



1
2
3
4
5

ENERGY STAR® Program Requirements for Imaging Equipment – **Draft 1**

Table of Contents

6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

Partner Commitments	2
Commitment.....	2
Performance for Special Distinction.....	3
Eligibility Criteria	4
Definitions.....	4
Qualifying Products.....	8
Energy-Efficiency Specifications for Qualifying Products.....	10
ENERGY STAR Eligibility Criteria – TEC	10
ENERGY STAR Eligibility Criteria – OM	12
Test Procedures.....	14
User Interface.....	16
Effective Date.....	16
Future Specification Revisions.....	16



47
48
49
50
51
52

ENERGY STAR® Program Requirements for Imaging Equipment – Draft 1

Partner Commitments

53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103

Commitment

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

- 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 (e.g., Tier 1 or 2) in effect at that time;
- provide clear and consistent labeling of ENERGY STAR qualified imaging equipment. The ENERGY STAR mark must be clearly displayed on the top/front of product, on product packaging, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed;
- update the list of ENERGY STAR qualified imaging equipment models through the Online Product Submittal tool (OPS) on a quarterly basis. 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. Partner must provide quarterly updates in order to remain on the list of participating product manufacturers. If no new models are introduced during a particular quarter, 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. Unit shipment data must be 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 the United States (non-US). Partner is also encouraged to provide total unit shipments for each model in its product line, and 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 party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. Any information used will be masked by EPA so as to protect the confidentiality of the Partner;
- notify EPA of a change in the designated responsible party or contacts for imaging equipment within 30 days.

104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146

Performance for Special Distinction

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

- consider energy efficiency improvements in company facilities and pursue the ENERGY STAR label for buildings;
- purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes;
- ensure the power management feature is enabled for all ENERGY STAR qualified monitors in use in company facilities, particularly upon installation and after service is performed;
- provide general information about ENERGY STAR to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified product models;
- feature the ENERGY STAR mark on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web-Based Tools for Partners (available in the Partner Resources section on the ENERGY STAR Web site at www.energystar.gov), EPA may provide links where appropriate to the Partner Web site;
- provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event;
- provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.



ENERGY STAR® Program Requirements for Imaging Equipment – Draft 1

Eligibility Criteria (Version 1.0)

153

154

155

Below is the (Version 1.0) 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.

156

157

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

158

159

Products

160

161

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. This definition is intended to cover products that are marketed as copiers.

163

164

165

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. This definition is intended to cover products that are marketed as digital duplicators.

166

167

168

169

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 may also be via computer network or the Internet. The product may also be capable of producing hard copy duplicates, sometimes referred to as “convenience copying.” The unit must be capable of being powered from a wall outlet. This definition is intended to cover products that are marketed as fax machines.

171

172

173

174

175

176

177

178

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. This definition is intended to cover products that are marketed as mailing machines.

180

181

182

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. This definition is intended to cover products that are marketed as MFDs.

184

185

186

187

188

189

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 camera). The unit must be capable of being powered from a wall outlet. This definition is intended to cover products that are marketed as printers, including printers that can be upgraded into MFDs.

190

191

192

193

194

195

G. **Scanner** – A commercially available imaging product that functions as an electro-optical device for converting information into electronic images that can be stored, edited, converted, or transmitted, primarily in a personal computing environment. This definition is intended to cover products that are marketed as scanners.

196

197

198

199

200

201

202

203

Note to Industry: The preceding definitions mandate that products are powered through wall outlets, with the exception of scanners, which may be USB powered. EPA is open to considering a similar exception for other products that may be powered by USB connections. Industry is invited to submit information on products that are planned to use USB power connections in the future, as well as these products' power consumption. In addition, stakeholders are encouraged to suggest if they believe that Power Over Ethernet will become more common in the next few years and should be addressed in this specification.

