



# ENERGY STAR® Program Requirements Product Specification for Audio/Video

## Eligibility Criteria Draft 2 Version 3.0

1 Following is the Version 3.0 product specification for ENERGY STAR qualified Audio/Video products. A  
2 product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

### 3 **1 DEFINITIONS**

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5 A) AV Product: A mains-connected product that offers Audio Amplification and/or Optical Disc Player  
6 functions.

7 **Note**: References to “Dedicated Audio DSP” have been removed from this specification. There does not  
8 appear to be an active market for the ENERGY STAR label for DSPs, since no DSP devices have been  
9 submitted for ENERGY STAR qualification since the release of the Version 2.0 specification.

10 B) Auto Power Down (APD): The capability to automatically switch a device from On Mode to Sleep  
11 Mode after a predetermined period of time (APD timing) has elapsed. APD timing begins when both:  
12 1) The device has ceased performance of all Primary Functions, and  
13 2) The last user input has been received (e.g., remote control signal, volume adjustment).  
14 If either a Primary Function resumes or a user input is received, the APD timing will reset. The intent  
15 of APD is that products will automatically power down into Sleep Mode when they are not being  
16 adjusted by the user and are not performing a Primary Function.

17 **Note**: The definition of Auto Power Down has been modified slightly for clarity. The intent of Auto Power  
18 Down is to transition the product from On Mode to Sleep Mode when it is not in use. This means that a  
19 product should Auto Power Down if it is not performing any function (i.e., playing music) and the user is  
20 not interacting with it. EPA is open to clarifying this definition even further if stakeholders still find the  
21 definition misleading or have additional suggestions. EPA would like to further clarify that Sleep Mode  
22 does not require that all monitoring of input channels must cease. It is very conceivable that a device  
23 could enter a low power state after the timeout and then exit the low power state when a signal is once  
24 again received on the input. Additionally, when a product is in the Idle State, it is not required to have the  
25 amplifier circuitry engaged if it can be turned on and off without user noticeable latencies.

26 **Example 1**: A DVD player is by definition performing a Primary Function during active video playback  
27 from the disc; and thus is not required to APD for the duration of active video playback. The same DVD  
28 player is expected to power down to Sleep Mode within the APD time setting when video content  
29 playback concludes, such that the product does not indefinitely remain in On Mode while in a disc menu  
30 screen.

31 **Example 2**: An amplifier that is playing music is performing a Primary Function and thus is not required to  
32 APD. Once the music has stopped playing, and the user is not interacting with the product, the product  
33 will be expected to power down.

34 C) Loss of Signal (LOS):

35 1) For audio signals, LOS is defined as:

- 36 a) Analog Inputs: Signal dropping below that required for MUP by a factor of not less than  
37 30dB and not more than 70dB.

38 **Note:** The definition of Loss of Signal has been modified for additional clarity. The intent of this definition  
39 is to provide guidance on what constitutes a lost signal and ensure that signal noise will not interfere with  
40 the Auto Power Down function.

