ENERGY STAR® Program Requirements for Residential Light Fixtures

Eligibility Criteria – Version 4.0

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Below is the product specification (Version 4.0) for ENERGY STAR qualified residential light fixtures. A product must meet all of the identified criteria if it is to be labeled as ENERGY STAR by its manufacturer.

The intent of ENERGY STAR for Residential Light Fixtures is to move consumers from traditional incandescent fixtures to fixtures that use high-quality fluorescent or other energy-efficient technologies, including outdoor motion-sensors and daylight-sensors.

1) Definitions: Below is a brief definition of a light fixture and other related terms as relevant to ENERGY STAR:

   A. Light Fixture (Luminaire): A complete lighting unit consisting of a lamp or lamps and ballasting (when applicable) together with the parts designed to distribute the light, position and protect the lamps, and connect the lamps to the power supply.

   B. Lamp: A generic term for a manufactured source of light. By extension, the term is also used to denote sources that radiate in regions of the spectrum within the visible.

   C. Compact Fluorescent Lamp: Multitube or multibend single-ended pin-based lamps, including circline lamps.

   D. Linear Fluorescent Lamp: Straight or U-bent double-ended lamps.

   E. Ballast: A device used with an electric-discharge lamp to obtain the necessary circuit conditions (voltage, current and waveform) for starting and operating.

   F. Input Power: The actual total power used by all the lamps and ballast(s) of the light fixture when operating, measured in watts (W).

   G. Lamp Current Crest Factor: Ratio of peak current to the root mean square (RMS) lamp current.

   H. Ballast Frequency: The frequency at which the ballast operates the lamp, measured in Hertz (Hz) or kilohertz (kHz).

   I. Power Factor: The active power divided by the apparent power (i.e. product of the rms input voltage and rms input current of a ballast).

   J. Color Rendering: The effect that the spectral characteristics of the light emitted by the lamp has on the color appearance of the objects illuminated by the lamp. Color Rendering Index is measured on a scale of zero to 100, and is defined in terms of a comparison of the spectral tri-stimulus values of the objects under test illumination and a reference or standard illumination according to the recommendations of CIE Publication No. 13.3.

   K. Correlated Color Temperature (CCT): The actual color of the lamp is called the color temperature and is defined in terms of the spectral tri-stimulus values (color coordinates) according to the recommendations of IESNA LM-16. For color coordinates near the Black Body loci, the correlated color temperature, measured in Kelvin (K), is used.

   L. ANSI Standardized Color Oval: **TBD**

   M. Color Centroid: **TBD**

   N. NFPA: The National Fire Protection Association (United States) develops the National Electrical Code (NEC).

O. NVLAP: National Voluntary Laboratory Accreditation Program.

P. OSHA: Occupational Safety & Health Administration.

Q. NRTL: Nationally Recognized Testing Laboratory Program, which is a part of OSHA's Directorate of Technical Support.

R. ANSI: American National Standards Institute.

S. IESNA: Illuminating Engineering Society of North America.

T. CIE: Commission Internationale de l'Eclairage.

U. IEC: International Electrotechnical Commission.

V. UL: Underwriters Laboratories.

W. NEMA: National Electrical Manufacturers Association.

X. ALA: American Lighting Association.

Y. Recessed downlight retrofit kit: A non-linear lighting unit consisting of lamp(s), ballasting, optics, trim, and power supply connection designed to convert an incandescent or halogen type Insulated Ceiling (IC) or non-I.C. recessed downlight into an "air-tight" (AT) fixture that uses an energy-efficient source.

Z. Optics – Include reflectors, baffles, lenses and/or diffusers, all which control the light distribution and the appearance of the lighted fixture.

AA. Trim – Trim is the part of the downlight that covers the ragged edge of the ceiling cut-out. The trim may be a separate ring, or trim ring, or it may be integrated with the optics (i.e., a self-flanged reflector). Airtight or non-airtight.

BB. Pigtail – A short piece of cable with two connectors on each end for converting between one connector type and another; also referred to as a screw-based adapter and socket adapter.

