



ENERGY STAR® Program Requirements Product Specification for Televisions

Eligibility Criteria Draft 2 Version 6.0

1 Following is the Draft 2 Version 6.0 ENERGY STAR Product Specification for Televisions. A product shall
2 meet all of the identified criteria if it is to earn the ENERGY STAR.
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4 **Note:** In January 2012, the U.S. Department of Energy (DOE) published the Test Procedure for
5 Television Sets Notice of Proposed Rulemaking (TV TP NOPR) (77 FR 2830). The ENERGY STAR
6 Specification for Televisions will ultimately reference the DOE TV Test Procedure Final Rule once it is
7 published and, in an effort to provide partners with continuity and honor the Agency's intention to
8 harmonize with the final DOE Test Method, this Draft 2 Version 6.0 proposes the use of the DOE TV TP
9 NOPR, where applicable. The ENERGY STAR specification incorporates the definitions, scope, and
10 testing requirements as outlined in the DOE TV TP NOPR, which build on, and are similar to, those of the
11 ENERGY STAR Televisions 5.3 specification.

12 Given the current high market share of ENERGY STAR qualified Televisions, EPA intends to finalize
13 Version 6.0 in March 2012, with the specification taking effect in early 2013. EPA commits to working with
14 stakeholders in the period between Draft 2 and the finalization of the specification to address any
15 differences between DOE's TV TP NOPR and ENERGY STAR's current test method. Depending on the
16 timing of the publication and the extent of any changes made in the final DOE Test Procedure, if the
17 publication of the final DOE Test Procedure does not impact qualification of products under Version 6.0,
18 EPA will issue a modification (i.e. Version 6.1), referencing the final Test Procedure. Should DOE's final
19 test method differ significantly from its TV TP NOPR, wherein the qualification of products under Version
20 6.0 is impacted, EPA will accelerate the development of a Version 7.0 such that manufacturers adhere to
21 DOE's final test method. Stakeholders are invited to submit all written comments regarding the regulatory
22 definitions and testing procedures to the public DOE Television Sets Public Docket via the Federal
23 eRulemaking Portal: <http://www.regulations.gov> (EERE-2010-BT-TP-0026) no later than April 3, 2012.

24 More information on the Department of Energy's TV TP NOPR is available at:
25 http://www1.eere.energy.gov/buildings/appliance_standards/residential/tv_sets.html

26 The DOE TV TP NOPR as published in the Federal Register is available at:
27 <http://www.gpo.gov/fdsys/pkg/FR-2012-01-19/pdf/2012-687.pdf>

28 **1 DEFINITIONS**

29 A) Product Types:

- 30 1) Television (TV): A product designed to be powered primarily by mains power having a diagonal
31 screen size of fifteen inches or larger that is manufactured with a TV tuner, and that is capable of
32 displaying dynamic visual information from wired or wireless sources including but not limited to:
- 33 a) Broadcast and similar services for terrestrial, cable, satellite, and/or broadband transmission
34 of analog and/or digital signals; and/or
 - 35 b) Display-specific data connections, such as Video Graphics Array (VGA), Digital Visual
36 Interface (DVI), High-Definition Multimedia Interface (HDMI), DisplayPort, used typically for a
37 computer or workstation that is not physically attached to the display; and/or