- 41 b) HDMI: Receive <Inactive Source> or <Standby> signal over the CEC channel, or [Power  
42 Status] of an upstream device goes to “Standby” or “In Transition to Standby” over the  
43 CEC channel;
- 44 c) Other Digital Inputs (e.g., Ethernet): No audio information in the data stream; or  
45 d) Detectable cable disconnects.
- 46 2) For video signals, LOS is defined as:
- 47 a) Analog Inputs: Loss of either the horizontal or vertical sync signal  
48 b) HDMI: Receive <Inactive Source> or <Standby> signal over the Consumer Electronics  
49 Control (CEC) channel, or [Power Status] of an upstream device goes to “Standby” or “In  
50 Transition to Standby” over the CEC channel; or detection of a disabled TMDS link, a  
51 TMDS clock line signal below 22.5 MHz for more than one second, or a TMDS link  
52 operating outside of the valid frequency range;
- 53 c) DVI: Detection of a disabled TMDS link, a TMDS clock line signal below 22.5 MHz for  
54 more than one second, or a TMDS link operating outside of the valid frequency range;
- 55 d) Other Digital Inputs (e.g., Ethernet): No video information in the data stream; or  
56 e) Detectable cable disconnects.
- 57 D) Primary Function: Any discrete, dynamic device function that can be perceived by an end user,  
58 including the delivery or processing of audio/video content, and excluding the following:
- 59 1) Continuous device functions (e.g., clocks, Status Displays, indicator lamps),  
60 2) Static device functions, such as:
- 61 a) No active audio or video processing or output;  
62 b) Playback paused or stopped;  
63 c) No optical disc media in disc drive; or  
64 d) Waiting in disc menu or other menu for user input.
- 65 E) Operational Modes:
- 66 1) On Mode: Where the product is connected to a mains power source, has been activated and  
67 is capable of providing one or more Primary Functions. The common terms “active”, “in-use”  
68 and “normal operation” also describe this mode.
- 69 a) Active State: A state within On Mode in which a product is performing a Primary Function.  
70 b) Idle State: A state within On Mode in which a product is not performing a Primary  
71 Function and no content is actively being delivered to the end-user.
- 72 2) Sleep Mode: Where the product is connected to a mains power source, is incapable of  
73 providing a Primary Function, and offers one or more of the following user oriented or  
74 protective functions which may persist for an indefinite time. The common term “standby”  
75 may also describe this mode.
- 76 a) To facilitate the activation of other modes (including activation of On Mode) by remote  
77 switch (including remote control), internal sensor, or timer;  
78 b) Continuous function: information or Status Displays including clocks;

79 c) Continuous function: sensor-based functions.

80 For purposes of this specification, Sleep Mode is defined as the condition where the product  
81 is connected to a power source, produces neither sound nor picture, neither transmits nor  
82 receives program information and/or data (excluding data transmitted to change the unit's  
83 condition from Sleep Mode to On Mode), and is waiting to be switched to On Mode by a  
84 direct or indirect signal from the consumer (e.g., with the remote control).

85 3) Off Mode: Where the product is connected to a mains power source, is not providing any On  
86 Mode or Sleep Mode functions, and cannot be switched into any other mode except by user  
87 actuation of a manual power switch. An indicator that only shows the user that the product is  
88 in the off position is included within the classification of an Off Mode.

89 **Note:** EPA supports the current draft of IEC 62542, which defines modes of operation for global use, and  
90 intends to revise this specification to adopt the definitions therein once that standard has been finalized.

91 F) External Power Supply (EPS): Also referred to as External Power Adapter. A component contained in  
92 a separate physical enclosure external to the AV Product, designed to convert line voltage AC input  
93 from the mains to lesser DC voltage(s) in order to provide power to the AV Product. An EPS connects  
94 to the AV Product via a removable or hard-wired male/female electrical connection, cable, cord or  
95 other wiring.

96 G) High-Definition Multimedia Interface (HDMI): A compact audio/video interface for transmitting  
97 uncompressed digital data.

98 1) Consumer Electronics Control (CEC) Protocol: A single-conductor wire or bus technology that  
99 is an optional feature in the HDMI specification. CEC is meant to carry IR/remote and/or  
100 control commands between interconnected HDMI devices.

101 H) High Definition Resolution (HD): Video output with resolution greater than 480 lines (480 i/p).

102 I) Standard Definition Resolution (SD): Video output with resolution less than or equal to 480 lines  
103 (480 i/p).

104 J) Multi-component System: A product consisting of several components with separate enclosures that  
105 are sold as and intended for use as a single system. A "Home Theater in a Box" is an example of a  
106 Multi-component System.

107 K) Audio Amplifier Type Classifications:

108 1) Full-spectrum Audio Amplifier: An amplifier capable of full audible frequency range (20 Hz to  
109 20 kHz) output on all channels.

110 2) Limited-bandwidth Audio Amplifier: An amplifier limited to less than full audible frequency  
111 range (20 Hz to 20 kHz) output on one or more channels.

112 L) Product Functions:

113 1) Audio Amplification: A function by which a device increases the amplitude of an audio signal  
114 for purposes of sending the signal to a transducer for playback.

115 2) Audio Signal Processing: A function by which a device modifies an audio signal for a purpose  
116 other than amplification.

117 3) High Resolution Display: A function by which a device converts a video signal into a visual  
118 output (e.g., LCD panel, plasma display panel). This definition does not include Status  
119 Displays.