2) Qualifying Products: The ENERGY STAR Residential Light Fixture specification covers the requirements for indoor and outdoor light fixtures and recessed downlight retrofit kits intended primarily for residential type applications. For the purposes of this ENERGY STAR specification, residential applications include single-family and multi-family dwellings (such as houses and apartments), dormitories, public or military housing, assisted-living facilities, motels and hotels, and some light commercial applications.

Note: Indoor fixtures that include magnetic ballasts cannot qualify for ENERGY STAR under this Version 4.0 specification. Only outdoor fixtures that use high intensity discharge (HID) lamps, such as metal halide and high pressure sodium, may continue to use magnetic ballasts.

Note: Magnetic ballasts are no longer allowed for use in qualifying indoor fixtures and are only allowed for use in outdoor fixtures that use high intensity discharge (HID) lamps, such as metal halide and high pressure sodium. In the Version 3.2 specification EPA notified partners that magnetic ballasts would eventually be phased out of the program due to the likelihood of longer start time, increased noise production, and lower potential efficacy. All references to and requirements for magnetic ballasts have been removed from those sections that apply to indoor fixtures. Partners will be given sufficient lead time to redesign indoor fixtures that use magnetic ballasts in order to meet new electronic ballast requirements (see Section 5).

Temporary allowance for decorative LEDs: EPA encourages the use of innovative light source technologies such as LEDs. LEDs used as decorative lighting elements in residential lighting fixtures and ceiling fan light kits are allowed as long as the total wattage of the LEDs does not exceed five (5) watts, the average LED system (LED and driver) efficacy is at least 20 lumens per watt, and the LED is used to supplement a primary light source that meets all of the applicable performance characteristics outlined in the Eligibility Criteria. The ENERGY STAR Partner must supply the following LED information to EPA: total wattage consumed by all the LEDs; an LED manufacturer specification sheet that shows wattage, efficacy, lamp life, color, and lumen depreciation; and a manufacturer warranty. This is a temporary allowance for the use of LEDs; EPA plans to develop more comprehensive specifications for LED performance as the technology advances and becomes more widely used in residential applications.

3) Energy-Efficiency Specifications for Qualifying Products: Only those products listed in Section 2 that meet the criteria below may qualify as ENERGY STAR. Specifications for qualifying **indoor fixtures** can be found in Table 1. Specifications for qualifying **recessed downlight retrofit kits** can be found in Table 1A. Specifications for qualifying **outdoor fixtures** can be found in either Table 2A – Outdoor Fixtures: Compliance Through Efficient Light Source, or Table 2A – Special Application: Outdoor Fixtures Installed on a Sensor-Controlled Circuit, or Table 2B – Outdoor Fixtures: Compliance Through Reduced Operating Time.

Note: The performance characteristics provided in the tables below have been reformatted so that manufacturers can better locate the specific requirements for each fixture component. In this Version 4.0 all specification requirements applying to the electronic ballast are found in one discrete place in the document. It is EPA's hope that the new format will assist those manufacturers looking to change only one component of their fixture, clearly defining what performance characteristics need to be retested.

Table 1 - Indoor Fixtures

Performance Characteristic	ENERGY STAR Specification
Combined Lamp & Ballast Requirements:	
System Efficacy (Lumens Per Watt (LPW))[1], per lamp ballast combination	≥ 50 LPW for all lamp types below 30 total listed lamp watts. ≥ 60 LPW for all lamp types that are ≤ 24 inches and ≥ 30 total listed lamp watts. ≥ 70 LPW for all lamp types that are > 24 inches and ≥ 30 total listed lamp watts.

Note: The efficacy requirements presented in the Version 3.2 specification lead to some confusion regarding lamps that measured exactly 24 inches in length. The 60 LPW and 70 LPW efficacy levels for lamps greater than or equal to 30 total listed watts both included 24-inch lamps in their requirements. To clarify, the 60 LPW requirement applies to lamps that are less than or equal to 24 inches while the 70 LPW applies only to those lamps greater than 24 inches in length. In addition, the lowest efficacy tier was raised from 46 LPW to 50 LPW. The 46 LPW limit had been allowed in previous versions of the specification to enable lower efficiency magnetic ballasts to be used. With the elimination of these ballasts in Version 4.0, the efficacy tier can now be raised to 50 LPW.