- 38 c) Media storage devices such as a USB flash drive, a memory card, or a DVD; and/or
- 39 d) Network connections, usually using Internet Protocol, typically carried over Ethernet or WiFi.
- 40 A TV may contain, but is not limited to, one of the following display technologies: liquid crystal
41 display (LCD), light-emitting diode (LED), cathode-ray tube (CRT), and plasma display panel
42 (PDP).
- 43 2) Rear-projection TV: A television product in which the display device is a projector that focuses
44 images onto a screen located inside the TV enclosure.
- 45 3) Direct-view TV: A television product in which the display device emits light either directly from the
46 screen surface or transmits light from a source mounted directly behind the screen.
- 47 4) TV Combination Unit: A television product in which the TV and one or more additional devices
48 (e.g., DVD player, Blu-ray Disc player, Hard Disk Drive) are combined into a single enclosure,
49 and which meets all of the following criteria:
- 50 a) it is not possible to measure the power of the individual components without removing the
51 product housing; and
- 52 b) the product connects to a wall outlet via a single power cord.
- 53 5) Component Television: A television product composed of two or more separate components
54 (e.g., display device and tuner) that is marketed and sold as a television under a single model or
55 system designation. A component television may have more than one power cord.
- 56 6) Hospitality Television: A television product which includes the following features:
- 57 a) a control port for bi-directional communication (DB-9, RJ11, RJ12, RJ45, coaxial cable, or
58 HDMI-CEC);
- 59 b) activated hospitality protocol software (e.g., SmartPort, MPI, MTI, Serial Protocol) to provide
60 direct access to Video-On-Demand (VOD) systems or a digital media player designed for
61 hospitality-specific applications; and
- 62 c) a power state that meets the definition of Download Acquisition Mode.
- 63 7) Analog Television: A television product which has an NTSC, PAL, or SECAM tuner, and may
64 have analog video inputs (e.g., composite video, component video, S-video, RGB).
- 65 8) Digital Television: A television product which has at least one digital tuner or at least one digital
66 video input (e.g., HDMI). Products with an analog tuner and both analog and digital inputs are
67 considered digital products under this specification.
- 68 B) Additional Functions: Functions that are not required for the basic operation of the device. Additional
69 functions include, but are not limited to a VCR unit, a DVD unit, a HDD unit, a FM-radio unit, a
70 memory card-reader unit, or an ambient lighting unit.
- 71 C) Home Picture Setting (or default picture setting): The picture setting which is recommended by the
72 manufacturer from the initial set up menu or the mode that the television comes shipped in if no
73 setting is recommended.
- 74 D) Retail Picture Setting: The preset picture setting in which the TV produces the highest luminance
75 during the on mode conditions.

- 76 E) Native Vertical Resolution: The physical pixel count for the vertical axis of the television (e.g., a
77 television with a screen resolution of 1920 x 1080 (horizontal x vertical) would have a native vertical
78 resolution of 1080).
- 79 F) Electronic Program Guide (EPG): An interactive on-screen menu of TV program information
80 downloaded from an external source (e.g., program time, date, descriptions).
- 81 G) External Power Supply (EPS): Also referred to as External Power Adapter. A component contained in
82 a separate physical enclosure external to the television casing, designed to convert line voltage ac
83 input from the mains to lower dc voltage(s) in order to provide power to the television. An EPS
84 connects to the television via a removable or hard-wired male/female electrical connection, cable,
85 cord or other wiring.
- 86 H) Point of Deployment (POD) Module: A conditional access module for digital cable signal reception.
- 87 I) Luminance: The photometric measure of the luminous intensity per unit area of light traveling in a
88 given direction, expressed in units of candelas per square meter (cd/m²).
- 89 J) Automatic Brightness Control (ABC): The self-acting mechanism that controls the brightness of a
90 display as a function of ambient light.
- 91 K) Operational Modes:
- 92 a) On Mode: The power mode in which the product is connected to a mains power source, has
93 been activated, and is providing one or more of its principal functions.
- 94 b) Power Overhang State: A limited-duration power state within On Mode that is intended to
95 facilitate a product's rapid return to full On Mode functionality or provide time for the product
96 to perform functions required for safe shutdown (e.g. operation of cooling fans) after being
97 switched into a low power state by the user.
- 98 2) Standby-Passive Mode: The mode in which the TV is connected to a power source, produces
99 neither sound nor picture but can be switched into another mode with the remote control unit or
100 an internal signal.
- 101 3) Standby-Active, High Mode: The mode in which the TV is connected to a power source, produces
102 neither sound nor picture but can be switched into another mode with the remote control unit or
103 an internal signal, and with an external signal, and is exchanging/receiving data with/from an
104 external source.
- 105 a) Download Acquisition Mode (DAM): The power mode in which the product is connected
106 to a mains power source, produces neither sound nor picture, and is actively
107 downloading data. Data downloads may include channel listing information for use by an
108 electronic programming guide, TV setup data, channel map updates, firmware updates,
109 monitoring for emergency messaging/communications or other network communications..
- 110 4) Standby-Active, Low Mode: The mode in which the TV is connected to a power source, produces
111 neither sound nor picture but can be switched into another mode with the remote control unit or
112 an internal signal and can additionally be switched into another mode with an external signal.
- 113 5) Off Mode: The mode where the TV is connected to a power source, produces neither sound nor
114 picture and cannot be switched into any other mode with the remote control unit, an external or
115 internal signal.

