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# ENERGY STAR® Program Requirements for Imaging Equipment

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# ENERGY STAR® Program Requirements for Imaging Equipment

## Partner Commitments Version 1.1 – DRAFT 2

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### Commitment

17 The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the  
18 manufacturing of ENERGY STAR qualified imaging equipment. The ENERGY STAR Partner must adhere  
19 to the following program requirements:

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- Comply with current ENERGY STAR Eligibility Criteria defining the performance criteria that must be met for use of the ENERGY STAR certification mark on imaging equipment and specifying the testing criteria for imaging equipment. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request.
- Comply with current ENERGY STAR Identity Guidelines and Web-Based Tools for Partners document, describing how the ENERGY STAR name and mark may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance.
- Qualify at least one ENERGY STAR qualified imaging equipment model within six months of activating the imaging equipment portion of the agreement. When Partner qualifies the product, it must meet the specification in effect at that time.
- Provide clear and consistent labeling of ENERGY STAR qualified imaging equipment. The ENERGY STAR mark must be clearly displayed:
  1. Either on the top/front of product or through electronic messaging that is pre-approved by EPA. Labeling on the top/front of product may be permanent or temporary. All temporary labeling must be affixed to the top/front of product with an adhesive or cling-type application;
  2. On the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed. Specific guidance on using the ENERGY STAR mark on Internet sites is provided in the Web-Based Tools for Partners document;
  3. Either in product literature (e.g., user manuals, specification sheets, etc.) or in a separate box insert that provides educational language about the product's ENERGY STAR settings; and
  4. On product packaging/boxes for products sold at retail.
- Update the list of ENERGY STAR qualified imaging equipment models through the Online Product Submittal tool (OPS) on an annual basis at a minimum. Once the Partner submits its first list of ENERGY STAR qualified imaging equipment models, the Partner will be listed as an ENERGY STAR Partner on [www.energystar.gov](http://www.energystar.gov). Partner must provide annual updates in order to remain on the list of participating product manufacturers. If no new models are introduced during a particular year, Partner should notify EPA to ensure its partnership status is maintained.
- Provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified imaging equipment products shipped (in units) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is encouraged to provide unit shipment data segmented by meaningful product characteristics (e.g., product type, size, speed, marking technology, or other as relevant) for both the United States (US) and outside of the United States (non-US). Partner is also encouraged to provide total unit shipments for each model in its product line, and the percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third

65 party. The data will be used by EPA only for program evaluation purposes and will be closely  
66 controlled. Any information used will be masked by EPA so as to protect the confidentiality of the  
67 Partner.

- 68
- 69 • Notify EPA of a change in the designated responsible party or contacts for imaging equipment  
70 within 30 days.

71

## 72 **Performance for Special Distinction**

73 In order to receive additional recognition and/or support from EPA for its efforts within the  
74 Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep  
75 EPA informed on the progress of these efforts:

76

- 77 • Consider energy efficiency improvements in company facilities and pursue the ENERGY STAR  
78 label for buildings.
- 79
- 80 • Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement  
81 specifications to include ENERGY STAR. Provide procurement officials' contact information to  
82 EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product  
83 information to employees for use when purchasing products for their homes.
- 84
- 85 • Ensure the power management feature is enabled for all ENERGY STAR qualified monitors in use  
86 in company facilities, particularly upon installation and after service is performed.
- 87
- 88 • Provide general information about ENERGY STAR to employees whose jobs are relevant to the  
89 development, marketing, sales, and service of current ENERGY STAR qualified product models.
- 90
- 91 • Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the  
92 program requirements listed above. By doing so, EPA may be able to coordinate, communicate,  
93 and/or promote Partner's activities, provide an EPA representative, or include news about the  
94 event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may  
95 be as simple as providing a list of planned activities or milestones that Partner would like EPA to  
96 be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR  
97 qualified products by converting the entire product line within two years to meet ENERGY STAR  
98 guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through  
99 special in-store displays twice a year; (3) provide information to users (via the Web site and user's  
100 manual) about energy-saving features and operating characteristics of ENERGY STAR qualified  
101 products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by  
102 collaborating with EPA on one print advertorial and one live press event.
- 103
- 104 • Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase  
105 availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR  
106 and its message.



# ENERGY STAR® Program Requirements for Imaging Equipment

## Eligibility Criteria Version 1.1 – DRAFT 1

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Below is the DRAFT 1 Version 1.1 product specification for ENERGY STAR qualified Imaging Equipment. A product must meet all of the identified criteria if it is to be qualified as ENERGY STAR by its manufacturer.

1) **Definitions:** Below is a brief description of terms as relevant to ENERGY STAR.

### Products

- A. **Copier** – A commercially-available imaging product whose sole function is the production of hard copy duplicates from graphic hard copy originals. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as copiers or upgradeable digital copiers (UDCs).
- B. **Digital Duplicator** – A commercially-available imaging product that is sold in the market as a fully-automated duplicator system through the method of stencil duplicating with digital reproduction functionality. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as digital duplicators.
- C. **Facsimile Machine (Fax Machine)** – A commercially-available imaging product whose primary functions are scanning hard copy originals for electronic transmission to remote units and receiving similar electronic transmissions to produce hard copy output. Electronic transmission is primarily over a public telephone system, but also may be via computer network or the Internet. The product also may be capable of producing hard copy duplicates. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as fax machines.
- D. **Mailing Machine** – A commercially-available imaging product that serves to print postage onto mail pieces. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as mailing machines.
- E. **Multifunction Device (MFD)** – A commercially-available imaging product, which is a physically-integrated device or a combination of functionally-integrated components, that performs two or more of the core functions of copying, printing, scanning, or faxing. The copy functionality as addressed in this definition is considered to be distinct from single sheet convenience copying offered by fax machines. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as MFDs or multifunction products (MFPs).  
*Note: If the MFD is not a single integrated unit but a set of functionally integrated components, then the manufacturer must certify that when installed correctly in the field, the sum of all energy or power use for all MFD components comprising the base unit will achieve the energy or power levels provided in Section 3 to qualify as an ENERGY STAR MFD.*
- F. **Printer** – A commercially-available imaging product that serves as a hard copy output device, and is capable of receiving information from single-user or networked computers, or other input devices (e.g., digital cameras). The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as printers, including printers that can be upgraded into MFDs in the field.

164 G. Scanner – A commercially-available imaging product that functions as an electro-optical device  
165 for converting information into electronic images that can be stored, edited, converted, or  
166 transmitted, primarily in a personal computing environment. The unit must be capable of being  
167 powered from a wall outlet or from a data or network connection. This definition is intended to  
168 cover products that are marketed as scanners.

169  
170 **Marking Technologies**

171  
172 H. Direct Thermal (DT) – A marking technology that transfers an image by burning dots onto coated  
173 media as it passes over a heated print head. DT products do not use ribbons.

174  
175 I. Dye Sublimation (DS) – A marking technology where images are formed by depositing (subliming)  
176 dye onto the print media based upon the amount of energy delivered by the heating elements.