Marking Technologies

- H. Direct Thermal (DT) – A marking technology that transfers an image by burning dots onto coated media as it passes over a heated print head. DT printers do not use ribbons.
- I. Dye Sublimation (DS) – A marking technology where images are formed by depositing (subliming) dye onto the print media based upon the amount of energy delivered by the heating elements.
- J. Electrophotography (EP) – A marking technology characterized by illumination of a photoconductor in a pattern representing the desired hard copy image via a light source, development of the image with particles of toner using the latent image on the photoconductor to define the presence or absence of toner at a given location, transfer of the toner to the final hard copy medium, and fusing to cause the desired hard copy to become durable. Types of EP include Laser, LED, and LCD. Color EP is distinguished from monochrome EP in that toners of at least two different colors are available in a given product at one time. Two types of color EP technology are defined below:
 - a. Parallel Color EP – A marking technology that uses multiple light sources and multiple photoconductors to increase the maximum color printing speed.
 - b. Serial Color EP – Serial color EP is distinguished from parallel color EP in that a single photoconductor is used in a serial fashion with one or multiple light sources to achieve the multi-color hard copy output.
- K. Impact – A marking technology characterized by the formation of the desired hard copy image by transferring colorant from a “ribbon” to the media via an impact process. Two types of impact technology include Dot Formed Impact and Fully-formed Impact.
- L. Ink Jet (IJ) – A marking technology where images are formed by depositing colorant in small drops directly to the print media in a matrix manner. Color IJ is distinguished from monochrome IJ in that more than one colorant is available in a product at any one time. Types of IJ include Piezo-electric (PE) IJ, IJ Sublimation, and Thermal IJ.
- M. Solid Ink (SI) – A marking technology where solid ink sticks are melted in the print head and jetted directly onto the media as it passes over the product’s drum.
- N. Thermal Transfer (TT) – A marking technology where the desired hard copy image is formed by depositing small drops of solid colorant (usually colored waxes) in a melted/fluid state directly to the print media in a matrix manner. TT is distinguished from IJ in that the ink is solid at room temperature and is made fluid by heat.

Operational Modes and Activities

- O. Active – The power state in which the product is connected to a power source and is actively producing output, as well as performing any of its additional functions. The power requirement in this mode is typically greater than the power requirement in all other modes.
- P. Automatic Duplex Mode – The mode in which a copier, fax machine, MFD, or printer automatically places images on both sides of an output sheet, without manual manipulation of originals or output as an intermediate step. Examples of this are one-sided to two-sided copying, or two-sided to two-sided copying. A product is considered to have an automatic duplex mode only if the model

- 263 includes all accessories needed to satisfy the above conditions, e.g., an automatic document
264 feeder.
265
- 266 Q. Default Delay Time – The time set by the manufacturer prior to shipping that determines when the
267 product will enter a low-power mode.
268
- 269 R. Disconnect – The condition where the product has been unplugged and is physically disconnected
270 from the mains.
271
- 272 S. Hard Off – The condition where the product is still plugged into but has been physically
273 disconnected from the mains. This mode is usually engaged by the consumer via a “hard off
274 switch,” which breaks the electrical circuit between the product and the mains. While in this mode,
275 a product will not draw any electricity and by definition, will measure 0 watts when metered.
- 276 T. Off – The power state that the product enters when it has been manually or automatically switched
277 off but is still plugged into and connected to the mains. This mode is exited when stimulated by an
278 input, such as a manual power switch or clock timer to bring the unit into Ready mode. When this
279 state is resultant from an automatic or predetermined stimuli, it is referred to as Auto-off.
280
- 281 U. Ready – The condition that exists when the product is not producing output, has reached
282 operating conditions, has not yet entered into any low power modes, and is ready to return to
283 Active mode with minimal delay. All product features can be enabled in this mode, and the
284 product must be able to return to Active mode by responding to any potential input options
285 designed into the product. Potential inputs include external electrical stimulus (e.g., network
286 stimulus, fax call, or remote control) and direct physical intervention (e.g., activating a physical
287 switch or button).
288
- 289 V. Sleep – The reduced power state that the product automatically enters, without actually turning
290 off, after a period of inactivity. All product features can be enabled in this mode and the product
291 must be able to return to Active mode by responding to any potential input options designed into
292 the product; however, there may be a delay. Potential inputs include external electrical stimulus
293 (e.g., network stimulus, fax call, remote control) and direct physical intervention (e.g., activating a
294 physical switch or button). The product must maintain all network connections while in Sleep,
295 waking up only as necessary.
296
- 297 W. Standby – The lowest power consumption mode which cannot be switched off (influenced) by the
298 user and that may persist for an indefinite time when the product is connected to the main
299 electricity supply and used in accordance with the manufacturer’s instructions¹. Standby usually
300 occurs in Off mode, however, may occur in Ready, Sleep, or Hard Off.
301