116 **Note:** The following definitions have been revised or added in this draft to align with the DOE TV TP
117 NOPR: TVs, Additional Functions, Home Picture Setting, Retail Picture Setting, Luminance, On Mode,
118 Standby-Passive Mode, Standby-Active, High Mode, Standby-Active, Low Mode, and Off Mode. EPA
119 and DOE are aware that ENERGY STAR specifications traditionally incorporate a sleep mode definition.
120 In order to be consistent with the DOE TV TP NOPR, the ENERGY STAR specification has incorporated
121 standby modes and definitions instead of sleep mode.

122 EPA and DOE welcome comments on these definitions as well as other definitions that stakeholders
123 believe are necessary.

124 L) Screen Area: The viewable screen area of the product, calculated by multiplying the viewable image
125 width by the viewable image height.

126 M) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject
127 to the same ENERGY STAR qualification criteria, and (3) of a common basic design. Product models
128 within a family differ from each other according to one or more characteristics or features that either
129 (1) have no impact on product performance with regard to ENERGY STAR qualification criteria, or (2)
130 are specified herein as acceptable variations within a product family. For Televisions, acceptable
131 variations within a product family include:

132 1) Color, and

133 2) Housing.

134 **2 SCOPE**

135 **2.1 Included Products**

136 2.1.1 Products that are (1) marketed to the consumer as a television (e.g., television is the
137 primary function), (2) capable of being powered from either a wall outlet or a battery unit
138 that is sold with an external power supply, and (3) meet one of the following product
139 type definitions, are eligible for ENERGY STAR qualification, with the exception of
140 products listed in Section 2.2:

141 i. Televisions

142 ii. Television Combination Units

143 iii. Component Televisions

144 iv. Hospitality Televisions

145 v. Products with a computer input port (e.g., VGA) that are marketed and sold primarily
146 as televisions.

147 vi. Dual-function televisions / computer monitors that are marketed and sold as dual-
148 function televisions / computer monitors.

149 **Note:** Products that are capable of being powered by a battery are not included within the scope of the
150 DOE TV TP NOPR. However, EPA seeks to retain such products in its scope of the Version 6.0 ENERGY
151 STAR specification. In this case, EPA will work with stakeholders to ensure that such products that are
152 excluded from the DOE TV TP NOPR are provided with an ENERGY STAR test method if they are not
153 able to be tested under required testing conditions put forth in the DOE TV TP NOPR. To this end, EPA
154 proposes that the ENERGY STAR test method proposed under the Draft 1 of the Version 6.0 Televisions
155 specification (which is the same as the test method for Version 5.3) be the basis for a test method for
156 products that not included in the scope of DOE TV TP NOPR.

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158 **2.2 Excluded Products**

159 2.2.1 Products that are covered under other ENERGY STAR product specifications are not
160 eligible for qualification under this specification. The list of specifications currently in
161 effect can be found at www.energystar.gov/products.

162 2.2.2 Products that satisfy one or more of the following conditions are not eligible for
163 ENERGY STAR qualification under this specification:

- 164 i. Products with a computer input port (e.g., VGA) that are marketed and sold primarily
165 as computer monitors,
- 166 ii. Products that do not have a power state meeting the definition of Standby-Passive
167 Mode (e.g., Public Alert CEA-2009-A certified models which offer 24/7/365 active
168 public alert features), with the exception of Hospitality Televisions that meet the
169 requirements specified in Section 3.7.

170 **Note:** EPA is aware of a revised Public Alert specification, CEA-2009-B, and welcomes comment on any
171 differences between the two versions, and whether the above reference should be updated.

172 **3 QUALIFICATION CRITERIA**

173 **3.1 Significant Digits and Rounding**

174 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.

