ENERGY STAR® Program Requirements Product Specification for Uninterruptible Power Supplies (UPSs)

Eligibility Criteria Draft 3 Version 1.0

Following is the Version 1.0 ENERGY STAR Product Specification for Uninterruptible Power Supplies (UPSs). A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1 DEFINITIONS

Unless otherwise specified, all terms used in this document are consistent with the definitions in the International Electrical Commission (IEC) standard IEC 62040-3[1].

For the purpose of this specification the following definitions apply:

A) Uninterruptible Power Supply (UPS): Combination of convertors, switches, and energy storage devices (such as batteries) constituting a power system for maintaining continuity of load power in case of input power failure.[2]

1) Power conversion mechanism:

i) Static UPS: UPS where solid-state power electronic components provide the output voltage.

ii) Rotary UPS: UPS where one or more electrical rotating machines provide the output voltage.

2) Power Output:

i) Alternating Current (Ac)-output UPS: UPS that supplies power with a continuous flow of electric charge that periodically reverses direction.

ii) Direct Current (Dc)-output UPS/Rectifier: UPS that supplies power with a continuous flow of electric charge that is unidirectional. Includes both individual rectifier units for dc applications and entire dc-output UPS frames or systems, consisting of rectifier modules, controllers, and any other supporting components.

Note: Dc-output UPSs are also known as rectifiers. A rectifier is a product that converts alternating current to direct current to supply a load and an energy storage mechanism. For the purposes of this document, the term “Dc-output UPS/Rectifier” is used because a “rectifier” may also refer to an ac-output UPS component.

Note: To avoid confusion, EPA removed the following terms referring to application of the UPS: "Consumer UPS," “Commercial UPS,” "Data Center UPS," “Industrial UPS,” “Cable TV UPS,” “Safety UPS,” and “Utility UPS” from Section 1 of this Draft 3 specification since the minimum average efficiency requirements remain based solely on output power and not application. The qualification criteria in Section 3 no longer reference terms related to application. Where application is relevant to the scope of the specification, EPA has included additional descriptions of included and excluded products in Section 2.

1 International Electrotechnical Commission (IEC). IEC standard 62040-3. “Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements.” Ed. 2.0

2 Input power failure occurs when voltage and frequency are outside rated steady-state and transient tolerance bands or when distortion or interruptions are outside the limits specified for the UPS.

B) Modular UPS: A UPS comprised of two or more single UPS units, sharing one or more common frames and a common energy storage system, whose outputs, in normal mode of operation, are connected to a common output bus contained entirely within the frame(s). The total quantity of single UPS units in a modular UPS equals "n + r" where n is the quantity of single UPS units required to support the load; r is the quantity of redundant UPS units. Modular UPSs may be used to provide redundancy, to scale capacity or both.

C) Redundancy: Addition of UPS Units in a parallel UPS to enhance the continuity of load power, and classified as follows.

1) N + 0: UPS that cannot tolerate any failures while maintaining Normal Mode operation. No redundancy.

2) N + 1: Parallel UPS that can tolerate the failure of one UPS unit or one group of UPS units while maintaining Normal Mode operation.

3) 2N: Parallel UPS that can tolerate the failure of one half of its UPS units while maintaining Normal Mode operation.

D) UPS Operational Modes:

1) Normal Mode: Stable mode of operation that the UPS attains under the following conditions:

i) Ac input supply is within required tolerances and supplies the UPS.

ii) The energy storage system remains charged or is under recharge.

iii) The load is within the specified rating of the UPS.

iv) The bypass is available and within specified tolerances (if applicable).

2) Stored Energy Mode: Stable mode of operation that the UPS attains under the following conditions:

i) Ac input power is disconnected or is out of required tolerance.

ii) All power is derived from the energy storage system.

iii) The load is within the specified rating of the UPS.

3) Bypass Mode: Mode of operation that the UPS attains when operating the load supplied via the bypass only.

E) UPS Input Dependency Characteristics:

1) Voltage and Frequency Dependent (VFD): Capable of protecting the load from power outage.[3]

2) Voltage Independent (VI): Capable of protecting the load as required for VFD, above, and in addition from:

i) Under-voltage applied continuously to the input

ii) Over-voltage applied continuously to the input[4]

3) Voltage and Frequency Independent (VFI): Independent of voltage and frequency variations and capable of protecting the load against adverse effects from such variations without depleting the stored energy source.