302 **Product Size Formats**

- 303
- 304 X. Continuous Form – Products categorized as Continuous Form include those which do not use a
305 cut-sheet media size, and are designed for key industrial applications such as printing of bar
306 codes, labels, receipts, waybills, invoices, airline tickets or retail tags.
307
- 308 Y. Large Format – Products categorized as Large Format include A2 and larger.
309
- 310 Z. Small Format – Products categorized as Small Format include media sizes smaller than those
311 defined as Standard (e.g., A6, 4” x 6”, microfilm).
312
- 313 AA. Standard – Products categorized as Standard include the following – Letter, Legal, Ledger, A3,
314 and A4.

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

315 **Additional Terms**

316
317 BB. Accessory – An optional piece of peripheral equipment that is not necessary for the operation of
318 the base unit, but that may be added before or after shipment in order to add new functionality. An
319 accessory may be sold separately under its own model number, or sold with a base unit as part of
320 a package or configuration.

321
322 CC. Digital Front-end (DFE) – A physically separate but functionally integrated computer that acts as
323 an interface to imaging equipment, which uses its own dc power supply and is ac-mains
324 connected.

325
326 *Note to Industry: Based on discussions with stakeholders, EPA recognizes that there is no*
327 *simple way to differentiate DFEs and print controllers, considering how closely related these two*
328 *devices are to one another. As products become increasingly multifunctional, defining a*
329 *distinction becomes more difficult. The definitions presented in this Draft 1 document incorporate*
330 *previously submitted stakeholder feedback; however, additional feedback from stakeholders on*
331 *the best way to define and distinguish these devices is welcomed.*

332
333
334 DD. Duplex Speed – Product speed while in duplex output mode, as determined and advertised by the
335 manufacturer.

336
337 EE. Operational Mode (OM) Approach – A method of testing and comparing the energy performance
338 of imaging equipment products, which focuses on product energy consumption in various low-
339 power modes. The key criteria used by the OM approach are values for low-power modes,
340 measured in Watts. Detailed information can be found in the “ENERGY STAR Qualified Imaging
341 Equipment Operational Mode Test Procedure” available at www.energystar.gov/products.

342
343 FF. Print Controller – An internal, embedded controller, which communicates with the host
344 computer(s) or other input device(s) (e.g., digital camera), when receiving a print job. A print
345 controller draws its dc power from the imaging equipment with which it operates.

346
347 GG. Product Speed – In general, for Standard-size products, a single A4 or 8.5” x 11” sheet
348 printed/copied/scanned on one side in a minute is equal to one image-per-minute (ipm). For
349 mailing machines, one piece of mail processed in a minute is equal to one mail-piece-per-minute
350 (mppm). For Small-format products, a single A6 or 4” x 6” sheet printed/copied/scanned on one
351 side in a minute is equal to 0.25 ipm. For Large-format products, a single A2 sheet is 4 ipm and
352 one A0 sheet is equivalent to 16 ipm. Other page sizes may be converted similarly. In cases
353 where energy-efficiency criteria is provided based on product speed, the appropriate speed to
354 consider is detailed in the test procedures, referenced in Section 4.

355
356 *Note to Industry: EPA intends to compare the energy efficiency of Continuous Form printers*
357 *against Standard-size printers employing similar marking technologies and/or functionalities. As*
358 *such, industry is invited to suggest a calculation method for converting image speeds of*
359 *Continuous Form printers to equivalent A4 image speeds.*

360
361
362 HH. Typical Electricity Consumption (TEC) Approach – A method of testing and comparing the energy
363 performance of imaging equipment products, which focuses on the typical electricity consumed
364 by a product while in normal operation during a representative period of time. The key criteria of
365 the TEC approach for imaging equipment is a value for typical weekly electricity consumption,
366 measured in kilowatt-hours (kWh). Detailed information can be found in the “ENERGY STAR
367 Qualified Imaging Equipment Typical Electricity Consumption Test Procedure” available at
368 www.energystar.gov/products.

