

Additional Guidance and Clarification Regarding the ENERGY STAR Imaging Equipment Functional Adder Approach for Operational Mode (OM) Products and Electronic Labeling

In response to the questions and comments received from stakeholders regarding the Functional Adder approach and the electronic labeling option presented in the ENERGY STAR Draft 3 Imaging Equipment Specification (Version 1.0), EPA has prepared this additional guidance to clarify these components of the specification. This document provides the following information for stakeholder consideration:

- **Key changes to the functional-adder approach** that will be reflected in the Final Draft specification;
- **Additional guidance on how to apply the functional-adder approach**, including more details on each type of adder and when each allowance may be applied; and
- **Minimum guidelines for electronic labeling.**

EPA will include much of the clarification provided in this document in the Final Draft specification, which is scheduled for distribution on April 21, 2006, and in the Final OM test procedure. Stakeholders are asked to submit any outstanding comments on the Functional Adder approach and/or the electronic labeling proposal **by April 28, 2006**. EPA will distribute the Final Version 1.0 Imaging Specification on May 3, 2006.

Guidance on the Functional Adder Approach

Summary of Changes

The following are changes to the functional-adder approach that will be reflected in the Final Draft specification:

- Ringtone Cancellation. This adder will be removed from the Final Draft due to stakeholder comments indicating that this power allowance is not needed. EPA did not receive sufficient supporting rationale from industry as to why an allowance for this capability is necessary.
- Wireless Interface. A Primary allowance will be added for wireless capability in the Final Draft. 3 W will be allotted for products with wireless communication used as the principal interface.
- Infrared Interface. A Primary allowance will be added for infrared capability in the Final Draft. This Primary distinction will be provided to be more consistent with the other Interface adders, since all types of interfaces are assumed capable of remaining active during the imaging product's Sleep mode. However, the infrared interface will have the same amount of power allotted as either a Primary or a Secondary interface, since it is assumed that the only functionality required of the infrared during Sleep is the ability to wake the imaging product.
- Fax. This adder will be removed from the Final Draft for the following two reasons: 1) to better equalize the treatment of fax machines and printers in the specification, and 2) to remain consistent with the OM test procedure. Since fax machines in Draft 3 were given an adder for the scanner and an adder for the phone line, this may have the unintended consequence of penalizing printers, which have neither of these capabilities, but do have print capability. Rather than create a "print capability subtractor," which would have manufacturers subtract a certain amount of power from products that do not have print capability, EPA has determined that removing the fax adder would be the preferable option. Additionally, the OM test procedure directs manufacturers to test fax machines via convenience copying, without a phone line connected. EPA considers it very unlikely that many fax machines are offered in the market without the capability to print or make convenience copies. Finally, EPA has not received sufficient supporting rationale for allowing an adder for fax machines or for revising the test procedure to include a plugged-in phone line. Thus, the Final Spec will not include an adder for fax capability.

- **Maximum of two Primary interfaces.** In the Draft 3 specification, EPA allowed for the possibility that a product may have multiple Primary interfaces and corresponding power allowances, since the product must be tested in its “as-shipped” configuration. In the Final Draft specification, products will be limited to **two** Primary functional adder allowances. This may require that manufacturers be allowed to disable certain interfaces that would otherwise be active during the imaging product’s Sleep mode during the test. Limiting the number of Primaries in this way should help maintain consistency in how similar products are measured and evaluated.

Clarified Functional Adder Table

The Qualifying Products Table 3, which provides the functional adder types and allowances under the OM approach in Section 3.B. of the Version 1.0 specification, is provided below. This clarified table has been expanded to include a clear description of each adder type and a list of known interfaces/functions that meet the description.

Qualifying Products: Table 3 – OM Functional Adders

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
Interfaces	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, RS232, and IEEE 1284/Parallel/Centronics ports.		
	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 ports.		
	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.			
Other	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	-	2.0
	The presence of a scanner that uses Cold Cathode Fluorescent Lamp (CCFL) technology. This adder is applied only once, regardless of the lamp size or the number of lamps/bulbs employed.		
	Scanners with non-CCFL lamps	-	0.5

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
	The presence of a scanner that uses a lamp technology other than CCFL. This adder is applied only once, regardless of the lamp size or the number of lamps/bulbs employed. This adder addresses scanners using Light-Emitting Diode (LED), Halogen, Xenon, or Tubular Fluorescent (TL) technologies.		
	PC-based system (cannot print/copy/scan without use of significant PC resources)	-	-0.5
	This adder applies to imaging products that rely on an external computer for significant 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) [Note: this adder does not apply to scanners]	-	For PSOR > 10 W, 0.05 x (PSOR – 10 W)
	This adder applies to all imaging products except for scanners. The allowance is calculated from the internal or external power supply's rated DC output as specified by the power supply manufacturer. (It is not 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 $0.05 \times (36 - 10) = 0.05 \times 26 = 1.3$ 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 3.475 W.		