177  
178 J. Electrophotography (EP) – A marking technology characterized by illumination of a  
179 photoconductor in a pattern representing the desired hard copy image via a light source,  
180 development of the image with particles of toner using the latent image on the photoconductor to  
181 define the presence or absence of toner at a given location, transfer of the toner to the final hard  
182 copy medium, and fusing to cause the desired hard copy to become durable. Types of EP include  
183 Laser, LED, and LCD. Color EP is distinguished from monochrome EP in that toners of at least  
184 three different colors are available in a given product at one time. Two types of color EP  
185 technology are defined below:

186  
187 a. Parallel Color EP – A marking technology that uses multiple light sources and multiple  
188 photoconductors to increase the maximum color printing speed.

189  
190 b. Serial Color EP – A marking technology that uses a single photoconductor in a serial fashion  
191 and one or multiple light sources to achieve the multi-color hard copy output.

192  
193 K. High Performance Ink Jet: The use of thermal inkjet marking technology in high performance  
194 business applications usually occupied by electrophotographic marking technologies. This  
195 difference between the conventional Ink Jet product and the High Performance Ink Jet product is  
196 denoted by the presence of nozzle arrays that span the width of a page and/or the ability to dry  
197 the ink on the media through additional media heating mechanisms.

**Note:** Based on stakeholder comments on Draft 1 to define the High Performance Ink Jet marking technology, EPA is proposing the preceding definition for High Performance Ink Jet. This proposed definition is based on definitions received from stakeholders. Stakeholders are encouraged to comment on this definition or provide an alternative.

198  
199 L. Impact – A marking technology characterized by the formation of the desired hard copy image by  
200 transferring colorant from a “ribbon” to the media via an impact process. Two types of impact  
201 technology are Dot Formed Impact and Fully-formed Impact.

202  
203 M. Ink Jet (IJ) – A marking technology where images are formed by depositing colorant in small drops  
204 directly to the print media in a matrix manner. Color IJ is distinguished from monochrome IJ in  
205 that more than one colorant is available in a product at any one time. Typical types of IJ include  
206 Piezo-electric (PE) IJ, IJ Sublimation, and Thermal IJ.

207  
208 N. Solid Ink (SI) – A marking technology where the ink is solid at room temperature and liquid when  
209 heated to the jetting temperature. Transfer to the media can be direct, but is most often made to  
210 an intermediate drum or belt and then offset printed to the media.

211  
212 O. Stencil – A marking technology that transfers images onto the print media from a stencil that is  
213 fitted around an inked drum.

214  
215 P. Thermal Transfer (TT) – A marking technology where the desired hard copy image is formed by  
216 depositing small drops of solid colorant (usually colored waxes) in a melted/fluid state directly to

217 the print media in a matrix manner. TT is distinguished from IJ in that the ink is solid at room  
218 temperature and is made fluid by heat.

219  
220 **Operational Modes, Activities, and Power States**

- 221  
222 Q. Active – The power state in which the product is connected to a power source and is actively  
223 producing output, as well as performing any of its other primary functions.
- 224  
225 R. Automatic Duplexing – The capability of a copier, fax machine, MFD, or printer to automatically  
226 place images on both sides of an output sheet, without manual manipulation of output as an  
227 intermediate step. Examples of this are one-sided to two-sided copying and two-sided to two-  
228 sided copying. A product is considered to have automatic duplexing capability only if the model  
229 includes all accessories needed to satisfy the above conditions.
- 230  
231 S. Default Delay Time – The time set by the manufacturer prior to shipping that determines when the  
232 product will enter a lower-power mode (e.g., Sleep, Off) following completion of its primary  
233 function.
- 234  
235 T. Off – The power state that the product enters when it has been manually or automatically switched  
236 off but is still plugged in and connected to the mains. This mode is exited when stimulated by an  
237 input, such as a manual power switch or clock timer to bring the unit into Ready mode. When this  
238 state is resultant from a manual intervention by a user, it is often referred to as Manual Off, and  
239 when it is resultant from an automatic or predetermined stimuli (e.g., a delay time or clock), it is  
240 often referred to as Auto-off.
- 241  
242 U. Ready – The condition that exists when the product is not producing output, has reached  
243 operating conditions, has not yet entered into any lower-power modes, and can enter Active mode  
244 with minimal delay. All product features can be enabled in this mode, and the product must be  
245 able to return to Active mode by responding to any potential input options designed into the  
246 product. Potential inputs include external electrical stimulus (e.g., network stimulus, fax call, or  
247 remote control) and direct physical intervention (e.g., activating a physical switch or button).
- 248  
249 V. Sleep – The reduced power state that the product enters automatically after a period of inactivity.  
250 In addition to entering Sleep automatically, the product may also enter this mode 1) at a user set  
251 time-of-day, 2) immediately in response to user manual action, without actually turning off, or 3)  
252 through other, automatically-achieved ways that are related to user behavior. All product features  
253 can be enabled in this mode and the product must be able to enter Active mode by responding to  
254 any potential input options designed into the product; however, there may be a delay. Potential  
255 inputs include external electrical stimulus (e.g., network stimulus, fax call, remote control) and  
256 direct physical intervention (e.g., activating a physical switch or button). The product must  
257 maintain network connectivity while in Sleep, waking up only as necessary.
- 258  
259 **Note:** *When reporting data and qualifying products that can enter Sleep mode in multiple ways,*  
260 *partners should reference a Sleep level that can be reached automatically. If the product is*  
261 *capable of automatically entering multiple, successive Sleep levels, it is at the manufacturer's*  
262 *discretion which of these levels is used for qualification purposes; however, the default-delay time*  
263 *provided must correspond with whichever level is used.*
- 264  
265 W. Standby – The lowest power consumption mode which cannot be switched off (influenced) by the  
266 user and that may persist for an indefinite time when the product is connected to the main  
267 electricity supply and used in accordance with the manufacturer's instructions<sup>1</sup>.
- 268  
269 **Note:** *For Imaging Equipment products addressed by this specification, the Standby power level*  
270 *usually occurs in Off mode, but can occur in Ready or Sleep. A product cannot exit Standby and*  
271 *reach a lower power state unless it is physically disconnected from the main electricity supply as a*  
272 *result of manual manipulation.*
- 273

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1 IEC 62301 – Household electrical appliances – Measurement of standby power. 2005.

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## Product Size Formats

- X. Large Format – Products categorized as Large Format include those designed for A2 media and larger, including those designed to accommodate continuous-form media at a width of 406 millimeters (mm) or wider. Large-format products may also be capable of printing on standard-size or small-format media.
- Y. Small Format – Products categorized as Small Format include those designed for media sizes smaller than those defined as Standard (e.g., A6, 4" x 6", microfilm), including those designed to accommodate continuous-form media at widths smaller than 210 mm.
- Z. Standard – Products categorized as Standard include those designed for standard-sized media (e.g., Letter, Legal, Ledger, A3, A4, and B4), including those designed to accommodate continuous-form media at widths between 210 mm and 406 mm. Standard-size products may also be capable of printing on small-format media.