175 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using
176 exact values without any benefit from further rounding.

177 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY
178 STAR website shall be rounded to the nearest significant digit as expressed in the
179 corresponding specification limit.

180 **3.2 General Requirements**

181 3.2.1 External Power Supply (EPS): If the product is shipped with an EPS, the EPS shall
182 meet the level V performance requirements under the International Efficiency Marking
183 Protocol and include the level V marking. Additional information on the Marking Protocol
184 is available at www.energystar.gov/powersupplies.

- 185 i. External Power Supplies shall meet level V requirements when tested using the Test
186 Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and
187 Ac-Ac Power Supplies, Aug. 11, 2004.

188 3.2.2 Power Management:

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Note: EPA understands that manufacturers are developing and implementing innovative power management functions for Televisions such as occupancy sensors, proximity sensors or timer functions. As additional information about these technologies becomes available, EPA is exploring ways to encourage use of such measures in ENERGY STAR Televisions. Therefore, EPA seeks additional information about these functions, their savings, and projected market presence.

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3.2.3 User Information: The product shall ship with consumer informational materials located in either (1) the hard copy or electronic user manual, or (2) a package or box insert. These materials shall include:

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- i. Information about the ENERGY STAR program,
- ii. Information on the energy consumption implications of changes to default as-shipped television configuration and settings, and
- iii. Notification that enabling certain optional features and functionalities (e.g., instant-on), may increase energy consumption beyond the limits required for ENERGY STAR qualification, as applicable.

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3.2.4 Forced Menu: Any product that includes a forced menu upon initial start-up shall:

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- i. Provide users with a choice of “home” picture mode or “retail” picture mode. Partners may use alternative terminology if approved by EPA.
- ii. Upon selection of “retail” picture mode at initial start-up, either (1) display a second prompt requiring the user to confirm the choice of “retail” picture mode, or (2) display information on the start-up menu that the “home” picture mode is the mode in which the product qualifies for ENERGY STAR. If option (2) is selected, additional detail about ENERGY STAR qualification and energy consumption expectations shall be included in printed product literature and on the product information page on the Partner’s website.

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Note: EPA is considering revising this requirement to double prompt the user anytime the television is taken out of the “home” picture mode. Based on research findings, EPA has learned that close to 50 percent of consumers may change the picture settings (e.g. to “vivid,” “sports,” “movie” modes) after purchasing a new TV. Asking users to confirm their choice of any picture mode other than “home” picture mode is intended to raise greater awareness among consumers that the “home” picture mode is the mode in which the product qualifies for ENERGY STAR and that other picture modes may not deliver the same energy savings. EPA seeks stakeholder feedback on this proposal.

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3.2.5 Component Televisions: For component television products, the total power of all components shall be considered for evaluation against any power requirement in this specification.

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3.3 On Mode Requirements

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3.3.1 For products with Automatic Brightness Control (ABC) enabled by default, On Mode power (P_{ON}), as calculated per Equation 1, shall be less than or equal to the Maximum On Mode Power Requirement (P_{ON_MAX}), as calculated per Equation 2.

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Equation 1: Calculation of On Mode Power for Products with ABC Enabled by Default

$$P_{ON_ABC} = W_{10}P_{10} + W_{50}P_{50} + W_{100}P_{100} + W_{300}P_{300}$$

Where:

- P_{ON_ABC} is the power consumed for on mode with ABC enabled;
- P_{10} is the power consumed for on mode, ABC enabled, 10 lux, with a direct light source;
- P_{50} is the power consumed for on mode, ABC enabled, 50 lux, with a direct light source;
- P_{100} is the power consumed for on mode, ABC enabled, 100 lux, with a direct light source;
- P_{300} is the power consumed for on mode, ABC enabled, 300 lux, with a direct light source;
- W_{10} is the percent weighting for on mode, ABC enabled, while the room illuminance is 10 lux;
- W_{50} is the percent weighting for on mode, ABC enabled, while the room illuminance is 50 lux;
- W_{100} is the percent weighting for on mode, ABC enabled, while the room illuminance is 100 lux;
- W_{300} is the percent weighting for on mode, ABC enabled, while the room illuminance is 300 lux;
- $W_{10} = W_{50} = W_{100} = W_{300} = 0.25$

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Note: EPA is committed to adopting the television test procedure currently under development by the U.S. Department of Energy (DOE). The ENERGY STAR Version 6.0 TV specification is planned to be finalized in March 2012 and, in the interim, while the DOE's final Test Procedure is still under development, EPA proposes using the Automatic Brightness Control test procedure as written in the DOE TV TP NOPR as a basis for testing the On Mode Power of televisions shipped with ABC active.