3 The output of the VFD UPS is dependent on changes in Ac input voltage and frequency and is not intended to provide additional corrective functions, such as those arising from the use of tapped transformers.

4 An output voltage tolerance band narrower than input voltage window shall be defined by the manufacturer. The output of the VI UPS is dependent on Ac input frequency and the output voltage shall remain within prescribed voltage limits (provided by additional corrective voltage functions, such as those arising from the use of active and/or passive circuits).

4) Single-normal-mode UPS: A UPS that functions within the parameters of only one set of input dependency characteristics. For example, a UPS that functions only as VFI.

5) Multiple-normal-mode UPS: A UPS that functions within the parameters of more than one set of input dependency characteristics. For example, a UPS that can function as either VFI or VFD.

Note: EPA has also revised the terms “Single-Mode UPS” and “Multi-Mode UPS” to “Single-normal-mode UPS” and “Multiple-normal-mode UPS” in an effort to more accurately reflect the nuances of testing UPSs with multiple normal modes. Since three different modes are defined ("Normal Mode," "Stored Energy Mode," and "Bypass Mode") the previous term “Multi-mode UPS” could have been misinterpreted as referring to a UPS able to operate in Normal, Stored, and Bypass Mode—i.e., most every UPS.

F) Other Terms:

1) Bypass: Power path alternative to the ac converter.

a) Maintenance bypass (path): Alternative power path provided to maintain continuity of load power during maintenance activities.

b) Static bypass (electronic bypass): Power path (primary or stand-by) alternative to the indirect ac converter where control is via an electronic power switch, for example transistors, thyristors, triacs or other semiconductor device or devices.

G) Reference Test Load: Load or condition in which the output of the UPS delivers the active power (W) for which the UPS is rated.

Note: A footnote associated with the definition of Reference Test Load previously permitted the UPS output to be backfed into the input ac supply. One stakeholder noted that while back-feeding into the power supply should be encouraged during actual operation when able to do so safely and within local regulations, it is does not qualify as a viable load for testing purposes. Although this footnote had been drawn from IEC 62040-3, the purpose of the definitions in the ENERGY STAR program requirements is more limited. EPA will therefore remove the footnote to avoid confusion, as the intention of the program is to test with a resistive load.

H) Unit Under Test (UUT): The UPS undergoing the test, configured as though for shipment to the customer, and including any accessories (e.g., filters or transformers) necessary to meet the test setup as specified in section 4 of the ENERGY STAR test method.

I) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject to the same ENERGY STAR qualification criteria, and (3) of a common basic design. For UPSs, product families consist of product models that meet the definition of Modular UPS as specified herein. For UPSs, acceptable variations within a product family include:

1) Number of installed modules;

2) Redundancy;

3) Input and output filters; and

4) Number of rectifier poles.

J) Acronyms:

1) A: Ampere

2) ac: Alternating Current

3) dc: Direct Current

4) THD: Total Harmonic Distortion

5) UPS: Uninterruptible Power Supply

6) UUT: Unit Under Test

7) V: Volt

8) VFD: Voltage and Frequency Dependent

9) VFI: Voltage and Frequency Independent

10) VI: Voltage Independent

11) W: Watt

12) Wh: Watt-hour

2 SCOPE

2.1 Included Products

2.1.1 Products that meet the definition of an Uninterruptible Power Supply (UPS) as specified herein including Static and Rotary UPSs and Ac-output UPSs and Dc-output UPSs/Rectifiers are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.2. Products eligible for qualification under this specification include:

i) Consumer UPSs intended to protect desktop computers and related peripherals, and/or home entertainment devices such as TVs, set top boxes, DVRs, Blu-ray and DVD players;

ii) Commercial UPSs intended to protect small business and branch office information and communication technology equipment such as servers, network switches and routers, and small storage arrays;

iii) Data Center UPSs intended to protect large installations of information and communication technology equipment such as enterprise servers, networking equipment, and large storage arrays; and,

iv) Telecommunications Dc-output UPSs/Rectifiers intended to protect telecommunication network systems located within a central office or at a remote wireless/cellular site.

Note: EPA has included further clarification of the scope of included dc-output UPSs/Rectifier products.

2.2 Excluded Products

2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible for qualification under this specification. The list of specifications currently in effect can be found at www.energystar.gov/products.