## Additional Terms

- AA. Accessory – An optional piece of peripheral equipment that is not necessary for the operation of the base unit, but that may be added before or after shipment in order to add functionality. An accessory may be sold separately under its own model number, or sold with a base unit as part of a package or configuration.
- BB. Base Product – A base product is the standard model shipped by the manufacturer. When product models are offered in different configurations, the base product is the most fundamental configuration of the model, which possesses the minimum number of functional adders available. Functional components or accessories offered as optional, rather than standard, are not considered part of the base product.
- CC. Continuous Form – Products categorized as Continuous Form include those which do not use a cut-sheet media size, and are designed for key industrial applications such as printing of bar codes, labels, receipts, waybills, invoices, airline tickets, or retail tags.
- DD. Digital Front-end (DFE) – A functionally-integrated, network-attached server or desktop-derived server that hosts other computers and applications and acts as an interface to imaging equipment. A DFE provides greater functionality to the imaging product. A DFE that draws its dc power from its own ac power supply is defined as an External DFE. A DFE that draws its dc power from the imaging equipment product with which it operates is defined as an Internal DFE. A DFE also offers **at least three** of the following advanced features:
  - a. Network connectivity in various environments;
  - b. Mailbox functionality;
  - c. Job queue management;
  - d. Machine management (e.g., waking the imaging equipment from a reduced power state);
  - e. Advanced graphic user-interface (UI);
  - f. Ability to initiate communication with other host servers and client computers (e.g., scanning to email, polling remote mailboxes for jobs); or
  - g. Ability to post-process pages (e.g., reformatting pages prior to printing).

**Note:** EPA has received comments from stakeholders that the definition of a DFE is not clear enough. The proposed definition of a DFE was the result of discussions between stakeholders and EPA. EPA welcomes comments on the proposed definition from all stakeholders.

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- EE. Functional Adder – A functional adder is a standard product feature that adds functionality to the base marking engine of an imaging equipment product. The Operational Mode portion of this

325 specification contains additional power allowances for certain functional adders. Examples of  
326 functional adders include wireless interfaces and scanning capability.

327  
328 FF. Operational Mode (OM) Approach – A method of testing and comparing the energy performance  
329 of imaging equipment products, which focuses on product energy consumption in various low-  
330 power modes. The key criteria used by the OM approach are values for low-power modes,  
331 measured in watts (W). Detailed information can be found in the “ENERGY STAR Qualified  
332 Imaging Equipment Operational Mode Test Procedure” available at [www.energystar.gov/products](http://www.energystar.gov/products).

333  
334 GG. Marking Engine – The very basic engine of an imaging product, which drives the image  
335 production of that product. Without additional functional components, a marking engine cannot  
336 acquire image data to process and is, therefore, non-functional. A marking engine is reliant on  
337 functional adders for communication ability and image processing.

338  
339 HH. Model – An imaging equipment product that is sold or marketed under a unique model number or  
340 marketing name. A model may be comprised of a base unit or a base unit and accessories.

341  
342 II. Product Speed – In general, for Standard-size products, a single A4 or 8.5” x 11” sheet  
343 printed/copied/scanned on one side in a minute is equal to one image-per-minute (ipm). If the  
344 maximum claimed speeds differ when producing images on A4 or 8.5” x 11” paper, the higher of  
345 the two shall be used.

- 346
- 347 ▪ For mailing machines, one piece of mail processed in a minute is equal to one mail-piece-  
348 per-minute (mppm).
  - 349 ▪ For Small-format products, a single A6 or 4” x 6” sheet printed/copied/scanned on one  
350 side in a minute is equal to 0.25 ipm.
  - 351 ▪ For Large-format products, a single A2 sheet is equivalent to 4 ipm and one A0 sheet is  
352 equivalent to 16 ipm.
  - 353 ▪ For continuous-form products categorized as Small-format, Large-format, or Standard-  
354 size, print speed in ipm should be obtained from the product’s maximum marketed  
355 imaging speed in meters per minute according to the conversion below:

356

$$357 \quad X \text{ ipm} = 16 \times [\text{Maximum media width (meters)} \times \text{Maximum imaging speed (length-} \\ 358 \text{ meters/minute)}]$$

359

360 In all cases, the converted speed in ipm should be rounded to the nearest integer (e.g., 14.4 ipm  
361 rounds to 14.0 ipm; 14.5 ipm rounds to 15 ipm).

362  
363 For qualification purposes, manufacturers should report the speed of the product according to the  
364 prioritization of functions outlined below:

- 365
- 366 ▪ **Print Speed**, unless the product cannot perform the print function, in which case,
  - 367 ▪ **Copy Speed**, unless the product cannot perform the print or copy functions, in which  
368 case,
  - 369 ▪ **Scan Speed**.

370 JJ. Typical Electricity Consumption (TEC) Approach – A method of testing and comparing the energy  
371 performance of imaging equipment products, which focuses on the typical electricity consumed by  
372 a product while in normal operation during a representative period of time. The key criteria of the  
373 TEC approach for imaging equipment is a value for typical weekly electricity consumption,  
374 measured in kilowatt-hours (kWh). Detailed information can be found in the “ENERGY STAR  
375 Qualified Imaging Equipment Typical Electricity Consumption Test Procedure” available at  
376 [www.energystar.gov/products](http://www.energystar.gov/products).

377  
378 2) **Qualifying Products**: This ENERGY STAR specification is intended to cover personal, business, and  
379 commercial imaging equipment products but not industrial products or products directly connected to  
380 three phase power. Units must be capable of being powered from a wall outlet or from a data or  
381 network connection and operate off of the international standard nominal voltage supplies listed in the  
382 document **Test Conditions and Equipment for ENERGY STAR Imaging Equipment Products**. In  
383 order to qualify as ENERGY STAR, an imaging equipment product must be defined in Section 1 and



meet one of the product descriptions in Table 1 or 2, below.

**Note:** EPA is proposing to add a clarification in Draft 2 in order to ensure only personal, business, and commercial imaging equipment are included based on manufacturer concerns. Stakeholders are encouraged to comment on this clarification.

**Qualifying Products: Table 1 - TEC Approach**

Product Area	Marking Technology	Size Format	Color Capability	TEC Table	Page
<b>Copiers</b>	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Color	TEC 2	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12
<b>Digital Duplicators</b>	Stencil	Standard	Color	TEC 2	12
	Stencil	Standard	Monochrome	TEC 1	12
<b>Fax Machines</b>	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12
<b>Multifunction Devices (MFDs)</b>	High Performance IJ	Standard	Monochrome	TEC 3	12
	High Performance IJ	Standard	Color	TEC 4	12
	Direct Thermal	Standard	Monochrome	TEC 3	13
	Dye Sublimation	Standard	Color	TEC 4	13
	Dye Sublimation	Standard	Monochrome	TEC 3	13
	EP	Standard	Monochrome	TEC 3	13
	EP	Standard	Color	TEC 4	13
	Solid Ink	Standard	Color	TEC 4	13
	Thermal Transfer	Standard	Color	TEC 4	13
	Thermal Transfer	Standard	Monochrome	TEC 3	13
<b>Printers</b>	High Performance IJ	Standard	Monochrome	TEC 1	12
	High Performance IJ	Standard	Color	TEC 2	12
	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Color	TEC 2	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12

**Note:** EPA included High Performance IJ marking technology under the TEC approach in this TEC table based on stakeholder feedback. The high performance inkjet marking technology was previously allowed to qualify under the TEC approach, though not explicit throughout the specification. EPA has made clear in the above Table 1 the inclusion of this marking technology for Tier 2. Stakeholders are encouraged to comment on this inclusion.