[1] Efficacy shall be determined by the following equation:

$$\text{Efficacy [Lumens per Watt]} = \frac{\text{Measured Lamp Lumens [Lumens]}}{\text{Measured Input Power [watts]}}$$

Lamp Lumens: Lamp lumens must be measured using the lamp and ballast that are shipped with the fixture.

Input Power: Input power must be measured with the lamp and ballast that are shipped with the fixture.

Lamp Start Time	The time needed after switching on the lamp to start continuously and remain illuminated must be an average of one second or less.

Note: The Version 3.2 specification included a requirement that manufacturers ship an "instant-on" lamp with qualified magnetic ballasted fixtures. This requirement has been removed from this table due to the phase-out of magnetic ballasted indoor fixtures from the list of fixture types eligible for ENERGY STAR qualification (see notation in Section 2, Qualifying Products).

Fluorescent Lamp Requirements:	
Lamp Life	For lamps indicated on the fixture packaging or shipped with the fixtures, the average rated life of the lamp must be $\geq$ 10,000 hours. If the lamp is not shipped with the fixture, special product packaging is also required. See the Product Packaging for Consumer Awareness section for more details.
Lumen Maintenance	For lamps indicated on the fixture packaging or shipped with the fixtures, the lamp shall have an average rated lumen maintenance of at least 80% of initial lamp lumens at 40% rated lamp life.

Note: When setting ENERGY STAR specifications EPA strives to promote high efficiency and high quality products. Lumen maintenance can affect consumer perception of quality and maintaining a high level of light throughout the lifetime of the lamp is critical for consumer acceptance of fluorescent technology. As such, EPA proposes to add the average rated lumen maintenance requirement above. This new section aligns with the lumen maintenance requirements already included in the ENERGY STAR specification for screw-base CFLs. Furthermore, this minimum requirement is in close proximity to lumen maintenance for incandescent lamps and is partially based on current acceptable industry levels. EPA encourages stakeholders to provide feedback on this new requirement and the levels proposed above.

Color Rendering Index	For lamps indicated on the fixture packaging or shipped with the fixtures, the color rendering index must meet the following requirements: > 80 for compact fluorescent lamps. > 75 for linear fluorescent lamps. If the lamp is not shipped with the fixture, special product packaging is also required. See the Product Packaging for Consumer Awareness section for more details.

Correlated Color Temperature	For lamps indicated on the fixture packaging or shipped with the fixtures, the measured color centroid of the lamp model must fall within the ANSI standardized color oval for one of the following targeted color temperatures: 2700K, 3000K, 3500K, 4100K, 5000K, or 6500K. It is also intended that the lamp manufacturer will meet the following quality requirements during production runs of each lamp model: 1. The manufacturer is required to maintain the ongoing (production) color centroid (central tendency) such that for each technical lamp model the measured centroid will fall within an ANSI standardized 4 step Mac Adam ellipse color oval for targeted colors (2700, 3000, 3500, 4100, 5000, 6500). 2. The manufacturer is required to maintain ongoing (production) color control for each individual lamp model such that a minimum of 90% of the lamps produced (typically over 12 months of production) fall within the 5 step Mac Adam ellipse specified by the manufacturer for that model. 3. The manufacturer agrees to spot-checks of color consistency (for 1 and 2 above), using a statistically significant sample size. If it is determined that a significant percentage of the manufacturer's products fall outside of both the ANSI and the 5 step Mac Adam ellipse specified by the manufacturer for that model, the manufacturer will agree to an external review of the company's color quality program (See 4). 4. For the purposes of maintaining color quality control, the manufacturer must maintain testing equipment calibrated to international standards and must compile the data so that it can be easily reviewed to determine compliance with ENERGY STAR program requirements, listed in 1 and 2, above. At a minimum, the quality control program must contain the following: • Test dates and sample sizes • Percent of total production monitored • Results • Statistical (numeric) and graphic summary of cumulative results for individual lamp models, compiled at least quarterly, for a statistically significant quantity of samples per quarter If an external review of a company's color quality control program is undertaken, those data will be used to determine final compliance with ENERGY STAR color requirements (contained in 1 and 2, above). If the lamp is not shipped with the fixture or the lamp is shipped with the fixture but does not have a targeted rated color temperature of 2700 or 3000K, special product packaging is also required. See the Product Packaging for Consumer Awareness section for more details.