- 120 4) Status Display: A function by which a product provides a visual display of less than 480x234  
 121 pixel resolution or 5 inches diagonal screen size, including a back-lit alphanumeric clock or  
 122 channel indicator. This definition does not include single indicator lamps.<sup>1</sup>
- 123 5) IP Video Tuner: A function by which a device can play back streaming digital video content  
 124 packetized or downloaded over an IP network.
- 125 6) Networking / Control Protocol: A function by which a device can connect to a network for  
 126 transmission and receipt of data. The connection may be wired or wireless (e.g., Wi-Fi,  
 127 Ethernet, Bluetooth, RS-232, USB).
- 128 7) Optical Disc Player / Recorder: A function by which a device can read and/or write data to  
 129 removable disk media (e.g., CD, DVD, Blu-ray Disc).
- 130 M) Total Harmonic Distortion (THD): The ratio of the sum of the powers of all harmonic components to  
 131 the power of the fundamental frequency of a signal.
- 132 N) Maximum Undistorted Power (MUP): The amplifier output power at which the THD of any output  
 133 channel is 1.0% or greater for a given input.
- 134 O) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject  
 135 to the same ENERGY STAR qualification criteria, and (3) of a common basic design. Product models  
 136 within a family differ from each other according to one or more characteristics or features that either  
 137 (1) have no impact on product performance with regard to ENERGY STAR qualification criteria, or (2)  
 138 are specified herein as acceptable variations within a Product Family. For Audio/Video, acceptable  
 139 variations within a Product Family include:
- 140 1) Color, and  
 141 2) Housing.

## 142 2 SCOPE

### 143 2.1 Included Products

- 144 2.1.1 Products that meet the definition of an AV Product as specified herein are eligible for ENERGY  
 145 STAR qualification, with the exception of products listed in Section 2.2.

### 146 2.2 Excluded Products

- 147 2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible for  
 148 qualification under this specification. The list of specifications currently in effect can be found at  
 149 [www.energystar.gov/specifications](http://www.energystar.gov/specifications).
- 150 2.2.2 The following products are excluded from qualification under this specification.
- 151 i. Products whose primary video playback capability is via IP Video Tuner and which are sold or  
 152 provided outside of a dedicated service contract,
- 153 ii. Primarily battery-powered products (e.g., MP3 players, portable DVD players, portable  
 154 gaming systems),
- 155 iii. Products for use in automotive applications,
- 156 iv. Video projectors,
- 157 v. Home and building automation and control products,
- 158 vi. Whole-house and whole-building audio and/or video systems,
- 159 vii. Videoconferencing systems,

<sup>1</sup> Note that single indicator lamps are not provided power allowances under this specification.

- 160 viii. Wireless microphone systems,
- 161 ix. A/B selector switches,
- 162 x. Media servers.

### 163 3 QUALIFICATION CRITERIA

#### 164 3.1 Significant Digits and Rounding

- 165 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.
- 166 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using directly  
167 measured or calculated values without any benefit from rounding.
- 168 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR  
169 website shall be rounded to the nearest significant digit as expressed in the corresponding  
170 specification limit.

#### 171 3.2 General Qualification Criteria

- 172 3.2.1 External Power Supply: If the product is shipped with an EPS, the EPS shall meet the level V  
173 performance requirements under the International Efficiency Marking Protocol and include the  
174 level V marking. Additional information on the Marking Protocol is available at  
175 [www.energystar.gov/powersupplies](http://www.energystar.gov/powersupplies).
- 176 3.2.2 Multi-component Systems: On Mode and Sleep Mode power limits for each power-consuming  
177 component in a Multi-component System shall be assessed independently. To qualify for  
178 ENERGY STAR, each component shall meet applicable ENERGY STAR criteria.
- 179 3.2.3 Networking / Control Protocols: To qualify for ENERGY STAR, AV Products that offer one or  
180 more Networking / Control Protocol options shall meet all applicable ENERGY STAR criteria in all  
181 possible control protocol configurations.