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**Qualifying Products: Table 2 – Operational Mode Approach**

<b>Product Area</b>	<b>Marking Technology</b>	<b>Size Format</b>	<b>Color Capability</b>	<b>OM Table</b>	<b>Page</b>
<b>Copiers</b>	Direct Thermal	Large	Monochrome	OM 1	17
	Dye Sublimation	Large	Color & Monochrome	OM 1	17
	EP	Large	Color & Monochrome	OM 1	17
	Solid Ink	Large	Color	OM 1	17
	Thermal Transfer	Large	Color & Monochrome	OM 1	17
<b>Fax Machines</b>	Ink Jet	Standard	Color & Monochrome	OM 2	17
<b>Mailing Machines</b>	Direct Thermal	N/A	Monochrome	OM 4	17
	EP	N/A	Monochrome	OM 4	17
	Ink Jet	N/A	Monochrome	OM 4	17
	Thermal Transfer	N/A	Monochrome	OM 4	17
<b>Multifunction Devices (MFDs)</b>	Direct Thermal	Large	Monochrome	OM 1	17
	Dye Sublimation	Large	Color & Monochrome	OM 1	17
	EP	Large	Color & Monochrome	OM 1	17
	Ink Jet	Standard	Color & Monochrome	OM 2	17
	Ink Jet	Large	Color & Monochrome	OM 3	17
	Solid Ink	Large	Color	OM 1	17
	Thermal Transfer	Large	Color & Monochrome	OM 1	17
<b>Printers</b>	Direct Thermal	Large	Monochrome	OM 8	18
	Direct Thermal	Small	Monochrome	OM 5	18
	Dye Sublimation	Large	Color & Monochrome	OM 8	18
	Dye Sublimation	Small	Color & Monochrome	OM 5	18
	EP	Large	Color & Monochrome	OM 8	18
	EP	Small	Color	OM 5	18
	Impact	Large	Color & Monochrome	OM 8	18
	Impact	Small	Color & Monochrome	OM 5	18
	Impact	Standard	Color & Monochrome	OM 6	18
	Ink Jet	Large	Color & Monochrome	OM 3	17
	Ink Jet	Small	Color & Monochrome	OM 5	18
	Ink Jet	Standard	Color & Monochrome	OM 2	17
	Solid Ink	Large	Color	OM 8	18
	Solid Ink	Small	Color	OM 5	18
	Thermal Transfer	Large	Color & Monochrome	OM 8	18
Thermal Transfer	Small	Color & Monochrome	OM 5	18	
<b>Scanners</b>	N/A	Large, Small & Standard	N/A	OM 7	18

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- 3) **Energy-Efficiency Specifications for Qualifying Products:** Only those products listed in Section 2 above that meet the following criteria may qualify as ENERGY STAR. Effective dates are provided in Section 6 of this specification.

Products Sold with an External Power Adapter: To qualify as ENERGY STAR under the Imaging Equipment Version 1.1 Tier 2 requirements, imaging equipment products manufactured on or after April 1, 2009 using a single-voltage external ac-dc or ac-ac power adapter must use an ENERGY STAR qualified adapter, or one that meets the ENERGY STAR External Power Supply (EPS) Version 2.0 requirements when tested to the ENERGY STAR test method. The ENERGY STAR specification and test method for single voltage external ac-dc and ac-ac power supplies may be found at [www.energystar.gov/products](http://www.energystar.gov/products).

Products Designed to Operate with an External DFE: To qualify as ENERGY STAR under Imaging Equipment Version 1.1 specifications, an imaging equipment product manufactured after July 1, 2009 that is sold with an External DFE must use a DFE that meets the ENERGY STAR Imaging Equipment

410 Digital Front End Power Supply Efficiency Requirements.

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412 Products Designed to Operate with an Internal DFE: To qualify as ENERGY STAR under Imaging  
413 Equipment Version 1.1 specifications, an imaging equipment product manufactured after July 1, 2009  
414 which is sold with an Internal DFE, the internal DFE's energy consumption in Ready mode should be  
415 subtracted for TEC products or be excluded when measuring Sleep for OM products. Section 3A  
416 provides further detail on adjusting TEC values for internal DFEs for TEC products and Section 3B  
417 provides further detail for on excluding internal DFEs from OM sleep levels.

**Note:** Based on feedback, the proposed DFE requirements no longer refer to an existing ENERGY STAR specification (i.e., ENERGY STAR Version 4.0 Computer specification). EPA worked with stakeholders to come up with the proposed DFE requirements and definitions. Stakeholders are encouraged to comments on these clarifications or provide on alternatives.

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420 Products Sold with an Additional Cordless Handset: To qualify, fax machines or MFDs with fax  
421 capability that are sold with additional cordless handsets must use an ENERGY STAR qualified  
422 handset, or one that meets the ENERGY STAR Telephony specification when tested to the ENERGY  
423 STAR test method on the date the imaging product is qualified as ENERGY STAR. The ENERGY  
424 STAR specification and test method for telephony products may be found at  
425 [www.energystar.gov/products](http://www.energystar.gov/products).

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427 Duplexing: Standard-size copiers, MFDs, and printers that use EP, SI, and high performance IJ  
428 marking technologies addressed by the TEC approach in Section 3.A. must meet the following  
429 duplexing requirements, based on product speed:

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Color Copiers, MFDs, and Printers

Product Speed	Duplexing Requirement
≤ 19 ipm	N/A
20 – 39 ipm	Automatic duplexing must be offered as a <b>standard feature</b> or <b>optional accessory</b> at the time of purchase.
≥ 40 ipm	Automatic duplexing is required as a <b>standard feature</b> at the time of purchase.

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Monochrome Copiers, MFDs, and Printers

Product Speed	Duplexing Requirement
≤ 24 ipm	N/A
25 – 44 ipm	Automatic duplexing must be offered as a <b>standard feature</b> or <b>optional accessory</b> at the time of purchase.
≥ 45 ipm	Automatic duplexing is required as a <b>standard feature</b> at the time of purchase.

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- A. **ENERGY STAR Eligibility Criteria – TEC.** To qualify as ENERGY STAR, the TEC value obtained for imaging equipment outlined in Section 2, Table 1 above must not exceed the corresponding criteria below.

For imaging products with a functionally-integrated DFE that relies on the imaging product for its power, manufacturers should subtract the DFE's energy consumption in Ready mode from the product's total TEC result before comparing the product's TEC to the criteria limits below. In order to take advantage of this allowance, the DFE must meet the definition in Section 1.CC. and be a separate processing unit that is capable of initiating activity over the network.

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Example: A printer's total TEC result is 24.5 kWh/week and its internal DFE consumes 50W in Ready mode. 50W x 168 hours/week = 8.4 kWh/week, which is then subtracted from the tested TEC value: 24.5 kWh/week – 8.4 kWh/week = 16.1 kWh/week. 16.1 kWh/week is then compared to the following criteria.