369

370
 371
 372
 373
 374
 375
 376

- 2) **Qualifying Products:** In 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.

Qualifying Products: Table 1 - TEC Approach

Product Area	Marking Technology	Size Format	Color Capability	TEC Table	Page
Copiers	Direct Thermal	Standard	Monochrome	TEC 1	10
	Dye Sublimation	Standard	Color & Monochrome	TEC 1	10
	EP	Standard	Monochrome	TEC 1	10
	EP (Parallel)	Standard	Color	TEC 3	10
	EP (Serial)	Standard	Color	TEC 2	10
	Solid Ink	Standard	Color	TEC 3	10
	Thermal Transfer	Standard	Color	TEC 3	10
	Thermal Transfer	Standard	Monochrome	TEC 1	10
Digital Duplicators	Stencil	Standard	Color & Monochrome	TEC 4	11
Fax Machines	Direct Thermal	Standard	Monochrome	TEC 5	11
	Dye Sublimation	Standard	Monochrome	TEC 5	11
	EP	Standard	Monochrome	TEC 5	11
	EP (Serial)	Standard	Color	TEC 5	11
	Thermal Transfer	Standard	Color & Monochrome	TEC 5	11
Multifunction Devices (MFDs)	Direct Thermal	Standard	Monochrome	TEC 6	11
	Dye Sublimation	Standard	Color & Monochrome	TEC 6	11
	EP	Standard	Monochrome	TEC 6	11
	EP (Parallel)	Standard	Color	TEC 8	11
	EP (Serial)	Standard	Color	TEC 7	11
	Solid Ink	Standard	Color	TEC 8	11
	Thermal Transfer	Standard	Color	TEC 8	11
	Thermal Transfer	Standard	Monochrome	TEC 6	11
Printers	Direct Thermal	Standard	Monochrome	TEC 9	11
	Dye Sublimation	Standard	Color & Monochrome	TEC 9	11
	EP	Standard	Monochrome	TEC 9	11
	EP (Parallel)	Standard	Color	TEC 11	12
	EP (Serial)	Standard	Color	TEC 10	12
	Solid Ink	Standard	Color	TEC 11	12
	Thermal Transfer	Standard	Color	TEC 11	12
	Thermal Transfer	Standard	Monochrome	TEC 9	11