2.2.2 The following products are not eligible for qualification under this specification:

i) Products that are internal to a computer or another end-use load (e.g., battery-supplemented internal power supplies or battery backup for modems, security systems, etc.);

ii) Industrial UPSs specifically designed to protect industrial manufacturing processes and operations;

Note: Based on stakeholder feedback, EPA has removed "rough handling and abusive environments" to eliminate ambiguity from the description of UPSs designed specifically for industrial applications.

iii) Utility UPSs designed for use as part of electrical transmission and distribution systems (e.g. electrical substation or neighborhood level UPSs);

iv) Cable TV (CATV) UPSs designed to power the cable signal distribution system outside plant equipment and connected directly or indirectly to the cable itself. The "cable" may be coaxial cable (metallic wire) type or fiber-optic or wireless (e.g., "Wi-Fi"); and,

v) UPSs designed to comply with specific UL safety standards for safety-related applications, such as emergency lighting, operations or egress, or medical diagnostic equipment.

3 QUALIFICATION CRITERIA

3.1 Significant Digits and Rounding

3.1.1 All calculations shall be carried out with directly measured (unrounded) values.

3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.

3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

3.2 Energy Efficiency Requirements for Ac-output UPSs

3.2.1 Single-normal-mode UPSs: Average loading-adjusted efficiency (Eff_{AVG}), as calculated per Equation 1, shall be greater than or equal to the Minimum Average Efficiency Requirement (Eff_{AVG_MIN}), as determined per Table 2, for the specified output power and input dependency characteristic, except as specified below.

i. For products with output power greater than 10 kW and communication and measurement capability, as specified in Section 3.7, average loading-adjusted efficiency (Eff_{AVG}), as calculated per Equation 1, shall be greater than or equal to the Minimum Average Efficiency Requirement (Eff_{AVG_MIN}), as determined per Table 3, for the specified input dependency characteristic.

Equation 1: Calculation of Average Efficiency for Ac-output UPSs

$$Eff_{AVG} = t_{25\%} \times Eff|_{25\%} + t_{50\%} \times Eff|_{50\%} + t_{75\%} \times Eff|_{75\%} + t_{100\%} \times Eff|_{100\%}$$

Where:

- Eff_{AVG} *is the average loading-adjusted efficiency,*
- $t_{n\%}$ *is the proportion of time spent at the particular n% of the reference test load, as specified in the loading assumptions in Table 1.*
- $Eff|_{n\%}$ *is the efficiency at the particular n% of the reference test load, as measured according to the test method.*

Table 1: Ac-output UPS Loading Assumptions for Calculating Average Efficiency

Output Power, P, in kilowatts (kW)	Proportion of Time Spent at Specified Proportion of Reference Test Load, $t_{n\%}$			
	25%	50%	75%	100%
P ≤ 1.5 kW	0.2	0.2	0.3	0.3
1.5 kW < P ≤ 10 kW	0	0.3	0.4	0.3
P > 10 kW	0.25	0.50	0.25	0

Note: EPA received numerous comments from stakeholders concerning changes to the proposed loading profiles in Table 1, some asking that they emphasize lower loading points and others that higher points receive greater weighting. EPA has not changed the loading profiles, as there is not enough data to indicate a shift in either direction. The current weightings provide a level playing field for UPSs in each power category, allowing for fair comparisons of products. A major goal of future versions of this specification will be to increase the accuracy of these loading profiles.

Based on data submitted by manufacturers, EPA has found that use is correlated with output power and will therefore continue to use output power divisions for the Table 1 loading assumptions. However, EPA acknowledges that not all UPSs with a particular output power will be used in the same way (e.g., consumer versus commercial applications). To avoid confusion, EPA will remove the terms "Consumer", Commercial" and "Data Center" from the definitions section and tables describing requirements and usage profiles. EPA believes that a given loading profile reasonably represents the typical or average use case for each output power classification.

This approach is more straightforward for establishing efficiency levels and conveying product qualification to end users and avoids delineating product efficiency through an explicitly assumed end-use. EPA has also reviewed suggestions for categorizing UPSs based on connector ratings and radiated emissions but considers these too particular and potentially inconsistent with previous classification efforts (e.g., the EU Code of Conduct) which have relied on commonly reported characteristics such as output power and voltage. Lastly, EPA supports any industry-led efforts to survey UPS utilization to inform future specification revisions and appreciates the suggestion of developing a platform for the collection of efficiency and utilization data. However, until further data are available, EPA will retain the Draft 2 proposed loading profile.