**Note: In all of the following equations, x = Product speed (ipm).**

**TEC Table 1**

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono Stencil, Mono TT, Mono High Performance IJ	
<u>Tier II</u>	
Product Speed (ipm)	Maximum TEC (kWh/week)
$\leq 15$	<b>1.0 kWh</b>
$15 < ipm \leq 40$	<b><math>(0.10 \text{ kWh/ipm})x - 0.5 \text{ kWh}</math></b>
$40 < ipm \leq 81$	<b><math>(0.35 \text{ kWh/ipm})x - 10.5 \text{ kWh}</math></b>
$> 81$	<b><math>(0.70 \text{ kWh/ipm})x - 39.0 \text{ kWh}</math></b>

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**TEC Table 2**

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color Stencil, Color TT, Color EP, SI, Color High Performance IJ	
<u>Tier II</u>	
Product Speed (ipm)	Maximum TEC (kWh/week)
$\leq 32$	<b><math>(0.10 \text{ kWh/ipm})x + 2.8 \text{ kWh}</math></b>
$32 < ipm \leq 58$	<b><math>(0.35 \text{ kWh/ipm})x - 5.2 \text{ kWh}</math></b>
$> 58$	<b><math>(0.70 \text{ kWh/ipm})x - 26.0 \text{ kWh}</math></b>

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**TEC Table 3**

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono TT, Mono High Performance IJ	
<u>Tier II</u>	
Product Speed (ipm)	Maximum TEC (kWh/week)
$\leq 10$	<b>1.5 kWh</b>
$10 < ipm \leq 26$	<b><math>(0.10 \text{ kWh/ipm})x + 0.5 \text{ kWh}</math></b>
$26 < ipm \leq 68$	<b><math>(0.35 \text{ kWh/ipm})x - 6.0 \text{ kWh}</math></b>
$> 68$	<b><math>(0.70 \text{ kWh/ipm})x - 30.0 \text{ kWh}</math></b>

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**TEC Table 4**

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color TT, Color EP, SI, Color High Performance IJ	
<u>Tier II</u>	
Product Speed (ipm)	Maximum TEC (kWh/week)
$\leq 26$	<b><math>(0.10 \text{ kWh/ipm})x + 3.5 \text{ kWh}</math></b>
$26 < ipm \leq 62$	<b><math>(0.35 \text{ kWh/ipm})x - 3.0 \text{ kWh}</math></b>
$> 62$	<b><math>(0.70 \text{ kWh/ipm})x - 25.0 \text{ kWh}</math></b>

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**Note:** The primary objective of ENERGY STAR is to recognize the most energy efficient products in the marketplace. In developing this specification, EPA considers the following criteria:

- Significant energy savings can be realized on a national basis
- Product performance is maintained or enhanced with increased efficiency
- Purchase of high efficiency product will be cost effective
- Energy efficiency can be achieved through several technology options
- Energy consumption and performance can be measured and verified with testing
- Labeling would effectively differentiate products and be visible for purchasers.

It is not EPA's intention to design a specification that will allow every model to qualify. When revising a specification, EPA takes into account cost effectiveness to the consumer and product performance when recognizing the top percentile of products in the marketplace. The TEC levels proposed in these tables represent approximately 25% of models currently available on the market in the U.S. As in Tier 1, digital duplicators were not included in establishing the qualification rate. Further details on the TEC data analysis can be found in the data summary document distributed with this specification.

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**B. ENERGY STAR Eligibility Criteria – OM.** To qualify as ENERGY STAR, the power consumption values for imaging equipment outlined in Section 2, Table 2 above must not exceed the corresponding criteria below. For products that meet the Sleep-mode power requirement in Ready mode, no further automatic power reductions are required to meet the Sleep criterion. Additionally, for products that meet the Standby-power requirements in Ready or Sleep mode, no further power reductions are required to earn the ENERGY STAR.

For imaging products with a functionally-integrated DFE that relies on the imaging product for its power, the power consumption of the DFE should be excluded when comparing the product's measured Sleep to the combined marking-engine and functional-adder criteria limits below. The DFE must not interfere with the ability of the imaging product to enter or exit its lower-power modes. In order to take advantage of this exclusion, the DFE must meet the definition in Section 1.CC. and be a separate processing unit that is capable of initiating activity over the network.

Default Delay Time Requirements: To qualify for ENERGY STAR, OM products must meet the default-delay time settings provided in Tables A through C below for each product type, enabled upon product shipment. In addition, all OM products must be shipped with a maximum **machine** delay time not in excess of four hours, which is only adjustable by the manufacturer. This maximum machine delay time cannot be influenced by the user and typically cannot be modified without internal, invasive product manipulation. The default-delay-time settings provided in Tables A through C may be user adjustable.

**Table A: Maximum Default Delay Times to Sleep for Small-format and Standard-size OM Products, Excluding Mailing Machines, in Minutes**

Product Speed (ipm)	Fax Machines	MFDs	Printers	Scanners
0 - 10	5	15	5	15
11 - 20	5	30	15	15
21 - 30	5	60	30	15
31 - 50	5	60	60	15
51 +	5	60	60	15

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**Table B: Maximum Default Delay Times to Sleep for Large-format OM Products, Excluding Mailing Machines, in Minutes**

Product Speed (ipm)	Copiers	MFDs	Printers	Scanners
0 - 10	30	30	30	15
11 - 20	30	30	30	15
21 - 30	30	30	30	15
31 - 50	60	60	60	15
51 +	60	60	60	15

**Note:** Based on stakeholder comment, EPA is proposing a 60 minute maximum default delay time to sleep for Copiers with speed ranges of 31-50 ipm to be consistent with the requirement for this speed category of MFDs. Stakeholders are encouraged to provide feedback on this proposal.

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**Table C: Maximum Default Delay Times to Sleep for Mailing Machines in Minutes**

Product Speed (mppm)	Mailing Machines
0 – 50	20
51 – 100	30
101 – 150	40
151 +	60

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Standby Requirements: To qualify for ENERGY STAR, OM products must meet the Standby power criteria provided in Table D below for each product type.

**Table D: Maximum Standby Power Levels for OM Products in Watts**

Product Type & Size Format	Standby (W) – Tier 2
All Small Format and Standard-size OM Products <b>without</b> Fax Capability	<b>1</b>
All Small Format and Standard-size OM Products <b>with</b> Fax Capability	<b>1</b>
All Large Format OM Products and Mailing Machines	<b>1</b>

**Note:** EPA is proposing a 1.0W Standby criterion for all OM products, regardless of fax capability. The previous Standby level for small and standard-size format OM products with fax capability was 2.0W in Draft 1. This 1.0W Standby requirement is consistent with international criteria. Stakeholders are encouraged to provide feedback on this proposal.