377

378
379
380

Qualifying Products: Table 2 – Operational Mode Approach

Product Area	Marking Technology	Size Format	Color Capability	OM Table	Page
Copiers	Direct Thermal	Large	Monochrome	OM 1	12
	Dye Sublimation	Large	Color & Monochrome	OM 1	12
	EP	Large	Monochrome	OM 1	12
	EP (Parallel)	Large	Color	OM 1	12
	EP (Serial)	Large	Color	OM 1	12
	Solid Ink	Large	Color	OM 1	12
	Thermal Transfer	Large	Color & Monochrome	OM 1	12
Fax Machines	Ink Jet	Standard	Color & Monochrome	OM 2	12
Mailing Machines	Direct Thermal	N/A	Monochrome	OM 4	13
	EP	N/A	Monochrome	OM 4	13
	Ink Jet	N/A	Monochrome	OM 4	13
	Thermal Transfer	N/A	Monochrome	OM 4	13
Multifunction Devices (MFDs)	Direct Thermal	Large	Monochrome	OM 1	12
	Dye Sublimation	Large	Color & Monochrome	OM 1	12
	EP	Large	Monochrome	OM 1	12
	EP (Parallel)	Large	Color	OM 1	12
	EP (Serial)	Large	Color	OM 1	12
	Ink Jet	Standard	Color & Monochrome	OM 2	12
	Ink Jet	Large	Color & Monochrome	OM 3	13
	Solid Ink	Large	Color	OM 1	12
Thermal Transfer	Large	Color & Monochrome	OM 1	12	
Printers	Direct Thermal	Continuous Form	Monochrome	OM 5	13
	Direct Thermal	Large	Monochrome	OM 7	14
	Dye Sublimation	Continuous Form	Color & Monochrome	OM 5	13
	Dye Sublimation	Large	Color & Monochrome	OM 7	14
	Dye Sublimation	Small	Color & Monochrome	OM 8	14
	EP	Continuous Form	Color & Monochrome	OM 5	13
	EP	Large	Monochrome	OM 7	14
	EP (Parallel)	Large	Color	OM 7	14
	EP (Parallel)	Small	Color	OM 8	14
	EP (Serial)	Large	Color	OM 7	14
	EP (Serial)	Small	Color	OM 8	14
	Impact	Continuous Form & Standard	Color & Monochrome	OM 6	14
	Ink Jet	Large	Color & Monochrome	OM 3	13
	Ink Jet	Continuous Form, Small & Standard	Color & Monochrome	OM 2	12
	Solid Ink	Large	Color	OM 7	14
	Solid Ink	Small	Color	OM 8	14
	Thermal Transfer	Continuous Form	Color & Monochrome	OM 5	13
	Thermal Transfer	Large	Color & Monochrome	OM 7	14
Thermal Transfer	Small	Color	OM 8	14	
Scanners	N/A	Large & Standard	N/A	OM 9	14

381
382
383
384
385
386
387

Note to Industry: In the preceding tables, EPA proposes the product types that should be evaluated to the TEC and OM approaches. EPA has attempted to outline the most plausible product types that exist in today's market as well as those that are likely to be found over the next several years. It is intended that this summary will assist stakeholders in more easily navigating this specification. EPA welcomes suggestions on omissions, or implausible product and marking technology combinations that do not need to be distinctly identified.

388 3) **Energy-Efficiency Specifications for Qualifying Products:** Only those products listed in Section 2
389 above that meet the following criteria may qualify as ENERGY STAR. Effective dates are provided in
390 Section 6 of this specification.
391

392 Products Sold with an External Power Adapter: Imaging equipment products using a single voltage
393 external ac-dc or ac-ac power adapter must use an ENERGY STAR qualified power adapter.
394 The ENERGY STAR specification for single voltage external ac-dc and ac-ac power supplies may be
395 found at www.energystar.gov/products.
396

397 Products Designed to Operate with a DFE: If an imaging equipment product is sold with an externally
398 powered DFE, the DFE must be ENERGY STAR qualified according to the ENERGY STAR eligibility
399 criteria for computers. The ENERGY STAR specification for computers may be found at
400 www.energystar.gov/products.
401

402 Products Sold with an Additional Cordless Handset: Additional cordless handsets that are sold with
403 fax machines or MFDs with fax capability must be ENERGY STAR qualified according to the
404 ENERGY STAR eligibility criteria for telephony products. The ENERGY STAR specification for
405 telephony products may be found at www.energystar.gov/products.
406

Note to Industry: The following criteria tables are divided into a number of categories based on product type, size format, and marking technology. If this level of differentiation is not necessary based on the data received, EPA will be pleased to collapse some of the tables and further combine certain groups of products.

412
413 A. **ENERGY STAR Eligibility Criteria – TEC.** To qualify as ENERGY STAR, the TEC value
414 obtained for imaging equipment outlined in Section 2, Table 1 above must not exceed the
415 corresponding criteria below.
416

417 TEC Table 1
418

Product(s): Copiers
Size Format(s): Standard-size
Marking Technologies: Color DS, DT, Mono DS, Mono EP, Mono TT

419
420 **Eligibility Criteria TBD**
421

422
423 TEC Table 2
424

Product(s): Copiers
Size Format(s): Standard-size
Marking Technologies: Serial Color EP

425
426 **Eligibility Criteria TBD**
427

428
429 TEC Table 3
430

Product(s): Copiers
Size Format(s): Standard-size
Marking Technologies: Color TT, Parallel Color EP, SI

431
432 **Eligibility Criteria TBD**
433

Note to Industry: EPA intends to separate Serial and Parallel Color EP products in the specification if the product test data supports this distinction. If differentiation is not necessary based on the data received, Color EP will be addressed as a single marking technology. Collapsing categories in this way could occur for copiers, MFDs, and/or printers.