Table 2: Ac-output UPS Minimum Average Efficiency Requirement

Minimum Average Efficiency Requirement ($Eff_{AVG\ MIN}$), Where: **• P is the Output Power in watts (W), and** **• ln is the natural logarithm.**			
	Input Dependency		
Output Power	**VFD**	**VI**	**VFI**
P ≤ 1500 W	0.97		$0.0099 \times \ln(P) + 0.805$
1500 W < P ≤ 10,000 W	0.97	0.96	
P > 10,000 W	0.97	0.95	

Note: After receiving suggestions from stakeholders to revise the VFI level for the ≤ 1500 W range, EPA conducted a market study to determine if UPSs with different dependency characteristics are marketed to different customers. The market survey revealed significant price differences between (for example) VFD and VFI units of the same output power. The significant differences in load protection capabilities between different input dependencies, along with their price differences, has led EPA to revise the VFI requirement in Table 2. The minimum average efficiency shall now be greater than or equal to $0.0099 \times \ln(P) + 0.805$ for all VFI products regardless of output power (P). EPA believes that restoring the VFI category to a logarithmic line fit in the ≤ 1500 W range is sufficient to allow different end-uses to be accurately captured without the addition of extra categories or more complex definitions. EPA has retained the VI and VFD levels for those UPSs with output power ≤ 1500 W.

The current levels in Table 2 represent the top 25-30% of models. A preliminary investigation of the cost effectiveness of purchasing an ENERGY STAR labeled unit over a non-ENERGY STAR unit has found annual unit savings ranging from $5/year for the smallest VFD units to between $5,000 and $14,000/year for the larger VFI units. The levels also ensure that a wide selection of ENERGY STAR qualified UPSs will be available to consumers from a variety of manufacturers.

Table 3: Ac-output UPS Minimum Average Efficiency Requirement for Products with Metering and Communications Capability

Minimum Average Efficiency Requirement ($Eff_{AVG\ MIN}$), Where: • P is the Output Power in watts (W), and • ln is the natural logarithm.			
	Input Dependency		
Output Power	**VFD**	**VI**	**VFI**
P > 10,000 W	0.95	0.93	$0.0099 \times \ln(P) + 0.785$

Note: EPA is proposing a credit of 2% for communications and measurement. Please see Section 3.7.

3.2.2 Multiple-normal-mode UPSs: Average loading-adjusted efficiency (Eff_{AVG}), as calculated per Equation 2, shall be greater than or equal to the Minimum Average Efficiency Requirement (Eff_{AVG_MIN}), as determined per Table 2, for the specified output power and lowest-input dependency mode provided by the Multiple-normal-mode UPS.

i. Multiple-normal-mode UPS systems shall ship with their highest-input dependency mode enabled by default.

Equation 2: Calculation of Average Efficiency for Multiple-normal-mode Ac-output UPSs

$$Eff_{AVG} = 0.75 \times Eff_1 + 0.25 \times Eff_2$$

Where:

- *Eff_{AVG} is the average loading-adjusted efficiency,*
- *Eff_1 is the average loading-adjusted efficiency in the lowest-input dependency mode (i.e., VFI or VI), as calculated per Equation 1.*
- *Eff_2 is the average loading-adjusted efficiency in the highest-input dependency mode (i.e., VFD), as calculated per Equation 1.*

Note: EPA received additional stakeholder comments on the inclusion and weighting of Multiple-normal-mode UPSs. After consideration of all stakeholder inputs, EPA has maintained the same position as in Draft 2—Multiple-normal-modes are one of several innovative strategies for realizing energy savings in UPS systems, but the amount of time these modes are used is still an open question. The weightings above reflect a balance of the above concerns.

3.3 Energy Efficiency Requirements for Dc-output UPSs/Rectifiers

3.3.1 Average loading-adjusted efficiency (Eff_{AVG}), as calculated per Equation 3, shall be greater than or equal to the Minimum Average Efficiency Requirement (Eff_{AVG_MIN}), as determined per Table 4. This requirement shall apply to complete systems and/or individual modules. Manufacturers can qualify either, subject to the following requirements:

i. Complete systems that are also modular shall be qualified as Modular UPS Product Families with a particular model of module installed,

ii. Qualification of individual modules will have no bearing on the qualification of modular systems unless the entire systems are also qualified as specified above.