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The eligibility criteria in OM Tables 1 through 8 below address the marking engine of the product. Since products are expected to be shipped with one or more functions beyond a basic marking engine, the corresponding allowances below should be added to the marking engine criteria for Sleep. The total value for the base product with applicable “functional adders” should be used to determine eligibility. Manufacturers may apply no more than **three** Primary functional adders to each product model, but may apply as many Secondary adders as present (with Primary adders in excess of three included as Secondary adders). An example of this approach is provided below:

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Example: Consider a Standard-size IJ printer with a USB 2.0 connection and a memory card connection. Assuming the USB connection is the Primary interface used during the test, the printer model would receive a functional-adder allowance of 0.5 W for USB and 0.1 for the memory card reader, for a total of 0.6 W of total functional-adder allowances. Since OM Table 2 provides a Sleep mode marking-engine criterion of 3 W, to determine qualification under ENERGY STAR, the manufacturer would sum the Sleep mode marking-engine criterion with the applicable functional-adder allowances to determine the maximum power consumption permitted for qualification of the base product: 3 W + 0.6 W. If the power consumption of the printer in Sleep mode measures at or below 3.6 W, then the printer would meet the ENERGY STAR Sleep criterion.

**Qualifying Products: Table 3 – OM Functional Adders**

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
<b>Interfaces</b>	A. Wired < 20 MHz	0.3	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate < 20 MHz. Includes USB 1.x, IEEE488, IEEE 1284/Parallel/Centronics, RS232, and/or fax modem.		
	B. Wired ≥ 20 MHz and < 500 MHz	0.5	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 20 MHz and < 500 MHz. Includes USB 2.x, IEEE 1394/FireWire/i.LINK, and 100Mb Ethernet.		
	C. Wired ≥ 500 MHz	1.5	0.5
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 500 MHz. Includes 1G Ethernet.		
	D. Wireless	3.0	0.7
	A data- or network-connection interface present on the imaging product that is designed to transfer data via radio-frequency wireless means. Includes Bluetooth and 802.11.		
	E. Wired card/camera/storage	0.5	0.1
	A physical data- or network-connection port present on the imaging product that is designed to allow the connection of an external device, such as flash memory-card/smart-card readers and camera interfaces (including PictBridge).		
	G. Infrared	0.2	0.2
A data- or network-connection interface present on the imaging product that is designed to transfer data via infrared technology. Includes IrDA.			
<b>Other</b>	Storage	-	0.2
	Internal storage drives present on the imaging product. Includes internal drives only (e.g., disk drives, DVD drives, Zip drives), and applies to each separate drive. This adder does not cover interfaces to external drives (e.g., SCSI) or internal memory.		
	Scanners with CCFL lamps or non-CCFL lamps	-	0.5
	The presence of a scanner that uses Cold Cathode Fluorescent Lamp (CCFL) technology or a technology other than CCFL, such as Light-Emitting Diode (LED), Halogen, Hot-Cathode Fluorescent Tube (HCFT), Xenon, or Tubular Fluorescent (TL) technologies. This adder is applied only once, regardless of the lamp size or the number of lamps/bulbs employed.		
	PC-based system (cannot print/copy/scan without use of significant PC resources)	-	-0.5

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
	This adder applies to imaging products that rely on an external computer for <b>significant</b> resources, such as memory and data processing, to perform basic functions commonly performed by imaging products independently, such as page rendering. This adder does not apply to products that simply use a computer as a source or destination for image data.		
	Cordless handset	-	0.8
	The capability of the imaging product to communicate with a cordless handset. This adder is applied only once, regardless of the number of cordless handsets the product is designed to handle. This adder does not address the power requirements of the cordless handset itself.		
	Memory	-	1.0 W per 1 GB
	The internal capacity available in the imaging product for storing data. This adder applies to all volumes of internal memory and should be scaled accordingly. <u>For example</u> , a unit with 2.5 GB of memory would receive an allowance of 2.5 W while a unit with 0.5 GB would receive an allowance of 0.5 W.		
	Power-supply (PS) size, based on PS output rating (OR) <b>[Note: this adder ONLY applies to products which fall under OM Tables 2 and 6]</b>	-	For PSOR > 10 W, 0.02 x (PSOR – 10 W)
	This adder applies to only those imaging products which fall under OM Tables 2 and 6. The allowance is calculated from the internal or external power supply's <b>rated DC output</b> as specified by the power supply manufacturer. (It is <b>not</b> a measured quantity). <u>For example</u> , a unit that is rated to provide up to 3 A at 12 V has a PSOR of 36 W and would receive an allowance of $0.02 \times (36-10) = 0.02 \times 26 = 0.52$ W of power supply allowance. For supplies that provide more than one voltage, the sum of power from all voltages is used unless the specifications note that there is a rated limit lower than this. <u>For example</u> , a supply which can supply 3A of 24 V and 1.5 A of 5 V output has a total PSOR of $(3 \times 24) + (1.5 \times 5) = 79.5$ W, and an allowance of 1.39 W.		

**Note:** Based on stakeholder feedback, EPA is proposing to add fax modem as a functional adder under the “Wired < 20 MHz” interface (primary = 0.3W, secondary = 0.2W). In addition, EPA is proposing that scanners with CCFL lamps and non-CCFL lamps have a similar secondary adder allowance. EPA proposes this value be 0.5W, the current allowance for non-CCFLs.

In addition, based on stakeholder feedback and the data analysis, EPA is proposing to include the Power-supply (PS) size as a secondary functional adder for imaging equipment products in the OM2 and OM6 categories. Please note that the calculation for this adder based on the PS is slightly different than the calculation in the Version 1.0 specification.

Stakeholders are encouraged to provide comments on these proposals.

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533 For the adder allowances shown in Qualifying Products Table 3 above, distinctions are made for  
534 “Primary” and “Secondary” types of adders. These designations refer to the state in which the  
535 interface is required to remain while the imaging product is in Sleep. Connections that remain  
536 active during the OM test procedure while the imaging product is in Sleep are defined as Primary,  
537 while connections that can be inactive while the imaging product is in Sleep are defined as  
538 Secondary. Most functional adders typically are Secondary types.

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540 Manufacturers should consider only the adder types that are available on a product in its as-  
541 shipped configuration. Options available to the consumer after the product is shipped or  
542 interfaces that are present on the product’s externally-powered digital front-end (DFE) should not  
543 be considered when applying allowances to the imaging product.

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545 For products with multiple interfaces, these interfaces should be considered as unique and  
546 separate. However, interfaces that perform multiple functions should only be considered once.