438 TEC Table 4

439

Product(s): Digital Duplicators
Size Format(s): Standard-size
Marking Technologies: Color Stencil, Mono Stencil

440

441

442

443

444

445

TEC Table 5

Product(s): Fax Machines
Size Format(s): Standard-size
Marking Technologies: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Serial Color EP

446

447

448

449

450

451

TEC Table 6

Product(s): MFDs
Size Format(s): Standard-size
Marking Technologies: Color DS, DT, Mono DS, Mono EP, Mono TT

452

453

454

455

456

457

TEC Table 7

Product(s): MFDs
Size Format(s): Standard-size
Marking Technologies: Serial Color EP

458

459

460

461

462

463

TEC Table 8

Product(s): MFDs
Size Format(s): Standard-size
Marking Technologies: Color TT, Parallel Color EP, SI

464

465

466

467

468

469

TEC Table 9

Product(s): Printers
Size Format(s): Standard-size
Marking Technologies: Color DS, DT, Mono DS, Mono EP, Mono TT

470

471

472

Eligibility Criteria TBD

473
474

TEC Table 10

Product(s): Printers
Size Format(s): Standard-size
Marking Technologies: Serial Color EP

475
476
477
478
479
480

Eligibility Criteria TBD

TEC Table 11

Product(s): Printers
Size Format(s): Standard-size
Marking Technologies: Color TT, Parallel Color EP, SI

481
482
483
484
485
486
487
488
489
490

Eligibility Criteria TBD

- 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.

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, Serial Color EP, Parallel Color EP, SI				
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Auto-off (W)	Standby (W)
TBD	TBD	TBD	TBD	1

491
492
493
494
495
496
497
498
499
500
501
502
503

Note to Industry: EPA recognizes that products shipped with network connectivity may not be able to achieve a one-watt Standby power consumption criterion when used in a networked environment. However, EPA also recognizes that many products that are shipped with network connectivity are not used in a networked environment after purchase. In anticipation of the latter case, EPA believes that these products' design should allow for achieving a one-watt Standby power criterion when not on a network. EPA welcomes feedback from stakeholders on how best to delineate these two cases such that the appropriate products are held to the one-watt Standby power criterion.

OM Table 2

Product(s): Printers, Fax Machines, MFDs			
Size Format(s): Continuous Form, Standard-size, Small Format			
Marking Technologies: Color IJ, Mono IJ			
	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
Base Model	TBD	TBD	1
Optional Function 1	TBD	TBD	1
Optional Function 2	TBD	TBD	1
Optional Function Xn	TBD	TBD	1

504

505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523

Note to Industry: In the ENERGY STAR Imaging Equipment Directional Draft, dated February 10, 2004, EPA proposed an energy-efficiency criterion for Ink Jet printers that was not based on speed. Some stakeholders suggested that this proposed criterion for Ink Jet products would unfairly disadvantage higher functionality and/or higher speed products. To address this concern, the first draft OM test procedure put forth a method for measuring and reporting a consistent "ENERGY STAR speed," which could provide a reliable basis for comparing products.

As an alternative to differentiating Ink Jet products based on product speed, EPA is considering a new stakeholder proposal to evaluate these products based on functionality. Using this method, certain additional features (e.g., network capability, scanning, etc.) are given a specific amount of additional power consumption, as shown in OM Tables 2 and 3. Feedback on this possible approach as an alternative or compliment to differentiating based on speed is welcomed. Stakeholders are encouraged to submit specific information to demonstrate which features require additional power allowances, and reasonable amounts of additional power needed.

