coffee brewer energy consumption while it is maintaining or holding at a stabilized ready-to-brew operating condition or temperature. Also called standby energy rate.
15. **Energy Save Mode:** An optional low power mode (different from the ready-to-brew state) that is designed by the manufacturer to use less energy while the coffee brewer remains “on.”<sup>2</sup> This is an optional idle energy rate used for reporting purposes only.

### ***Other Relevant Terms***

16. **Average Tank Temperature:** The average temperature of the water held in the reservoir tank during ready-to-brew idle and energy save mode conditions.
17. **Brew Event:** The sequence of brewing a single-cup (*Type I*) or batch (*Type II*) of coffee, starting with the initiation of a brew event by the user, and including the time needed for the machine to recover to a “ready-to-brew” state.<sup>3</sup>
18. **Brew Volume:** The substantive beverage portion delivered during a single brew

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<sup>2</sup> ASTM Standard F-2990-12 *Standard Test Method for Commercial Coffee Brewers*.

<sup>3</sup> ASTM Standard F-2990-12 *Standard Test Method for Commercial Coffee Brewers*.

event, and specified in fluid ounces or gallons.<sup>4</sup>

### **Certification Terms**

- 19. Product Family:** Individual models offered within a product line with identical designs, including brew capacity and number of warming plates, as applicable. Acceptable differences within a product family for purposes of certification include: controls, method of water delivery (i.e., manual, automatic, or combination), and any aesthetic additions that have no impact on coffee brewer energy consumption while in operation or otherwise.

**Note:** In an effort to reduce testing burden and reflect how products are marketed, EPA often provides a product family certification option which allows for the listing of several model variations under a tested, representative model. In providing this option, it is important that end users experience the energy-efficient performance promised by the ENERGY STAR mark regardless of the model chosen within that product family. As such, EPA is seeking input on acceptable and unacceptable differences in product design, for added clarity.

### **D. Discussion Questions:**

1. Are the proposed capacities per brew event listed in Section C.3-5, for brewer Type's I, II, and III, reasonable and representative? Should other ranges of brew capacities be identified for purposes of delineating the product types?
2. The ASTM test method states that typically, Type I brewers have a standard brew volume of 6 – 8 oz. In this Framework, EPA provided a small buffer, expanding the Type I volume range to 12 oz. In an effort to delineate between Type I and Type II brewers, EPA is considering closing the gap between the maximum volume for Type I and the minimum volume for Type II. Is there an overlap in terms of brew volume between the two types?
3. Are there other types of products that meet the definition of commercial coffee brewers that are not identified in this document that EPA should be made aware of? Are there other ways in which EPA can further delineate between residential and commercial coffee brewers within the definitions provided?
4. Are all modes of operation for Type I and Type II brewers identified and appropriately defined? Are there alternative energy saving modes that are not defined in this document?
5. Are there additional features that do not have an impact on energy performance that are not listed in the proposed product family definition and should be identified?

## **II. Eligible Products**

- A. Purpose:** In each product specification, EPA identifies specific product categories to be covered by the specification. It is also important for the program to identify product types that are **not** eligible for ENERGY STAR qualification for reasons such as: inability to be tested with the identified test method, proprietary technologies, and limited availability of

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<sup>4</sup> ASTM Standard F-2990-12 *Standard Test Method for Commercial Coffee Brewers*.

efficiency data or inability to differentiate based on a product's efficiency.

**B. Approach:** EPA's intention for a Version 1.0 specification is to cover only those coffee brewers intended for commercial use. The scope of the ASTM F-2990-12 test method is currently only applicable to Type I and Type II commercial coffee brewers, as interpreted in the proposed definitions in this document. EPA acknowledges that there are large potential savings associated with the other types of commercial coffee brewers but absent a vetted test method and robust test data set, EPA is limiting the scope of this specification at this time. Longer term, EPA plans to expand the scope to include these products in a next version of this specification if such product categories are added to ASTM F-2990-12, or other applicable test methods are developed.

**C. Included Products:**

1. Type I
2. Type II

**Note:** To further delineate scope of the Version 1.0 specification, EPA is considering a requirement that all coffee brewers be certified to NSF/ANSI Standard 4, *Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment*. This approach has been successfully applied in other ENERGY STAR Commercial Food Service (CFS) specifications and would ensure that any eligible brewer is intended for commercial use only.

**D. Excluded Products:**

1. Type III
  - a. Satellite brewers
  - b. Urn brewers
2. Bean-to-Cup brewers
3. Espresso machines

**E. Discussion Questions:**

1. Are the proposed included and excluded products and their corresponding definitions understandable and clear, such that there is no confusion over intended scope?

**III. Energy Efficiency Criteria**

**A. Purpose:** Once it has been determined which products are eligible, the next step is to identify the performance metrics and set criteria for energy efficiency performance. The efficiency metrics referenced by the product specification must be based on widely accepted test procedures for determining qualification for ENERGY STAR labeling. In general, EPA sets requirements such that only the most efficient products currently available in the market are eligible to qualify. Typically this represents the top quartile of energy-efficient products. By recognizing the approximately top quartile most energy-efficient commercial models available in the U.S. market, EPA distinguishes these products from standard product offerings, thereby adding to their intrinsic value.