	Note: The Correlated Color Temperature (CCT) metric (which is one of the performance characteristics that must be evaluated in Version 3.2) is inadequate in that it does not ensure color consistency for each lamp model, nor does it ensure consistency between different lamp models with the same rated color temperature. Where possible EPA adopts existing, industry accepted metrics and test procedures to ensure that ENERGY STAR qualified products can be compared in the marketplace and deliver consistent performance. In this specification EPA is proposing using ANSI standardized color ovals to ensure consistency among ENERGY STAR qualified fixtures in the marketplace. This standard has been selected based on industry and expert recommendations that ANSI standardized color ovals represent a more robust and effective specification than simple correlated color temperature. EPA encourages stakeholders to comment on the requirements proposed above and provide any additional suggestions to ensure color consistency among ENERGY STAR qualified products found in the marketplace. In particular, EPA would like Partners to comment on the target temperatures that they would like to see allowed in the specification (i.e., only 2700, 3000, 3500K, 4100K, 5000K, 6500K or would additional targets be preferred). EPA is also proposing to implement, and would encourage feedback regarding, the quality assurance procedure described above to ensure that the color centroid established during testing for ENERGY STAR is maintained during production runs of each lamp.
Lamp/Socket Compatibility	For lamps indicated on the fixture packaging or shipped with the fixtures, lamps must utilize an ANSI Standardized lamp base configuration, as defined by ANSI C81.61. If the ballast can operate lamps with multiple wattages (e.g., an 18W, 26W, or 32W lamp) then the ballast must be designed to accept lamps with ANSI Standardized lamp base configurations for all applicable wattages. In addition**,** lamps shall either: • meet ANSI C78.901-2001 (for compact fluorescent lamps) or C78.81-2001 (for linear lamps) if an applicable standard exists, or, • if no ANSI-IEC lamp standard exists (e.g., a spiral compact fluorescent lamp), a custom lamp specification sheet must be provided at the time of submittal. Specific lamp and lamp base characteristics that should be included in the lamp specification sheet are detailed in Table 3.
	Note: The requirements related to lamp/socket compatibility included in the "Durability" section of Table 1 in Version 3.2 have now been relocated into the new section above titled "Lamp/Socket Compatibility". When an applicable ANSI-IEC lamp standard data sheet is available for the lamp being used in the fixture, it now must be used in order to qualify for ENERGY STAR. Custom lamp types may only be used where no standard exists (i.e, for a spiral CFL lamp) and the manufacturer must include a lamp specification sheet for ENERGY STAR qualification. It is EPA's hope that implementing this new requirement will help ensure replacement lamps are available in the marketplace and that they properly fit and operate within the fixture should the original lamp fail.
Lamp Labeling Requirement	For lamps shipped with fixtures, lamp manufacturer and model number must be included on the lamp base.
	Note: While many lamps already contain labeling information, this requirement has been added to ensure that fixture components can be properly identified during third-party evaluation.
Electronic Fluorescent Ballast Requirements **(Note: Magnetic Ballasts May Not Be Used in Indoor Fixtures):**	
General	Per ANSI C82.11 Section 5 except paragraph 5.3.1.

Noise	Class A sound rating for electromagnetic and electronic ballasts, outside the fixture. Not to exceed a measured level of 24 dBA when measured in a room with ambient noise no greater than 20 dBA.
Power Factor	$\geq$ 0.5
Lamp Current Crest Factor	$\leq$ 1.7
Maximum Measured Ballast Case Temperature During Normal Operation Inside Fixture(s)	$\leq$ 75°C or not to exceed the ballast manufacturer recommended maximum ballast case temperature during normal operation inside a fixture, whichever is lower. **Note:** All qualified fixtures are expected to meet this requirement, including linear, suspended, close-to-ceiling, IC, ICAT and Non-IC recessed canisters, etc. as well as those fixtures that may be exempt from UL1598.