Note: EPA proposes that dc-output UPS manufacturers have the option to qualify both systems and/or individual modules. A single module could be tested and qualified without the system and then be sold individually with the ENERGY STAR label, allowing vendors to market highly efficient replacement modules for legacy systems.

For a complete dc-output UPS system to receive the ENERGY STAR label, EPA proposes that the vendor specify exact module models tested in the following configurations:

1. Minimum output power non-redundant configuration as typically shipped to the user (e.g., system with a single rectifier module installed)

2. Maximum output power non-redundant configuration as typically shipped to the user (e.g., system with all the modules installed)

EPA proposes that the system meet the eligibility criteria in <u>both</u> configurations. Under this proposal, qualified systems would not be marketed or sold with module models different than those tested.

Equation 3: Calculation of Average Efficiency for All Dc-output UPSs

$$Eff_{AVG} = \frac{Eff|_{30\%} + Eff|_{40\%} + Eff|_{50\%} + Eff|_{60\%} + Eff|_{70\%} + Eff|_{80\%}}{6}$$

Table 4: Dc-output UPS/Rectifier Minimum Average Efficiency Requirement

Minimum Average Efficiency Requirement ($Eff_{AVG\ MIN}$)
0.955

3.4 Power Factor Requirements

3.4.1 The measured power factor shall meet the minimum level specified in Table 5.

Table 5: UPS Minimum Power Factor Requirement

Minimum Power Factor Requirement
0.90

Note: EPA analyzed available data and determined that units for which manufacturers shared test data had an average power factor of 0.98. Based on stakeholder feedback, EPA has implemented a minimum power factor of 0.90 that ensures ENERGY STAR qualified UPS products will meet the needs of diverse stakeholders while simultaneously avoiding the disqualification of large numbers of products that are otherwise energy efficient. EPA welcomes stakeholder feedback on this proposal.

3.5 Toxicity and Recyclability/Recycled Content Requirements

Note: It is EPA's understanding that UPS systems are excluded from the RoHS requirement, the only known standard for toxicity in electronics. As such, EPA will forgo addressing such requirements in this version of the specification.

3.6 Standard Information Reporting Requirements

3.6.1 A standardized Power and Performance Data Sheet (PPDS) shall be completed for each ENERGY STAR qualified UPS or Product Family and posted with other product information on the Partner's website.

Note: The PPDS for UPS products is still under development but a draft form has been released for review and comments from stakeholders. The draft PPDS is based in part on Table D.1 in IEC 62040-3 Ed. 2.0.

3.6.2 Templates for the PPDS can be found on the new ENERGY STAR product specification development web page for Uninterruptible Power Supplies at http://www.energystar.gov/index.cfm?c=new_specs.uninterruptible_power_supplies. The PPDS contains the following information:

i. General characteristics (e.g., manufacturer, model number, UPS configuration, input/output electrical characteristics, physical dimensions);

ii. Average efficiency used for qualification;

iii. Efficiency at each loading point as well;

iv. Communication and measurement;

v. Battery/stored energy device characteristics; and

vi. Recycling and other environmental information.

Note: EPA has received multiple comments on the draft PPDS form circulated with the Draft 2 specification. Although many stakeholders asked EPA to remove detail from the form, EPA balanced these concerns against the need to provide relevant information to purchasers to influence purchasing decisions in favor of energy efficiency. The resultant form maintains some detail not directly related to energy efficiency (e.g., physical dimensions) but eliminates subjective information (e.g., battery lifetime) and direct references to IEC 62040-3 that was the focus of stakeholder concerns.

3.6.3 EPA may periodically revise this template, as necessary, and will notify Partners of the revision process. Partners should always use the most recent version of the data sheet posted to the ENERGY STAR website.

3.7 Communication and Measurement Requirements

Note: Both EPA's ENERGY STAR Products and Buildings teams have received numerous comments from stakeholders at webinars and in writing on the subject of UPS metering. The intent of proposed metering language in this specification is to provide end-users with the means to more accurately monitor their data center energy consumption, calculate their PUE, and have the option to participate in the ENERGY STAR Buildings labeling program.