Once DOE's test method is final, EPA will issue a modification to Version 6.0 so that manufacturers adhere to DOE's final test method as required. To the extent that the final test method does not impact qualification of products under Version 6.0, EPA will maintain its typical revision schedule for televisions (i.e., every two years). Should revisions to the test method impact qualification, EPA will accelerate revision to the specification to ensure that under the new test, the eligibility criteria continue to align with program principles (i.e., test highlights a good selection of top performing, cost effective products).

New studies also show typical room lighting levels to be low for average TV viewing. Many homes assessed in both the CEA and CLASP studies, conducted in Fall 2011, demonstrate that viewing often occurs at or under 10 lux and under 50 lux. Therefore, while the DOE test method is not yet final, the proposed room illumination points of 10, 50, 100 and 300 lux are more representative of the light levels in viewing environments than are the 0 lux and 300 lux points found in Version 5.3.

270 In addition, EPA understands that the new ABC test method will affect the reported On Mode power of a
271 television. In order to preserve the utility of its large dataset and avoid retesting all products, EPA
272 conducted additional testing and analysis and derived a correction factor, which was used to estimate
273 how televisions tested under the old ABC test method would perform under the new method. Additional
274 information on this correction can be found in the attached document “Proposed Data Correction for
275 ABC.”

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277 3.3.2 For products that do not offer ABC, or for which ABC is not enabled by default, On
278 Mode power (P_{ON}), as measured per the ENERGY STAR test method shall be less than
279 or equal to the Maximum On Mode Power Requirement (P_{ON_MAX}), as calculated per
280 Equation 1.

281 Equation 2: Calculation of Maximum On Mode Power

$$282 P_{ON_MAX} = 100 * \tanh(0.00085 * (A - 140) + 0.052) + 14.1$$

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284 *Where:*

- 285 ▪ P_{ON_MAX} is the maximum allowable On Mode Power consumption
- 286 in W,
- 287 ▪ A is the viewable screen area of the product in square inches
- 288 ▪ \tanh is the hyperbolic tangent function

289 **Note:** EPA has developed a new proposal for calculating Maximum On Mode Power. In establishing the
290 proposed performance levels, EPA re-evaluated its data associated with nearly 1700 current and
291 previously ENERGY STAR qualified television models that stakeholders indicated are reasonably reflective
292 of the current TV market. A masked version of the dataset is attached to this distribution. The proposed
293 requirements represent the current top 15% of TVs in the EPA dataset (a dataset of 2011 models).
294 Based on this dataset, EPA has proposed 2013 performance levels intended to differentiate top
295 performers while allowing for good selection of products across all screen sizes available at a price that
296 remains cost effective.

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298 3.3.3 Measured Power Overhang state power shall be less than or equal to the Maximum On
299 Mode Power Requirement (P_{ON_MAX}), as calculated per Equation 2.

300 3.4 Standby-Passive Mode Requirements

301 3.4.1 Measured Standby Mode power ($P_{STANDBY-PASSIVE}$) shall be less than or equal to 1.0 W.

302 3.4.2 For products that offer more than one Standby Mode, the Standby Mode with the lowest
303 power consumption shall be enabled by default.