Note: The requirements related to ballast temperature included in the "Durability" section of Table 1 in Version 3.2 have now been relocated into the new section above titled "Maximum Measured Ballast Case Temperature During Normal Operation Inside Fixture(s)" for enhanced clarity. In addition, based on maximum measured ballast case temperature test data, the maximum measured ballast case temperature allowance has been lowered from 90°C to 75°C. EPA encourages manufacturers to comment on this new limit and propose alternative limits as well.

Electromagnetic and Radio Frequency Interference	Ballast must meet FCC requirements for consumer use (FCC 47 CFR Part 18 Consumer Emission Limits)
Ballast Frequency	20 to 33 kHz or $\geq$ 40 kHz
Transient Protection	Per ANSI C82.11b, paragraph 5.10.1 (100kHz Ring Wave, 2.5kV, both common mode and differential mode, 7 strikes)
End of Life Protection	All ballasts that operate lamps sized T5 and smaller must contain an end of life protection circuit. The manufacturer must submit a circuit diagram and an accompanying engineering description outlining the scheme that is used to achieve the end of life function within the ballast. In addition, ballasts that operate T4 and/or T5 sized lamps must contain an end of life protection circuit that has been tested in accordance with IEC 61347-2-3 Amendment 1 to Edition 1 2004-06.

Note: Testing is now required to demonstrate that end of life protection is present in ballasts that operate with T4 or T5 lamps. The placeholder included in Version 3.2 has been replaced by a requirement to test in accordance with the new IEC Standard. This standard, and the documentation required under this specification, more adequately addresses and ensures compliance with end of life protection. Because the standard only applies to T4 & T5 lamps, only these lamp sizes need to be tested for qualification under this specification. Similar to the requirements of Version 3.2, all ballasts using lamps sized T5 and smaller must continue to provide a circuit diagram and engineering description.

Dimming	Torchiere style portable fixtures shall be dimmable from 100% to 30%, or less, of maximum light output, or be switchable to three levels of brightness, not including the off position. Other fixture types that utilize dimmable ballasts shall be dimmable from 100% to 30%, or less, of maximum light output, or be switchable to three levels of brightness, not including the off position.

Safety - Ballasts and "Non Edison base Fluorescent Adapters"	The cover page of a safety test report or a general coverage statement must be provided to demonstrate compliance with ANSI/UL 935 or UL 1993, as appropriate.
Fixture Requirements	
Fixture Warranty	A written warranty must be included in fixture packaging at the time of shipment, which covers repair or replacement of defective parts of the fixture housing, optics, trim and electronics (excluding the lamp) for two years from the date of purchase.
Lamp Shipment Requirement	All indoor fixtures must be shipped with a lamp, except for the following fixture types: 1. Recessed downlight fixtures and recessed downlight retrofit kits 2. Fixtures using linear fluorescent lamps

Note: A new requirement that all ENERGY STAR qualified indoor fixtures be shipped with the qualifying lamp (with the exception of recessed downlights, recessed downlight retrofit kits, and fixtures using linear lamps) was added to help ensure that quality lamps will be used with the fixture. EPA believes that including this requirement will ensure overall fixture quality and performance while minimizing consumer confusion and complaints that would otherwise occur if the wrong lamp was selected. It is EPA's understanding that most ENERGY STAR partners are already shipping the lamp with the fixture for similar reasons.