Interfaces

The adder allowances specific to interface types are presented as interface Types A through G in the first half of the Qualifying Products Table 3. Manufacturers should consider only the interfaces that are available on a product in its as-shipped configuration. Options available to the consumer after the product is shipped or interfaces that are present on the product's externally-powered digital front-end (DFE) should not be considered when applying allowances to the imaging product.

Products may have multiple interfaces available and, thus, may receive multiple allowances according to Table 3. However, interfaces that perform multiple functions should only be considered once. For example, a USB connection that operates as both 1.x and 2.x may be counted only once and given a single allowance. When a particular interface may fall under more than one interface Type according to the table, the manufacturer should choose the function that the interface is primarily designed to perform when determining the appropriate adder allowance. For example, a USB connection on the front of the imaging product that is marketed as a PictBridge or "camera interface" in product literature should be considered a Type E interface rather than a Type B interface. Similarly, a memory-card-reader slot that supports multiple formats may only be counted once. Further, a system that supports more than one type of 802.11 may count as only one wireless interface.

For wired interface types, the data rate is the raw bit rate of the interface; useful data transfer is generally lower than this due to packet overheads and other factors.

For products with more than one instance of a wired interface (e.g., two USB ports), these interfaces should be considered as unique and separate interfaces. For example, a product might have two USB ports. One of these ports may be designated as Primary and the other as Secondary during the test, according to the definitions for Primary and Secondary, and thus, power allowances should be given accordingly. In this case, a total of 0.7 W is given for the two interfaces (0.5 W and 0.2 W). Further guidance on the Primary and Secondary designations is provided below in the subsection entitled "Primary vs. Secondary Interfaces."

The interface types provided in Table 3 include types that are offered on products in the market today as well as those that EPA believes are likely to be included in future products. Following the release of the Final Version 1.0 specification, manufacturers should contact EPA for guidance if a particular type of interface is not included in this table.

Primary vs. Secondary

For interface Types A through G in Qualifying Products Table 3, each interface type is given either a Primary or Secondary classification. This designation refers to the state in which the interface is required to remain while the imaging product is in Sleep. Connections that remain active during the OM test procedure while the imaging product is in Sleep are defined as Primary, while connections that can be inactive while the imaging product is in Sleep are defined as Secondary.

In the Final Draft specification, products will be limited to **two** primary functional adder allowances. This may require that manufacturers be allowed to disable certain interfaces that would otherwise be active during the imaging product's Sleep mode during the test. Following are examples of connections that are considered Primary while the imaging product is in Sleep:

- A USB port that continues to communicate with a computer or network via the USB connection;
- An 802.11 interface that keeps the imaging product visible to at least one other 802.11 product in the vicinity; and
- A card interface that has a card present.

When considered a Primary adder, an interface must be capable of active processing simultaneously with the imaging product and other Primary adders. For example, an imaging product that has two Primary memory-card slots must be capable of reading from both memory-card slots at the same time. A manufacturer with an imaging product that can only read from one memory card at a time may not count both card slots as Primary, but rather, must count one as Primary and one as Secondary.

Other

The Other category of functional adders in Qualifying Products Table 3 addresses product functionality (e.g., interfaces, disk storage) that requires power while the imaging product is in Sleep, but which is not included in the Interfaces category. The following functions within the Other category are given allowances where they apply: scanner lamps, especially those that must be maintained during Sleep for the purpose of product responsiveness (e.g., those that use CCFL technology); storage; memory; and the ability to receive and transmit signals to cordless handsets.

Guidance on the Electronic Labeling Option

The Draft 3 Imaging Equipment Specification (Version 1.0) stated that 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 (i.e., 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.

As noted above, manufacturers have the option of using electronic labeling in place of the physical product labeling requirement if it is pre-approved by EPA. EPA has received feedback from manufacturers requesting greater detail regarding what is acceptable to EPA for meeting the electronic labeling option. It has been suggested that a set of minimum requirements would help streamline the labeling process, and would minimize the number of cases that would require a case-by-case EPA review process.

In response, EPA has developed the following minimum guidelines for electronic labeling:

- The ENERGY STAR mark in cyan, black, or white (as described in "The ENERGY STAR Identity Guidelines" available at www.energystar.gov/logos), appears at system start-up. The electronic mark will display for a minimum of 10 seconds, unless the product turn-on process does not allow this. In this case the mark should show for as much time as possible, but for no less than 5 seconds; and
- The ENERGY STAR mark must be at least 10% of screen size, may not be smaller than 76 pixels x 78 pixels, and must be legible.

EPA will consider alternative proposals for electronic labeling on a case-by-case basis.