OM Table 3

Product(s): Printers, MFDs			
Size Format(s): Large Format			
Marking Technologies: Color IJ, Mono IJ			
	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
Base Model	TBD	TBD	1
Optional Function 1	TBD	TBD	1
Optional Function 2	TBD	TBD	1
Optional Function Xn	TBD	TBD	1

524
525
526
527

OM Table 4

Product(s): Mailing Machines			
Size Format(s): N/A			
Marking Technologies: DT, Mono EP, Mono IJ, Mono TT			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

528
529
530
531
532
533
534
535
536

Note to Industry: As noted in the ENERGY STAR Imaging Equipment Directional Draft, dated February 10, 2004, EPA has a limited data set from which to develop energy-efficiency criteria for the mailing machine product category. To ensure that the breadth of this market is addressed when setting criteria, EPA welcomes additional data from industry.

OM Table 5

Product(s): Printers			
Size Format(s): Continuous Form			
Marking Technologies: Color DS, Color EP, Color TT, DT, Mono DS, Mono EP, Mono TT			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

537
538

539
540

OM Table 6

Product(s): Printers			
Size Format(s): Standard-size, Continuous Form			
Marking Technologies: Color Impact, Mono Impact			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

541
542
543
544
545
546
547
548
549
550
551
552

Note to Industry: Some stakeholders have asked EPA to create a category for Continuous Form printers. As this is a new media size, EPA has limited data on these products' energy performance. Additionally, as mentioned on page 7, it will be necessary to develop a method of speed comparison to evaluate these products with other types of printers, and to modify the OM test procedure to accommodate the differences in these products, as appropriate. EPA encourages industry feedback on these elements, and on the appropriateness of including these products in ENERGY STAR.

OM Table 7

Product(s): Printers			
Size Format(s): Large Format			
Marking Technologies: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Parallel Color EP, Serial Color EP, SI			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

553
554
555
556

OM Table 8

Product(s): Printers			
Size Format(s): Small Format			
Marking Technologies: Color DS, Color TT, Mono DS, Parallel Color EP, Serial Color EP, SI			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

557
558
559
560

OM Table 9

Product(s): Scanners			
Size Format(s): Standard-size, Large Format			
Marking Technologies: N/A			
Product Speed (ipm)	Sleep (W)	Default Time to Sleep (min.)	Standby (W)
TBD	TBD	TBD	1

561
562
563
564
565
566

567
568
569

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

570 ▪ “Test Conditions and Equipment for Determining the ENERGY STAR Qualification Status of
571 Imaging Equipment Products.”

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

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

580
581 Additional testing and reporting requirements are provided below.

582
583 A. Number of Units Required for Test: Testing shall be conducted by the manufacturer or its
584 authorized representative on a single unit of a model. If the TEC or OM test results fall within X%
585 of the eligibility criteria level in any mode, two additional units of the same model must also be
586 tested. Manufacturers shall report values for all three units. To qualify as ENERGY STAR, all
587 three units must meet the ENERGY STAR specification.

588
589 *Note to Industry: EPA would like to further develop Section 4.A to specify details for testing
590 additional models to ensure unit (i.e., model-to-model) accuracy, if initial test findings are within a
591 specified range of the ENERGY STAR requirements. Since the TEC test procedure is somewhat
592 time-intensive, EPA is striving to balance the need for accuracy with the desire to prevent
593 unnecessary burden on manufacturers performing the test. Therefore, feedback on how best to
594 ensure unit accuracy is welcomed.*

595
596
597 B. Submittal of Qualified Product Data to EPA: Partners are required to self-certify those product
598 models that meet the ENERGY STAR guidelines and report information to EPA. The information
599 to be reported for products is outlined in the TEC and OM test procedures.

600
601 In addition, partners must submit to EPA excerpts from product literature that explains to
602 consumers the recommended default delay-times to power management settings. The intent of
603 this requirement is to support that products are being tested as shipped and recommended for
604 use.