Replaceable ballast	Ballasts in all fixtures (including portables) must be accessible and removable by an electrician without damage to the fixture housing, trim, decorative elements or the carpentry (e.g. ceiling drywall) to which the fixture is attached. Partner must provide instructions that explain how to access and replace the ballast in product literature for evaluation by EPA.
Note: A new requirement has been added that ballasts used in fixtures must be replaceable without destruction to the fixture or surrounding carpentry. This requirement was added at the request of a number of stakeholders and will increase the value of ENERGY STAR qualified fixtures and address frustrations expressed by the new construction and other markets. To ensure proper removal and avoid dissatisfaction with the product, EPA is also requiring that Partners provide clear instructions in the product literature.	
Product Packaging for Consumer Awareness Requirements	For fixtures that are not shipped with lamps (only recessed downlight fixtures, recessed downlight retrofit kits, and fixture using linear lamps may ship without a lamp), product packaging language must state: "To meet ENERGY STAR quality criteria, purchase a [List lamp manufacturer & model used for ENERGY STAR Testing, and if deemed necessary by the fixture manufacturer, other manufacturer & models that comply with ENERGY STAR] light bulb(s)]." For fixtures that are shipped with lamps that do not have a targeted *rated* color temperature of 2700K or 3000K, special product packaging language is required that clearly describes the color of the product (e.g. cool) and states its intended use. The language must be clearly visible to the consumer on the fixture packaging. Sample language: "The light source used in this fixture appears 'cooler' than standard incandescent lighting and is best suited for kitchens and utility rooms."
Note: EPA has clarified the packaging requirements to help ensure the consumer uses a lamp that will comply with ENERGY STAR. A new requirement that all indoor fixtures be shipped with a lamp (with the exception of recessed downlights, recessed downlight retrofit kits, and fixtures using linear lamps) was also added to help ensure that quality lamps will be used with the fixture. EPA believes that including this requirement will ensure overall fixture quality and performance while minimizing consumer confusion and complaints that would otherwise occur if the wrong lamp was selected. It is EPA's understanding that most ENERGY STAR partners are already shipping the lamp with the fixture for similar reasons.	
Safety - Portable Fixtures	The cover page of a safety test report or a general coverage statement must be provided to demonstrate compliance with ANSI/UL 153.
Safety - Hardwired Fixtures	The cover page of a safety test report or a general coverage statement must be provided to demonstrate compliance with UL 1598.
Recessed Downlight Fixtures-Insulation Contact (IC)-Rated	Recessed downlight fixtures that are either IC-Rated for direct contact with insulation or non IC-Rated may qualify as ENERGY STAR. For fixtures to be considered IC-Rated they must be approved for zero clearance insulation cover (IC) by an OSHA NRTL. For recessed downlight fixtures that are IC-Rated, special product packaging language is required to ensure that these products can be easily identified. The language must be clearly visible on the product

	packaging. Sample language: "IC-Rated for direct contact with insulation." The IC-Rated designation will also be included in the fixture description posted on the ENERGY STAR Web site.
Note: EPA has added a performance characteristic and packaging requirement for fixtures that are rated for direct contact with insulation (IC-Rated) to ensure that these ENERGY STAR qualified products meet various state energy codes and are clearly marked to make selection easier for consumers. Recessed downlight fixtures that are non-IC Rated are still eligible to earn the ENERGY STAR.	
Recessed Downlight Fixtures-Air Tight (AT) For Restricted Air Movement	Recessed downlight fixtures that are either Air Tight (AT) or not AT may qualify as ENERGY STAR. For fixtures to be considered AT they must have leakage less than 2.0 cubic feet per minute (CFM) at 75 Pascals (or 1.57 lbs/ft^2) when tested in accordance with ASTM E283 and shall be sealed with a gasket or caulk between the housing and ceiling. For recessed downlight fixtures that are AT, special product packaging is required to ensure that these products can be easily identified. The language must be clearly visible on the product packaging. Sample language: "Certified Air Tight per ASTM E283". The AT designation will also be included in the fixture description posted on the ENERGY STAR Web site.
Note: EPA has added a performance characteristic and packaging requirement for fixtures that are Air Tight (AT) to ensure that these ENERGY STAR qualified products meet various state energy codes and are clearly marked to make selection easier for consumers. Recessed downlight fixtures that are not AT are still eligible to earn the ENERGY STAR.	

Recessed Downlight Retrofit Kits: The following ENERGY STAR performance requirements must be met by recessed downlight retrofit kits **in addition** to those listed in Table 1 – Indoor Fixtures, above.