#### 182 3.3 Auto Power Down (APD) Requirements

- 183 3.3.1 APD functionality shall be available on all products except those that are subject to 3rd-party  
184 performance standards that prohibit APD, including those used for Mass Notification and  
185 Emergency Communications Systems and those subject to ANSI/UL 2572.
- 186 3.3.2 APD functionality shall be enabled by default, with APD timing less than or equal to 2 hours,  
187 subject to the following exceptions:
  - 188 i. Products may offer users the option (e.g., via system menu or physical switch) to modify APD  
189 timing in 10 minute intervals, or to disable APD entirely.
  - 190 ii. Products may initiate APD immediately upon receipt of authoritative control instruction via an  
191 active Networking / Control Protocol.
- 192 3.3.3 APD Timing Default Settings shall be as follows:
  - 193 i. APD Timing  $\leq$  30 minutes: This timing option is acceptable for use as a default setting. If APD  
194 timing is set by default to no more than 30 minutes and APD cannot be disabled or increased  
195 to greater than 30 minutes, products do not have to meet Idle State power requirements.
  - 196 ii. 30 minutes  $<$  APD Timing  $\leq$  2 hours: This timing option is acceptable for use as a default  
197 setting. If APD can be disabled, or if APD timing can be set to greater than 30 minutes,  
198 products shall meet Idle State power requirements.
  - 199 iii. APD Timing  $>$  2 hours: This timing option may only be enabled by the end user and is not  
200 available for use as a default setting. If APD can be disabled, or if APD timing can be set to  
201 greater than 30 minutes, products shall meet Idle State power requirements.

202 **3.4 Sleep Mode Requirements**

203 3.4.1 Measured Sleep Mode power ( $P_{SLEEP}$ ) shall be less than or equal to the Maximum Sleep Mode  
 204 Power Requirement ( $P_{SLEEP\_MAX}$ ), as calculated per Equation 1.

- 205 i. If a product's Idle State meets the Sleep Mode power requirements, a distinct and separate  
 206 Sleep Mode is not required to be implemented.

207 **Equation 1: Calculation of Maximum Sleep Mode Power Requirement**

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$$P_{SLEEP\_MAX} = P_{SLEEP\_BASE} + \sum_{i=1}^n P_{WAKE\_i}$$

209 Where:

- 210 ▪  $P_{SLEEP\_MAX}$  is the Maximum Sleep Mode Power Requirement;
- 211 ▪  $P_{SLEEP\_BASE}$  is the base Sleep Mode power allowance for all  
 212 products, as specified in Table 1;
- 213 ▪  $P_{WAKE\_i}$  is the Sleep Mode power allowance for each active, in-use  
 214 networking/control protocol that provides remote hosts with the  
 215 capability to wake the product from Sleep Mode, as specified in  
 216 Table 1, for a total of  $n$  such allowances.

217 **Table 1: Sleep Mode Power Allowances**

Product Function	Sleep Mode Power Allowance (watts)
Base Allowance for All Products ( $P_{SLEEP\_BASE}$ )	1.0
In-use Networking / Control Protocol with Wake Capability ( $P_{WAKE\_i}$ )	1.0

218 **3.5 On Mode Requirements**

219 3.5.1 Measured On Mode power ( $P_{ON}$ ), shall be less than or equal to the Maximum On Mode Power  
 220 requirement ( $P_{ON\_MAX}$ ), as calculated per Equation 2, subject to the following requirements:

- 221 i. Measured On Mode power for Optical Disc Players capable of processing both SD and HD  
 222 video content shall be the average of the On Mode power when processing SD content and  
 223 the On Mode power when processing HD content, as measured per the test procedure.
- 224 ii. On Mode power allowances specified in Table 2 shall be applied for each instance of an  
 225 applicable product function, with the exception of the Optical Disc Player. Only one Optical  
 226 Disc Player allowance may be applied per product.
- 227 iii. The Networking / Control Protocol On Mode power allowance shall be applied only to active,  
 228 in-use Networking / Control Protocols.

229 **Equation 2: Calculation of Maximum On Mode Power Requirement**

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$$P_{ON\_MAX} = P_{ON} + \sum_{i=1}^n P_{ADD\_i}$$

231 Where:

- 232 ▪  $P_{ON\_MAX}$  is the Maximum On Mode Power Requirement, in watts
- 233 ▪  $P_{ON}$  is the On Mode power base allowance for each applicable  
 234 product function listed in Table 2, Note: only one  $P_{ON}$  is  
 235 applicable for each tested function of a product.