605
606 C. Models Capable of Operating at Multiple Voltage/Frequency Combinations: Manufacturers shall
607 test their products based on the market(s) in which the models will be sold and promoted as
608 ENERGY STAR qualified. EPA and its ENERGY STAR Country Partners have developed the
609 following table with three voltage/frequency combinations for testing purposes:

Supply Voltage:	North America/Taiwan:	115 Volts AC, 60 Hz
	Europe/Australia/New Zealand:	230 Volts AC, 50 Hz
	Japan:	100 Volts AC, 50 Hz/60 Hz

610
611 For products that are sold as ENERGY STAR in multiple international markets and therefore rated
612 at multiple input voltages, the manufacturer must test at and report the required power
613 consumption or efficiency values at all relevant voltage/frequency combinations. For example, a
614 manufacturer that is shipping the same model to the United States and Europe must measure,
615 meet the specification, and report test values at both 115 Volts/60 Hz and 230 Volts/50 Hz in order
616 to qualify the model as ENERGY STAR in both markets. If a model qualifies as ENERGY STAR
617 at only one voltage/frequency combination (e.g., 115 Volts/60 Hz), then it may only be qualified
618 and promoted as ENERGY STAR in those regions that support the tested voltage/frequency
619 combination (e.g., North America and Taiwan).

622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680

- 5) **User Interface:** Manufacturers are strongly recommended to design products in accordance with IEEE P1621: 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 1.0 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 February 28, 2007.
- A. **Qualifying and Labeling Products under Version 1.0:** The Version 1.0 specification shall commence on March 1, 2007. All products, including models originally qualified under previous imaging equipment specifications, with a **date of manufacture** on or after **March 1, 2007**, must meet the new (Version 1.0) 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. **Digital Duplicators** – The Version 1.0 specification becomes effective for digital duplicators on **March 1, 2006**, which is one year earlier than the effective date for all other imaging equipment product categories.

Note to Industry: Digital duplicator manufacturers have asked EPA for an earlier effective date for this product category, as digital duplicators are currently unable to qualify for ENERGY STAR. Since digital duplicator manufacturers are willing to be early adopters of this specification, EPA is pleased to permit them to qualify their energy-efficient models under Version 1.0 as soon as the specification is finalized.

- B. **Elimination of Grandfathering:** EPA will not allow grandfathering under this Version 1.0 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.

Note to Industry: Some ENERGY STAR industry stakeholders have asked EPA for a special allowance for remanufactured machines under the Version 1.0 specification. In order to avoid potential market confusion (in terms of what it means to qualify as ENERGY STAR at any given point in time), EPA is reluctant to allow remanufactured products to meet a less stringent specification after the new one goes into effect. However, in order to minimize any disincentive to remanufacturing that might result, EPA is considering a tiered approach for relevant subclasses of products. This would phase in the effective date more gradually for the entire subclass to allow more time for remanufactured product platform redesign. To this end, EPA is interested in additional information from stakeholders in terms of 1) which product subclasses in particular raise remanufacturing issues, 2) what is a reasonable date by which at least one platform redesign, anticipating the new specification, could occur so that qualifying remanufactured products could be made available, and 3) what interim improvement in terms of efficiency could be made on existing platforms to improve remanufactured product platforms short of a total redesign.

- 7) **Future Specification Revisions:** EPA reserves the right to change the 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. EPA will periodically assess the market in terms of energy efficiency and new technologies. As always, stakeholders will have an opportunity to share their data, submit proposals, and voice any concerns. EPA will strive to ensure that the specification recognizes the most energy-

681 efficient models in the marketplace and reward those manufacturers who have made efforts to further
682 improve energy efficiency.

- 683
- 684 A. Color Testing: Based on submitted test data, future consumer preferences, and engineering
685 advancements, EPA may modify this specification at some point in the future to include color
686 imaging in the test method.
- 687
- 688 B. Recovery Time: EPA will closely monitor incremental and absolute recovery times as reported by
689 partners testing to the TEC method, as well as partner-submitted documentation regarding
690 recommended default delay settings. EPA will consider modification of this specification to
691 address recovery time should it become apparent that manufacturer practices are resulting in user
692 disabling of power management modes.
- 693
- 694 C. Universal TEC Approach: One year after this specification's effective date, EPA will consider if the
695 OM approach continues to achieve energy savings. EPA reserves the right to consider a
696 universal TEC approach in the future.