304 **Note:** The Standby Mode Requirements are intended to be the same as the requirements EPA would
305 propose under the “Sleep Mode” definition found in Draft 1 of the Version 6.0 Televisions specification.
306 EPA seeks feedback from stakeholders as to whether the definition of Standby-Passive Mode
307 corresponds to the previous definition of Sleep Mode. The two definitions are referenced below for
308 stakeholders to compare and comment:
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310 *Proposed Standby-Passive Mode (this draft, see Definitions):* “The mode in which the TV is connected to
311 a power source, produces neither sound nor picture but can be switched into another mode with the
312 remote control unit or an internal signal.”
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314 *Sleep Mode (from proposed Draft 1, Version 6.0 and finalized Version 5.3 ENERGY STAR TV*
315 *specifications):* “The power mode, sometimes referred to as “Standby,” in which the product is connected
316 to a mains power source, is not providing a principal function, and offers one or more of the following user
317 oriented or protective functions, which may persist for an indefinite time:
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- 319 a) to facilitate the activation of other modes (including activation or deactivation of On Mode) by
320 remote switch (including remote control), internal sensor, timer.
 - 321 b) continuous function: information or status displays including clocks.
 - 322 c) continuous function: sensor-based functions.
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324 Sleep Mode is defined as the time when the product is connected to a power source, produces neither
325 sound nor picture, neither transmits nor receives program information and/or data (excluding data
326 transmitted to change the unit’s condition from Sleep Mode to On Mode), and is waiting to be switched to
327 On Mode by a direct or indirect signal from the consumer (e.g., with the remote control).”
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329 EPA has amended the Standby- Passive Mode (intended to reflect the former Sleep Mode) requirement
330 to include only the default standby mode as shipped. EPA is interested in demonstrating the power use
331 of televisions in alternate standby modes, especially related to internet connectivity, thus the test
332 procedure is requiring the testing of TVs in an internet connected standby. EPA intends to gather data on
333 the power use of televisions while connected to a network and propose a limit when more information is
334 available.

335 **3.5 Luminance Requirements**

336 3.5.1 Measured peak luminance in the “home” (or default, as-shipped) picture mode (L_{HOME})
337 shall be greater than or equal to 65% of measured peak luminance in the “retail” (or
338 brightest-selectable) preset picture mode (L_{RETAIL}).

339 **Note:** EPA is aware that the DOE TV TP NOPR has changed the luminance test to require that
340 luminance in the retail picture setting is measured before being in the home picture setting. DOE has
341 found that, during testing, some TVs do not provide the ability to switch into the “retail” picture setting
342 once placed into the “home” picture setting.

343 **3.6 Download Acquisition Mode (DAM) Requirements**

344 3.6.1 A product may automatically exit Standby-Passive Mode and enter Download
345 Acquisition Mode according to a predefined schedule, in order to:

- 346 i. Download channel listing information for use by an electronic programming guide,
- 347 ii. Monitor for emergency messaging/communications, or
- 348 iii. Communicate via a network protocol.

349 3.6.2 Measured DAM energy consumption for all DAM states (E_{DAM}) shall be less than or
350 equal to 40 watt-hours per day (0.04 kWh/day).

351 **3.7 Hospitality Television Requirements**

352 3.7.1 Hospitality Television TEC (TEC_{HOSP}), as calculated per Equation 3, shall be less than
353 or equal to the Maximum Hospitality Television TEC Requirement (TEC_{HOSP_MAX}), as
354 calculated per Equation 4.

355 3.7.2 For Hospitality Televisions that feature an always-on DAM, measured DAM power
356 (P_{DAM}) shall be less than or equal to 1.0 W when tested per the Standby-Passive Mode
357 test procedures.

358 **Equation 3: Calculation of TEC for Hospitality Televisions (TEC_{HOSP})**

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$$TEC_{HOSP} = (P_{ON} \times 5) + (P_{STANDBY} \times 19) + E_{DAM}$$

360 *Where:*

- 361 ▪ TEC_{HOSP} is the calculated Hospitality Television TEC;
- 362 ▪ P_{ON} is the measured On Mode power Section 3.3;
- 363 ▪ $P_{STANDBY}$ is the measured Standby Mode power; and
- 364 ▪ E_{DAM} is the measured DAM energy over a 24 hour period.