**B. Approach:** EPA is considering setting energy efficiency criteria using the following metrics:

1. heavy-use brew rate, and
2. ready-to-brew idle rate.

However, EPA is also interested in identifying and incentivizing power management features, such as manual or automatic low energy mode options. Additional features that may inherently increase energy consumption, such as the number of warming plates, will also be taken into consideration in setting levels if data is supportive.

To a large degree, EPA uses manufacturer data to set energy efficiency levels. A robust data set that shows significant product differentiation with regards to energy efficiency is critical for EPA to develop a Version 1.0 specification. In the event that a more complete data set doesn't indicate that the savings are as substantial as the preliminary data suggests, EPA may decide to reduce scope, or cease development of the specification at this time.

**C. Data Assembly:** EPA is currently working with Pacific Gas & Electric's Food Service Technology Center (FSTC) to expand the existing Type I and Type II commercial coffee brewer data sets. **EPA encourages manufacturers to continue to conduct independent testing to supplement the efforts of the FSTC.** Manufacturers interested in having their products tested at the FSTC are encouraged to contact David Zabrowski, Fisher Nickel, Inc. for testing information. In an effort to release a Draft 1 specification in September manufacturers are encouraged to provide data to EPA, using the ASTM test method, by September 5, 2014.

**D. Discussion Questions:**

1. EPA is interested in suggestions on how types of products might be best binned for fair efficiency comparison.
2. Do stakeholders agree with the heavy-use brew rate and ready-to-brew idle rate metrics as two key requirements used to determine qualified products? Are there other criteria that EPA should consider based on the ASTM F-2990-12 test method?
3. What, if any, power management features are manufacturers incorporating into current product designs? Are there any energy saving features being considered for future designs? How might EPA incentivize manufacturer efforts? Is there data that supports the energy saving potential of engaging these features?

#### IV. Test Method

**A. Purpose:** Product testing has two important roles: to yield accurate and repeatable energy consumption values for establishing ENERGY STAR levels, and to certify and verify labeled products are performing at the appropriate levels and delivering on ENERGY STAR's promise to consumers.

**B. Applicability:** To EPA's knowledge, the ASTM F-2990-12, *Standard Test Method for Commercial Coffee Brewers* is the only industry-accepted, well-vetted test procedure for commercial coffee brewers. The applicability of this test method is intended for Type I and Type II brewers that meet the commercial coffee brewer definition.

**Note:** EPA is interested in learning of any other industry accepted test methods applicable to commercial coffee brewers for included and excluded product types that should be reviewed and considered during this specification development process.

## V. Effective Date

- A. Timeline:** Following this Specification Framework, EPA anticipates releasing a Draft 1 specification in September –October 2014, though that is primarily dependent on how much energy performance data EPA assembles. At this early stage in the specification development process, the effective date is not known, but EPA would like to complete the development process and have this specification be available for certification in early 2015. EPA will remain in close contact with stakeholders throughout this process.

### Next Steps

EPA welcomes written comments from stakeholders on the issues presented above through Friday September 5, 2014. Please send all comments and supporting information to [coffeebrewers@energystar.gov](mailto:coffeebrewers@energystar.gov). ENERGY STAR representatives are available for any questions or additional discussions throughout the specification development process. Please contact Christopher Kent, EPA, at (202) 343-9046 and [Kent.Christopher@epa.gov](mailto:Kent.Christopher@epa.gov) or Adam Spitz, ICF International, at (202) 862-1226 and [Adam.Spitz@icfi.com](mailto:Adam.Spitz@icfi.com).

Below are some broad estimates on the Commercial Coffee Brewers specification development process timeline.

Coffee Brewers Launch Letter	March 10, 2014
Coffee Brewers Stakeholder meeting	May 19, 2014
Coffee Brewers Framework document to stakeholders	Monday August 4, 2014
<b>Deadline for Written Comments on Framework document</b>	<b>Friday September 5, 2014</b>
Draft 1 Version 1.0 Specification to stakeholders	September-October 2014
Draft 1 Version 1.0 Specification comments due to EPA	Fall 2014
Draft 2 Version 1.0 Specification to stakeholders	Late Fall 2014 – early Winter 2015
Draft 2 Version 1.0 Specification comments due to EPA	Winter 2015
Final Draft Version 1.0 Specification to stakeholders	early Spring 2015
Final Draft Version 1.0 Specification comments due to EPA	Spring 2015
Final Version 1.0 Specification	Spring-Summer 2015

Please note that these dates are estimates and the final schedule is dependent on a variety of factors such as delays in the dataset assembly period, changes in scope, etc. Given these caveats, this represents our initial thoughts on the timing of this specification development process.