Table 1A – Additional Requirements for Indoor Recessed Downlight Retrofit Kits

Performance Characteristic	ENERGY STAR Specification
Reflectors	Reflectors must be included to maximize fixture efficiency.
Aperture	Maximum 7.0"
Air Tight (AT) For Restricted Air Movement	Recessed downlight retrofit kits that are either Air Tight (AT) or not AT may qualify as ENERGY STAR. For fixtures to be considered AT they must have leakage less than 2.0 cubic feet per minute (CFM) at 75 Pascals (or 1.57 lbs/ft^2) when tested in accordance with ASTM E283 and shall be sealed with a gasket or caulk between the housing and ceiling. For recessed downlight fixtures that are AT, special product packaging is required to ensure that these products can be easily identified. The language must be clearly visible on the product packaging. Sample language: "Certified Air Tight per ASTM E283". The AT designation will also be included in the fixture description posted on the ENERGY STAR Web site.

Note: EPA has removed the option for meeting the Restricted Air movement requirement by manufacturing fixtures "without penetrations between the recessed fixture and ceiling cavity and sealed or gasketed to prevent air leakage into the conditioned space". The only option for meeting this requirement is to test performance in accordance with ASTM E283. In addition, the specification now explicitly defines the level of leakage that must be achieved for the fixture to be labeled as air - tight.	
Electrical Connections	Edison socket with wire "pigtail" to the ballast.
Safety - Fixture Conversions, Retrofits	Fixtures must be tested and listed by an OSHA NRTL as acceptable for compliance with NFPA 70, National Electrical Code (NEC). The cover page of a safety test report or a general coverage statement must be provided to demonstrate compliance with UL 1598 and UL 1598B.
Packaging Requirements	Recessed downlight retrofit kit packaging must clearly indicate what model numbers the recessed downlight retrofit kits are compatible with. Recessed downlight retrofit kit packaging must clearly indicate that the downlight retrofit kit complies with ASTM E283. Recessed downlight retrofit kit packaging must include instructions on how to properly install the product. Recessed downlight retrofit kit packaging and instructions must clearly indicate whether or not the product is dimmable. If dimmable, user instructions must clearly indicate what type of dimming circuit it can be used on. Recessed downlight retrofit kit packaging and instructions must clearly state any known incompatibility with photo controls, dimmers or timing devices.

Table 2A – Outdoor Fixtures: Compliance Through Efficient Light Source

Note: Only electronic ballasts may be used to meet the requirements of this table unless high intensity discharge lamps, such as metal halide or high pressure sodium lamps, are used in which case magnetic ballasts can still be used. In addition, fixtures that utilize self-ballasted compact fluorescent lamps, regardless of base type (mogul, medium, etc), are not eligible to earn the ENERGY STAR under the requirements set forth in this table. For example, a screw-based compact fluorescent lamp may not be used, though a metal halide lamp may be used.	
Performance Characteristic	**ENERGY STAR Specification**
Maximum Input Power	150 watts
System Efficacy	$\geq$ 40 LPW for all lamp types below 15 total listed lamp watts. $\geq$ 50 LPW for all lamp types over 15 total listed lamp watts up to 30 total listed lamp watts $\geq$ 60 LPW for all lamp types over 30 total listed lamp watts