Measuring and tracking the energy consumption of the data center is an important means for effective management. ENERGY STAR's free Portfolio Manager Tool, www.energystar.gov/benchmark, enables data center operators to assess their energy performance relative to peers using a 1-100 scoring system, as well as track changes in energy use over time. ENERGY STAR encourages the installation of energy (kWh) meters at the output of the UPS.

A variety of options have been considered in the development of metering language that applies to UPSs > 10 kW in this specification:

1) Require that all ENERGY STAR UPSs in this output category be sold with an internal or bundled external meter.

2) Require that an alternative model SKU incorporating a meter be made available for every ENERGY STAR qualified UPS model.

3) Provide an efficiency credit incentive to UPSs that are sold with a meter.

4) Require only informational reporting on PUE, data center efficiency, ENERGY STAR Buildings, and the role that metering can play in increasing data center efficiency.

EPA proposes to include an efficiency credit incentive. The decision to pursue an efficiency credit and sell a UPS with a meter is left up to the manufacturer, providing needed flexibility. The choice to measure PUE and overall energy efficiency will now be easier to make for data center operators purchasing new UPSs. Additionally, the ENERGY STAR program will be able to realize greater programmatic energy savings by encouraging greater energy efficiency monitoring at data centers. The reasonable level of the efficiency credit maintains ENERGY STAR label integrity.

3.7.1 Ac-output UPS products with output power greater than 10 kW may qualify for an additional 2% efficiency credit, as reflected in the requirements in Section 3.3.1, if sold with an energy meter possessing the following characteristics:

i. The meter is either installed internally or shipped as an independent, external component bundled with the UPS system at the point of sale.

ii. The meter must at a minimum measure kWh.

Note: EPA welcomes stakeholder comments on additional requirements to ensure reasonably accurate metering output and useful capabilities for end-users.

4 TESTING

4.1 Test Methods

4.1.1 When testing UPSs, the test methods identified in Table 6 shall be used to determine ENERGY STAR qualification.

Table 6: Test Methods for ENERGY STAR Qualification

Product Type	Test Method
All UPSs	ENERGY STAR Test Method for Uninterruptible Power Supplies, Rev. Oct-2011

4.2 Number of Units Required for Testing

4.2.1 Representative Models shall be selected for testing per the following requirements:

i. For qualification of an individual product model, a product configuration equivalent to that which is intended to be marketed and labeled as ENERGY STAR is considered the Representative Model;

ii. For qualification of a Modular UPS Product Family, the maximum and minimum configurations are both considered Representative Models—i.e., a modular system shall meet the eligibility criteria in both its maximum and minimum non-redundant configurations. If the maximum and minimum configuration Representative Models meet the ENERGY STAR qualification criteria at their respective output power levels, all intermediate configuration models within a Modular UPS Product Family may be qualified for ENERGY STAR.

iii. For qualification of a UPS Product Family where the models are related by a characteristic other than the number of installed modules, the highest energy using configuration within the family shall be considered the Representative Model. When submitting product families, manufacturers continue to be held accountable for any efficiency claims made about their imaging products, including those not tested or for which data was not reported.

4.2.2 A single unit of each Representative Model shall be selected for testing.

4.2.3 All tested units shall meet ENERGY STAR qualification criteria.

5 EFFECTIVE DATE

5.1.1 Effective Date: The Version 1.0 ENERGY STAR UPS specification shall take effect on the date specified in Table 7. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on its date of manufacture. The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.

5.1.2 Future Specification Revisions: EPA reserves the right to change this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through stakeholder discussions. In the event of a specification revision, please note that the ENERGY STAR qualification is not automatically granted for the life of a product model.

Table 7: Specification Effective Date

Effective Date
April 1, 2012

Note: EPA expects the UPS v1.0 specification to be final on or around January 1, 2012. Due to the complexity, cost, and possibility of training involved in qualifying products to this particular specification, EPA is allowing up to three extra months for CBs and labs to be recognized and prepared. Stakeholders that are prepared to qualify products after the final specification is published (January 1, 2012) but before the effective date listed above may do so—the date is not intended to hold anyone back. EPA welcomes stakeholder comments on this proposal, including comments to move the date closer to the final specification date if stakeholders will be ready to qualify products on or very near to January 1, 2012.