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- $P_{ADD_i}$  is the On Mode Power Function Adder for each applicable product function listed in Table 3, rounded to the nearest 0.1 watts, for a total of  $n$  such allowances.

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**Table 2: On Mode Power Base Allowances**

Product Function	On Mode Power Allowance, $P_{ON}$ (watts)
SD or Audio Source Optical Disc Player: Playback Test	6.0
SD Source to HD Output "Upconversion" Optical Disk Player: Playback Test	10.0
HD Source Optical Disc Player: Playback Test	10.5

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**Note:** EPA is proposing a reduction in the On Mode power allowance for Blu-Ray disc players from the current limit of 15.0 watts to 10.5 watts. An analysis of EPA's current data set supports a good selection of products from a range of manufacturers that would be available and cost effective at this level. Given the comparatively low market share of ENERGY STAR qualified standard or upconversion capable DVD players and their overall decline in the market, EPA is proposing to retain existing requirements for these products at 6.0 watts and 10.0 watts respectively. EPA welcomes feedback on these proposed On Mode power requirements as well as any additional data that stakeholders would like to share.

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EPA has removed the requirements for recording to optical discs. This function is not represented in our dataset nor does EPA feel that the market for this type of function is significant. EPA welcomes feedback on this proposal.

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**Table 3: On Mode Power Function Adders**

Product Function	On Mode Power Allowance, $P_{ADD_i}$ (watts)
High Resolution Display	$P_{ON} = (6.0 \times R) + (0.05 \times A) + 3.0$ <p>Where:</p> <p>R is the display resolution (x * y) in megapixels</p> <p>A is the viewable screen area in square inches</p>
In-use Networking / Control Protocol	1.0
Audio Amplification	5.0
<i>Where:</i> $P_{OUT}$ is the output power at 1/8 MUP with 1kHz sinusoidal input	$P_{OUT} \leq 50.0$ watts $P_{OUT} > 50.0$ watts $(0.10 \times P_{OUT})$

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**Note:** To ensure a level playing field, EPA proposes an adjustment to the structure of the ENERGY STAR On Mode Power requirements for products with both Optical Disc Players and Audio Amplification such as Home Theater in a Box products. EPA has added an Audio Amplification adder to the On Mode Power function adders to address the idle power of the Audio Amplification circuitry while the Optical Disc Player is being tested.

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**Example:** The Maximum On Mode power requirement for an AV Product with an integrated display, HD Blu-ray Disc player, and an active Ethernet network connection would be calculated as follows:

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(1) The HD Optical Disc Player would receive 10.5 watts during playback;

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(2) A display with 480 x 234 pixel resolution (0.112320 MP) and a 7 inch diagonal screen (viewable area of 20.9 square inches), would receive  $[(6 \times 0.112320) + (0.05 \times 20.9)] + 3.0 = 4.7$  watts; and

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(3) The Ethernet connection would receive 1.0 watts. The On Mode power limit during playback of video content from the disc would be  $10.5 \text{ W} + 4.7 \text{ W} + 1.0 \text{ W} = 16.2$  watts.

### 265 3.6 Idle State Requirements

266 3.6.1 Measured Idle State power ( $P_{IDLE}$ ), shall be less than or equal to the Maximum Idle State Power  
267 requirement ( $P_{IDLE\_MAX}$ ), as calculated per Equation 3, subject to the following requirements:

268 i. Products with a default APD timing less than or equal to 30 minutes and that cannot be  
269 disabled or increased to greater than 30 minutes shall be excluded from the requirement.

#### 270 Equation 3: Calculation of Maximum Idle State Power Requirement

271 
$$P_{IDLE\_MAX} = \sum_{i=1}^n P_{IDLE\_i}$$

272 Where:

- 273 ▪  $P_{IDLE\_MAX}$  is the Maximum Idle State Power Requirement, in watts
- 274 ▪  $P_{IDLE\_i}$  is the Idle State power allowance for each applicable  
275 product function listed in Table 4, for a total of  $n$  such  
276 allowances.