547 For example, a USB connection that operates as both 1.x and 2.x may be counted only once and  
 548 given a single allowance. When a particular interface may fall under more than one interface  
 549 Type according to the table, the manufacturer should choose the function that the interface is  
 550 primarily designed to perform when determining the appropriate adder allowance. For example, a  
 551 USB connection on the front of the imaging product that is marketed as a PictBridge or “camera  
 552 interface” in product literature should be considered a Type E interface rather than a Type B  
 553 interface. Similarly, a memory-card-reader slot that supports multiple formats may only be  
 554 counted once. Further, a system that supports more than one type of 802.11 may count as only  
 555 one wireless interface.  
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558 **OM Table 1**

Product(s): Copiers, MFDs	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	<b>14</b>

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**OM Table 2**

Product(s): Fax Machines, MFDs, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	<b>1.4</b>

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**OM Table 3**

Product(s): MFDs, Printers	
Size Format(s): Large Format	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	<b>15</b>

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**OM Table 4**

Product(s): Mailing Machines	
Size Format(s): N/A	
Marking Technologies: DT, Mono EP, Mono IJ, Mono TT	
	Sleep (W)
Marking Engine	<b>7</b>

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**OM Table 5**

Product(s): Printers	
Size Format(s): Small Format	
Marking Technologies: Color DS, DT, Color IJ, Color Impact, Color TT, Mono DS, Mono EP, Mono IJ, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	<b>9</b>

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**OM Table 6**

Product(s): Printers	
Size Format(s): Standard-size	
Marking Technologies: Color Impact, Mono Impact	
	Sleep (W)
Marking Engine	4.6

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**OM Table 7**

Product(s): Scanners	
Size Format(s): Large Format, Small Format, Standard-size	
Marking Technologies: N/A	
	Sleep (W)
Scanning Engine	3.5

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**OM Table 8**

Product(s): Printers	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color Impact, Color TT, DT, Mono DS, Mono EP, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	14

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**Note:** When possible, the OM levels proposed in these tables represented approximately 25% of models currently available on the market in the U.S. In some cases, due to more limited qualified product availability under Tier 1, the Sleep allowances for some OM tables (OM3, OM4, and OM5) have effectively remained the same in Tier 2 to ensure consumers have access to variety of qualified models.

In addition the current Tier 2 Sleep mode allowance for OM1 was set to similar level as OM8 due to the fact that products in OM1 are basically built from a print-engine (including an optional DFE) plus a scanner. EPA intends to increase the OM1 Sleep allowance by some amount over the OM8 allowance of 14 W. EPA asks stakeholder for input on an appropriate adder for the additional scanning function of OM1 products as compared to OM8.

Further details on the OM data analysis can be found in the data summary document distributed with this specification. Stakeholders are encouraged to provide comments on these requirements.

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C. **DFE Efficiency Requirements.** The following efficiency requirements are for Digital Front End equipment that is defined in Section 1.DD. of this specification.

i. **Power Supply Efficiency Requirements**

**DFEs Using an Internal Ac-Dc Power Supply:** A DFE that gets its power from an internal Ac-Dc power source must meet the power supply efficiency established under the Computer 4.0 specification development process 80% minimum efficiency at 20%, 50%, and 100% of rated output and Power Factor > 0.9 at 100% of rated output.

**DFEs Using an External Power Supply:** A DFE that draws its Dc power from its own Ac power supply must be ENERGY STAR qualified or meet the no-load and active mode efficiency levels provided in the ENERGY STAR V2.0 Program Requirements for Single

604 Voltage Ac-Ac and Ac-Dc External Power Supplies. The ENERGY STAR specification  
 605 can be found at  
 606 [http://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/eps\\_spec\\_v2.pdf](http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/eps_spec_v2.pdf).  
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609 ii. Test Procedures

610 Manufacturers are required to perform tests and self-certify those models that meet the  
 611 ENERGY STAR guidelines.

- 613 • In performing these tests, the partner agrees to use the applicable test procedures  
 614 provided in Table 4, below.
- 615 • The test results for qualifying products must be reported to EPA or the European  
 616 Commission, as appropriate.

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 618 Additional testing and reporting requirements are provided below.

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 620 Models Capable of Operating at Multiple Voltage/Frequency Combinations: Manufacturers shall  
 621 test their products based on the market(s) in which the models will be sold and promoted as  
 622 ENERGY STAR qualified. EPA and its ENERGY STAR Country Partners have agreed upon a  
 623 table with three voltage/frequency combinations for testing purposes. Please refer to the TEST  
 624 CONDITIONS AND EQUIPMENT FOR ENERGY STAR IMAGING EQUIPMENT PRODUCTS for  
 625 details regarding international voltage/frequency combinations for each market.

626  
 627 For products that are sold as ENERGY STAR in multiple international markets and, therefore,  
 628 rated at multiple input voltages, the manufacturer must test at and report the required power  
 629 consumption or efficiency values at all relevant voltage/frequency combinations. For example, a  
 630 manufacturer that is shipping the same model to the United States and Europe must measure,  
 631 meet the specification, and report test values at both 115 Volts/60 Hz and 230 Volts/50 Hz in order  
 632 to qualify the model as ENERGY STAR in both markets. If a model qualifies as ENERGY STAR at  
 633 only one voltage/frequency combination (e.g., 115 Volts/60 Hz), then it may only be qualified and  
 634 promoted as ENERGY STAR in those regions that support the tested voltage/frequency  
 635 combination (e.g., North America and Taiwan).  
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638 **Table 4: Test Procedures for Measuring Operational Modes**

Specification Requirement	Test Protocol	Source
Power Supply Efficiency	Internal Power Supply (IPS)	IPS: <a href="http://www.efficientpowersupplies.org">www.efficientpowersupplies.org</a>
	External Power Supply (EPS): ENERGY STAR Test	EPS: <a href="http://www.energystar.gov/powersupplies">www.energystar.gov/powersupplies</a>

639 **Note:** EPA worked with stakeholders to determine these proposed DFE efficiency requirements. As previously stated, based on feedback from stakeholders, DFE requirements no longer refer to another existing ENERGY STAR specification due to the fact that DFEs are a unique category of products not covered under existing specifications. DFE requirements are now contained within this specification. The proposed requirements listed in this section are the result of discussions between EPA and stakeholders. Stakeholders are encouraged to comment on these requirements.

This performance requirement also applies to multiple voltage output external power supplies as tested in accordance to the Internal Power Supply test method referenced. Stakeholders are encouraged to provide feedback on if there are any of these on the market or anticipated to be introduced and whether these requirements should apply for multiple voltage EPS.

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#### 4) Test Procedures

Product Testing Set-up, Procedures, and Documentation: The specific instructions for testing the energy efficiency of imaging equipment products are outlined in three separate documents entitled:

- “ENERGY STAR Qualified Imaging Equipment Typical Electricity Consumption Test Procedure;”
- “ENERGY STAR Qualified Imaging Equipment Operational Mode Test Procedure;” and
- “Test Conditions and Equipment for ENERGY STAR Imaging Equipment Products.”

The test results produced by these procedures shall be used as the primary basis for determining ENERGY STAR qualification.

Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. Families of imaging equipment models that are built on the same chassis and are identical in every respect except for housing and color may be qualified through submission of test data for a single, representative model. Likewise, models that are unchanged or that differ only in finish from those sold in a previous year may remain qualified without the submission of new test data, assuming the specification remains unchanged.

If a product model is offered in the market in multiple configurations as a product “family” or series, the partner may test and report the highest configuration available in the family, rather than each and every individual model. When submitting model 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.

Example: Models A and B are identical, with the exception that model A is shipped with a wired interface > 500 MHz, and model B is shipped with a wired interface < 500 MHz. If model A is tested and meets the ENERGY STAR specification, then the partner may report the test data solely for model A, to represent both models A and B.

If a product’s electrical power comes from Mains, USB, IEEE1394, Power-over-Ethernet, telephone system, or any other means or combinations of means, the net AC electrical power consumed by the product (taking into account ac-to-dc conversion losses, as specified in the OM test procedure) must be used for qualification.

Additional testing and reporting requirements are provided below.