365 **Equation 4: Calculation of Maximum TEC Requirement for**
366 **Hospitality Televisions (TEC_{HOSP_MAX})**

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$$TEC_{HOSP_MAX} = 500 * \tanh(0.00085 * (A - 140) + 0.052) + 129.5$$

368 *Where:*

- 369 ▪ TEC_{HOSP} is the calculated Hospitality Television TEC;
- 370 ▪ A is the viewable screen area of the product in square inches
- 371 ▪ \tanh is the hyperbolic tangent function

372 **3.8 Toxicity and Recyclability Requirements**

373 3.8.1 Television products shall contain restricted levels of the following materials, where the
374 maximum concentration values tolerated by weight in homogeneous materials are: lead
375 (0.1%), mercury (0.1%), cadmium (0.01%), hexavalent chromium (0.1%),
376 polybrominated biphenyls (PBB) (0.1%), or polybrominated diphenyl ethers (PBDE)
377 (0.1%). Batteries are exempt. The following exemptions are granted for components in
378 Televisions:

- 379 i. Lead in glass of fluorescent tubes not exceeding 0.2% by weight.
- 380 ii. Copper alloy containing up to 4% lead by weight.
- 381 iii. Electrical or electronic components containing lead in a glass or ceramic other than
382 dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic
383 matrix.
- 384 iv. Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250 V DC
385 or higher.

386 3.8.2 Television products shall be designed for ease of disassembly and recyclability where
387 external enclosures, sub-enclosures, chassis and electronic subassemblies are easily
388 removable with commonly available tools, by hand, or by a recycler's automated
389 processes. Products shall identify and provide ease of access to, and removal of,
390 materials with special handling needs.

391 3.8.3 For purposes of third-party certification, toxicity and recyclability requirements shall not
392 be reviewed when products are initially qualified or during subsequent verification
393 testing. Instead, consistent with the RoHS Directive (for toxicity) and IEEE 1680
394 standard (for design for recyclability), manufacturers shall maintain documentation on
395 file that products meet these requirements. EPA reserves the right to request this
396 documentation at any time.

397 3.8.4 To the extent product models are sold in countries other than the U.S., they are not
398 subject to requirements in 3.8.1, 3.8.2 and 3.8.3.

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400 **Note:** In response to stakeholder comments related to third party certification, EPA has clarified
401 that these requirements are exempt from the ENERGY STAR third-party certification process.
402 Further, also in response to stakeholder comment, EPA added language making clear that the
403 non-energy requirements proposed here are not intended for international adoption.

404 In developing these requirements, EPA seeks to avoid associating the ENERGY STAR label with
405 poor quality or otherwise undesirable products. EPA drew from existing standards for toxicity and
406 design for recyclability. EPA looked to the RoHS Directive for a toxicity limit because Television
407 manufacturers have extensive experience with designing products free from certain toxic
408 materials in compliance with RoHS. Most global manufacturers have been in compliance with
409 RoHS since 2006, when the directive first took effect. EPA drew from the IEEE 1680.1 standard
410 for the recyclability requirement because many manufacturers have years of experience with
411 design for recyclability for displays, which use virtually identical materials to those found in TVs.
412 Currently, over 700 products offered by the majority of the ENERGY STAR Partners who
413 manufacture displays meet the minimum criteria for design for recyclability under IEEE1680.1,
414 which has been in place since 2006. Further, new criteria are currently under consideration for
415 the forthcoming IEEE 1680 standard for TVs, indicating the achievable nature of the above
416 proposed requirements. Finally, many manufacturers and retailers share over a decade of
417 experience with TV recycling, thus likely generating an understanding as to which materials or
418 designs are more easily disassembled or recyclable.

419 EPA intends to harmonize with the RoHS Directive by adding language in Section 3.8 allowing
420 the same exemptions as those outlined in the current RoHS Directive. EPA continues to seek
421 stakeholder assistance in identifying all exemptions applicable to TVs. The exemptions proposed
422 in this section are harmonized with exemptions 5(b), 6(c), 7(c)-I. and 7(c)-II in the revised RoHS
423 Directive. Additionally, EPA is requesting feedback on whether the exemption in the revised
424 RoHS Directive (#39) for "cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm² of light-
425 emitting area) for use in solid state illumination or display systems" (due to expire July 1, 2014) is
426 applicable to TVs. EPA does not intend to require documentation of the need for exemption
427 beyond what is needed by the Partner to demonstrate compliance with the RoHS Directive.