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**Table 4: Idle State Power Allowances**

Product Function		Idle State Power Allowance, $P_{IDLE\_i}$ (watts)
Base (All Products)		5.0
Audio Amplification  Where: $P_{OUT}$ is the output power at 1/8 MUP with 1kHz sinusoidal input	$P_{OUT} \leq 50.0$ watts	5.0
	$P_{OUT} > 50.0$ watts	$(0.10 \times P_{OUT})$

### 279 3.7 Amplifier Efficiency Requirements

280 3.7.1 Measured amplifier efficiency ( $\eta$ ) of products that offer Audio Amplification, as calculated per  
281 Equation 4, shall be greater than or equal to the On Mode amplifier efficiency requirements  
282 specified in Table 5.



- 283 i. If no AV inputs are available and the Optical Disc Player is used for audio signal input (per  
 284 ENERGY STAR test method Section 5.E), the power consumption from the Optical Disc  
 285 Player,  $P_{DISC}$ , as measured in Section 8.3 of the test procedure, may be subtracted from the  
 286 total measured power consumption of the device for all audio amplifier efficiency calculations.
- 287 ii. If the amplifier is tested with an AV input, then  $P_{DISC} = 0$

288 **Equation 4: Calculation of Amplifier Efficiency**

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$$\eta = \frac{P_{OUT}}{P_{IN} - P_{DISC}}$$

290 *Where:*

- 291 ▪  $\eta$  is the amplifier efficiency
- 292 ▪  $P_{OUT}$  is the output power at 1/8 MUP with 1 kHz sinusoidal input,  
 293 in watts
- 294 ▪  $P_{IN}$  is the input power at 1/8 MUP with 1 kHz sinusoidal input, in  
 295 watts
- 296 ▪  $P_{DISC}$  is the power measured during the audio playback test in the  
 297 test method for products without AV inputs that must rely on an  
 298 Optical Disc Player for audio signal input.  
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300 **Table 5: Amplifier Efficiency Requirements**

Amplifier Input Power at 1/8 MUP with 1 kHz Sinusoidal Input, $P_{IN}$ (W)	Version 3.0 Minimum Amplifier Efficiency, $\eta$
$P_{IN} < 20$	N/A
$20 \leq P_{IN} < 100$	0.44
$P_{IN} \geq 100$	0.55

301 **Note:** Through additional research and discussions with stakeholders, EPA has concluded that amplifiers  
 302 qualified to the Version 2.1 performance levels continue to represent a relatively small share of shipments  
 303 and that existing efficiency requirements remain appropriate. EPA will continue to include Small  
 304 Amplifiers in this specification to realize energy savings through the APD requirement and will continue to  
 305 work to develop efficiency requirements for this category for future revisions of this specification.

306 **3.8 Toxicity Requirements**

307 3.8.1 Audio/Video products shall contain restricted levels of the following materials, where the  
 308 maximum concentration values tolerated by weight in homogeneous materials are: lead (0.1%),  
 309 mercury (0.1%), cadmium (0.01%), hexavalent chromium (0.1%), polybrominated biphenyls  
 310 (PBB) (0.1%), or polybrominated diphenyl ethers (PBDE) (0.1%). Batteries are exempt.

311 **Note:** Consistent with the ENERGY STAR commitment to delivering energy efficiency along with the  
 312 product features and functions that consumers value, EPA would like to ensure that the ENERGY STAR  
 313 label is associated only with those products that meet minimum expectations for materials toxicity,  
 314 recyclability and recycled content where existing standards can be referenced. Adding this type of  
 315 requirement extends a longstanding ENERGY STAR practice of addressing issues such as mercury in  
 316 Compact Fluorescent Lights (CFLs) where existing standards can be leveraged. EPA anticipates that  
 317 existing reporting efforts and maintenance of relevant quality assurance documentation would be required  
 318 to demonstrate compliance with this requirement.