- A. Number of Units Required for Test: Testing shall be conducted by the manufacturer or its authorized representative on a single unit of a model.
  - a. For products outlined in Section 2, Table 1 of this specification, if the initial unit tested has TEC test results that meet the eligibility criteria but fall within 10% of the criteria level, one additional unit of the same model must also be tested. Manufacturers shall report values for both units. To qualify as ENERGY STAR, both units must meet the ENERGY STAR specification.
  - b. For products outlined in Section 2, Table 2 of this specification, if the initial unit tested has OM test results that meet the eligibility criteria but fall within 15% of the criteria level in any of the specified operating modes for that product type, then two more units shall be tested. To qualify as ENERGY STAR, all three units must meet the ENERGY STAR specification.
- B. Submission of Qualified Product Data to EPA: Partners are required to self-certify those product models that meet the ENERGY STAR guidelines and report information to EPA. The information to be reported for products shall be outlined shortly following publication of the final specification.

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In addition, partners must submit to EPA excerpts from product literature that explain to consumers the recommended default delay-times for power management settings. The intent of this requirement is to support that products are being tested as shipped and recommended for use.

- C. Models Capable of Operating at Multiple Voltage/Frequency Combinations: Manufacturers shall test their products based on the market(s) in which the models will be sold and promoted as ENERGY STAR qualified. EPA and its ENERGY STAR Country Partners have agreed upon a table with three voltage/frequency combinations for testing purposes. Please refer to the Imaging Equipment **Test Conditions** for details regarding international voltage/frequency and paper sizes for each market. Products tested must operate off of the international standard nominal voltage supplies listed in the **Test Conditions**.

For products that are sold as ENERGY STAR in multiple international markets and therefore rated at multiple input voltages, the manufacturer must test at and report the required power consumption or efficiency values at all relevant voltage/frequency combinations. For example, a manufacturer that is shipping the same model to the United States and Europe must measure, meet the specification, and report test values at both 115 Volts/60 Hz and 230 Volts/50 Hz in order to qualify the model as ENERGY STAR in both markets. If a model qualifies as ENERGY STAR at only one voltage/frequency combination (e.g., 115 Volts/60 Hz), then it may only be qualified and promoted as ENERGY STAR in those regions that support the tested voltage/frequency combination (e.g., North America and Taiwan).

- 5) **User Interface**: Manufacturers are strongly recommended to design products in accordance with IEEE 1621: Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments. This standard was developed to make power controls more consistent and intuitive across all electronic devices. For details on the development of this standard, see <http://eetd.lbl.gov/controls>.
- 6) **Effective Date**: The date that manufacturers may begin to qualify products as ENERGY STAR under the Version 1.1 specification, will be defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified imaging equipment shall be terminated effective June 30, 2009.
- A. Qualifying and Labeling Products under Version 1.1: The Version 1.1 specification shall commence on July 1, 2009. All products, including models originally qualified under previous imaging equipment specifications, with a **date of manufacture** on or after the effective date, must meet the new Version 1.1 requirements in order to qualify for ENERGY STAR (including additional manufacturing runs of models originally qualified under previous specifications). 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.
- a. Tier 2 – Tier 2 shall commence on **July 1, 2009**.

**Note**: After working closely with its counterparts at the European Commission and carefully considering stakeholder comments, EPA has moved the effective date of Version 1.1 from April 1, 2009 to **July 1, 2009**. Version 1.0 requirements will be in effect until June 30, 2009 under this proposal. Stakeholders are encouraged to provide feedback on the effective date.

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- B. Elimination of Grandfathering: EPA will not allow grandfathering under this Version 1.1 ENERGY STAR specification. **ENERGY STAR qualification under previous Versions is not automatically granted for the life of the product model**. Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time of manufacture of the product.

- 746 7) **Future Specification Revisions:** EPA reserves the right to change the specification should  
747 technological and/or market changes affect its usefulness to consumers, industry, or the environment.  
748 In keeping with current policy, revisions to the specification are arrived at through stakeholder  
749 discussions and would commence approximately 2 years from the effective date of Tier 2. EPA will  
750 periodically assess the market in terms of energy efficiency and new technologies. As always,  
751 stakeholders will have an opportunity to share their data, submit proposals, and voice any concerns.  
752 EPA will strive to ensure that the specification recognizes the most energy-efficient models in the  
753 marketplace and reward those manufacturers who have made efforts to further improve energy  
754 efficiency. Some of the issues to consider addressing in the next specification include:  
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- 756 A. Color Testing: Based on submitted test data, future consumer preferences, and engineering  
757 advancements, EPA may modify this specification at some point in the future to include color  
758 imaging in the test method.  
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  - 760 B. Recovery Time: EPA will closely monitor incremental and absolute recovery times as reported by  
761 partners testing to the TEC method, as well as partner-submitted documentation regarding  
762 recommended default delay settings. EPA will consider modification of this specification to  
763 address recovery time should it become apparent that manufacturer practices are resulting in user  
764 disabling of power management modes.  
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  - 766 C. Addressing OM Products Under TEC: Based on submitted test data, opportunities for greater  
767 energy savings, and engineering advancements, EPA may modify this specification at some point  
768 in the future to address products that are currently treated by the OM approach under the TEC  
769 approach, including Large-format and Small-format products, as well as products that employ IJ  
770 technology.  
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  - 772 D. Additional Energy Impacts: EPA has received significant interest from stakeholders to consider a  
773 broader mix of energy related impacts (i.e., embodied energy, consumables, packaging) in future  
774 versions of this ENERGY STAR specification. EPA is interested in receiving stakeholder input on  
775 evaluating means of addressing this interest in a way that aligns with ENERGY STAR's guiding  
776 principles and fully expects to provide for future significant stakeholder engagement during this  
777 process.

**Note:** Because of the consumables inherent in their operation, imaging products are unique among ENERGY STAR product categories. At the request of some stakeholders, EPA is considering whether and how, for the purposes of Tier 2, to account for the energy associated with the consumables. Stakeholders are encouraged to provide comment on this issue and suggestions in terms of an approach.

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- 779 E. Reporting Data at 230V: EPA may consider that for those products marketed in different markets,  
780 one of which includes a 230V market, data from testing at the 230V level should be acceptable as  
781 sufficient for the multiple markets. This suggestion is based on the observation that if a product  
782 meets the 230V specs, it will meet the standards at the lower voltage levels.  
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  - 784 F. Expanding Duplexing Requirements: EPA may re-assess the presence of duplexing on the  
785 current range of products, and consider how the optional requirements could be made more  
786 stringent. Revisiting the duplexing requirements to result in greater coverage of duplexing would  
787 potentially result in reduced paper usage, which has been found to be the largest life cycle impact  
788 of a printer.  
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  - 790 G. Revising TEC Test Procedure: EPA may revisit the TEC test methodology to make usage  
791 assumptions more transparent or add requirements to the specification that power consumption  
792 be measured and reported in some distinct modes that would allow for values which are relevant  
793 to actual usage patterns.

**Note:** Based on stakeholder feedback, EPA has included these sections on addressing additional energy impacts and revisiting reporting requirements, duplexing, and the TEC test procedure. Stakeholders are encouraged to provide comment on this section.

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