428 **4 TESTING**

429 **4.1 Test Methods**

430 4.1.1 When testing Television products, the test methods identified in Table 1 shall be used
431 to determine ENERGY STAR qualification.

432

Table 1: Test Method for ENERGY STAR Qualification

Product Type	Test Method
Ac Mains-powered Televisions	The proposed test method is available in a Notice of Proposed Rulemaking published in the Federal Register 77 FR 2864. Once effective, the DOE test procedure adopted will be found in 10 CFR § 430 Appendix H.
Battery-powered Televisions	ENERGY STAR Test Method for Televisions, Rev. Aug-201

433

434 **Note:** EPA is committed to adopting the television test procedure currently under development by the
 435 U.S. Department of Energy. In an effort to provide partners with certainty now and honor the Agency’s
 436 intention to harmonize with the final DOE Test Method, this Draft 2 Version 6.0 proposes the use of the
 437 DOE TV TP NOPR. The DOE TV TP NOPR references test methods found in the ENERGY STAR TV
 438 Version 5.3 specification: *ENERGY STAR Test Methods for Televisions, Rev. Aug-2011*; *IEC 62087, Ed.*
 439 *3.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment*; *IEC*
 440 *62301, Ed. 2.0: Household Electrical Appliances – Measurement of Standby Power*; *CEA: Procedure for*
 441 *DAM Testing.*

442
 443 Battery-powered televisions are excluded from the scope of the DOE TV TP NOPR. Therefore, EPA
 444 proposes that the ENERGY STAR test method proposed under the Draft 1 of the Version 6.0 Televisions
 445 specification (which is the same as the test method for Version 5.3) be used for these products.

446 **4.2 Number of Units Required for Testing**

447 4.2.1 Representative Models shall be selected for testing per the following requirements:

- 448 i. For qualification of an individual product model, a product configuration equivalent to
- 449 that which is intended to be marketed and labeled as ENERGY STAR is considered
- 450 the Representative Model;
- 451 ii. For qualification of a product family, any product configuration within the family may
- 452 be considered the Representative Model.

453 **4.3 International Market Qualification**

454 4.3.1 Products shall be tested for qualification at the relevant input voltage/frequency
 455 combination for each market in which they will be sold and promoted as ENERGY
 456 STAR.

457 **5 USER INTERFACE**

458 5.1.1 Partners are encouraged to design products in accordance with the user interface
 459 standard IEEE 1621: Standard for User Interface Elements in Power Control of
 460 Electronic Devices Employed in Office/Consumer Environments. For details, see
 461 <http://eetd.LBL.gov/Controls>.

462 **6 EFFECTIVE DATE**

463 6.1.1 Effective Date: The Version 6.0 ENERGY STAR Televisions specification shall take
464 effect on [TBD]. To qualify for ENERGY STAR, a product model shall meet the
465 ENERGY STAR specification in effect on its date of manufacture. The date of
466 manufacture is specific to each unit and is the date (e.g., month and year) on which a
467 unit is considered to be completely assembled.

468 **Note:** At this time EPA anticipates finalizing Version 6.0 in early Spring 2012, where the specification
469 would then become effective in early 2013.

470

471 6.1.2 Future Specification Revisions: EPA reserves the right to change this specification
472 should technological and/or market changes affect its usefulness to consumers,
473 industry, or the environment. In keeping with current policy, revisions to the
474 specification are arrived at through stakeholder discussions. In the event of a
475 specification revision, please note that the ENERGY STAR qualification is not
476 automatically granted for the life of a product model.

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APPENDIX A: Sample Calculations

Viewable Diagonal Screen Size (inches)	Aspect Ratio	Viewable Screen Size, w x l (Inches)	Screen Area, A (sq-inches)	P _{ON,MAX} (watts)
20	16:9	17.4 x 9.8	170.9	21.9
32	16:9	27.9 x 15.7	437.6	43.7
42	16:9	36.6 x 20.6	753.8	65.9
50	16:9	43.6 x 24.5	1068.2	82.7
60	16:9	52.3 x 29.4	1538.3	98.7

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