319 The proposed toxicity requirement and compliance approach are consistent with the European Union  
 320 RoHS Directive, which also applies to Audio/Video products. The RoHS Directive, formally known as  
 321 Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of  
 322 certain hazardous substances in electrical and electronic equipment, was amended by 2005/618/EC and  
 323 went into effect in 2006. Accordingly, products that currently meet the EU RoHS Directive would satisfy  
 324 this toxicity requirement. In some cases, the RoHS Directive allows for specific, limited exemptions for  
 325 specific materials and provides expiration dates for these exemptions. Manufacturers must demonstrate  
 326 and document the need for an exemption. EPA welcomes feedback from stakeholders to understand if  
 327 any materials exempted for a given period of time under the RoHS Directive currently apply to  
 328 components typically found in Audio/Video products. A list of the exemptions under the RoHS Directive  
 329 can be found under Annex III at the following URL:

330 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0088:0110:EN:PDF>

331 In Draft 1, EPA indicated interest in identifying standards that address recyclability and/or recycled  
 332 content for this product category. By referencing recyclability, EPA is referring to designing products to be  
 333 more recyclable (e.g., designing for ease of disassembly or using materials that can be recycled). Since  
 334 current standards that reference recyclability and/or recycled content may not be readily applicable to A/V  
 335 products, EPA will not propose including such a requirement in Version 3.0. In the next revision of the A/V  
 336 specification EPA will explore including criteria for recycled content, criteria for designing products to be  
 337 more recyclable (i.e., ease of disassembly), and criteria for packaging of products.

### 338 3.9 Safety Requirements

339 3.9.1 Audio Video equipment shall comply with applicable local product safety and market  
 340 requirements in the market(s) in which the product is to be sold.

341 **Note:** In the interest of clarity, EPA is explicitly requiring that all products comply with the relevant safety  
 342 standards as required by the markets into which each product is being sold. Products listed on the  
 343 Qualified Product list, thus sold into the North American market, must be certified by an NRTL and meet  
 344 the applicable FCC requirements.

## 345 4 TESTING

### 346 4.1 Test Methods

347 4.1.1 When testing Audio/Video products, the test methods identified in Table 6 shall be used to  
 348 determine ENERGY STAR qualification.

349 **Table 6. Test Methods for ENERGY STAR Qualification**

Product Type	Test Method
All	ENERGY STAR Test Method for Audio/Video, Rev. Nov-2011
External Power Supply	<i>Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies</i> , Aug. 11, 2004.  (Available for download from <a href="http://www.efficientpowersupplies.org">www.efficientpowersupplies.org</a> ).

### 350 4.2 Number of Units Required for Testing

351 4.2.1 Representative Models shall be selected for testing per the following requirements:

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

355 ii. For qualification of a Product Family, any product configuration within the family may be  
356 considered the Representative Model.

357 4.2.2 A single unit of each Representative Model shall be selected for testing. If test results for any  
358 operational mode power measurement are within 10% of ENERGY STAR requirements, two  
359 additional units of the same Representative Model with an identical configuration shall be tested.

360 4.2.3 All tested units shall meet ENERGY STAR qualification requirements.

### 361 4.3 International Market Qualification

362 4.3.1 Products shall be tested for qualification at the relevant input voltage/frequency combination for  
363 each market in which they will be sold and promoted as ENERGY STAR.

## 364 5 USER INTERFACE

365 5.1.1 Partners are encouraged to design products in accordance with the user interface standard IEEE  
366 P1621: Standard for User Interface Elements in Power Control of Electronic Devices Employed in  
367 Office/Consumer Environments. For details, see <http://eetd.LBL.gov/Controls>.

## 368 6 EFFECTIVE DATE

369 6.1.1 Effective Date: The Version 3.0 ENERGY STAR Audio/Video specification shall take effect on the  
370 dates specified in Table 7.

371 6.1.2 To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in  
372 effect on its date of manufacture. The date of manufacture is specific to each unit and is the date  
373 (e.g., month and year) on which a unit is considered to be completely assembled.

374 **Table 7. Specification Effective Dates**

<b>Version 3.0</b>
TBD

375  
376 6.1.3 Future Specification Revisions: EPA reserves the right to change this specification should  
377 technological and/or market changes affect its usefulness to consumers, industry, or the  
378 environment. In keeping with current policy, revisions to the specification are arrived at through  
379 stakeholder discussions. In the event of a specification revision, please note that the ENERGY  
380 STAR qualification is not automatically granted for the life of a product model.