Note: The required efficacy for outdoor fixtures using an efficient light source to qualify as ENERGY STAR has been increased. EPA strives to set energy efficiency levels that will maximize savings without being overly burdensome to Partners and can be achieved by many different technologies. A review of qualified outdoor products suggests that the efficacy levels proposed above are already being met in a majority of cases. The revised efficacy levels remain less stringent than the requirements for indoor fixtures so that a variety of efficient lighting technologies (i.e., metal halide and high pressure sodium lamps) may continue to be used in qualifying outdoor fixtures providing flexibility in product design and more choices to the consumer.	
Lamp Life	For lamps indicated on the fixture packaging or shipped with the fixtures, the average rated life of the lamp must be $\geq$ 10,000 hours. For fixtures that are not shipped with lamps, product packaging language must state: "To meet ENERGY STAR quality criteria, purchase a [List lamp manufacturer & model used for ENERGY STAR Testing, and if deemed necessary by the fixture manufacturer, other manufacturer & models that comply with ENERGY STAR] light bulb(s)."
Note: EPA has clarified the packaging requirements to help ensure the consumer uses a lamp that will comply with ENERGY STAR (i.e., in this case, have a rated life of at least 10,000 hours). Unlike the change to the requirements for indoor fixtures, all types of outdoor fixtures may continue to ship with or without a lamp at the discretion of the manufacturer.	
Lamp/Socket Compatibility	For lamps indicated on the fixture packaging or shipped with the fixtures, lamps must utilize an ANSI Standardized lamp base configuration, as defined by ANSI C81.61. If the ballast can operate lamps with multiple wattages (e.g., an 18W, 26W, or 32W lamp) then the ballast must be designed to accept lamps with ANSI Standardized lamp base configurations for all applicable wattages. In addition, lamps shall either: • meet ANSI C78.901-2001 (for compact fluorescent lamps) or C78.81-2001 (for linear lamps) if an applicable standard exists, or, • if no ANSI-IEC lamp standard exists (e.g., a spiral compact fluorescent lamp), a custom lamp specification sheet must be provided at the time of submittal. Specific lamp and lamp base characteristics that should be included in the lamp specification sheet are detailed in Table 3.
Note: The lamp/socket compatibility requirement included in Table 2A of Version 3.2 has been removed. This requirement prevented the operation of those lamps that exceeded the input power range of the fixture or was of a different lamp type not intended for use in the fixture. EPA feels that existing UL safety requirements already adequately address these concerns. The new language proposed above aligns with the revised lamp/socket compatibility requirements for indoor fixtures. When an applicable ANSI-IEC standard is available for the lamp being used in the fixture, the manufacturer must meet its requirements for ENERGY STAR qualification. Custom lamp types may only be used where no standard exists (i.e, for a spiral CFL lamp) and the manufacturer must include a lamp specification sheet for ENERGY STAR qualification. It is EPA's hope that implementing this new requirement will help ensure replacement lamps are available in the marketplace and that they properly fit and operate within the fixture should the original lamp fail.	

Electromagnetic and Radio Frequency Interference	Ballast must be FCC rated for consumer use (FCC 47 CFR Part 18 Consumer Emission Limits).
Controls - Time of Day Sensor	The fixture must contain an integrated time of day sensor that automatically prevents operation during daylight hours. In addition, the sensor must automatically reset to sensing mode within 24 hours of a manual override or testing operation. If the daylight threshold sensor can be adjusted such that the fixture can operate during full daylight, or automatic reset to sensing mode will not occur within 24 hours of a manual override or testing operation, special language is required that provides a range of settings that will result in the fixture complying with the specification. The language must be clearly visible to the consumer on the fixture packaging **and** in the fixture manual. Sample language: "To meet ENERGY STAR requirements the photosensor control knob must be set to x, y, or z to prevent operation during full daylight".
	Note: EPA has clarified the terminology associated with a time of day sensor, intended to be a device (e.g., a photocell or time clock) that automatically prevents operation of the fixture during daylight hours. EPA is also requiring additional language on product packaging and in the product manual regarding time of day sensors that can be adjusted to allow operation during full daylight or will not reset within 24 hours of a manual override or testing procedure. In both of these cases, the manufacturer must indicate which settings will allow the fixture to operate in compliance with the requirements.
Fixture Warranty	A written warranty must be included in fixture packaging at shipment, which covers repair or replacement of defective parts of the fixture housing or electronics (excluding the lamp) for two years from the date of purchase.
Replaceable ballast	Ballasts must be accessible to and removable by an electrician without damage to the fixture housing, trim, decorative elements or the carpentry (e.g. ceiling drywall) to which the fixture is attached. Partner must provide instructions that explain how to access and replace the ballast in product literature for evaluation by EPA.
	Note: A new requirement has been added that ballasts used in fixtures must be replaceable without destruction to the fixture or surrounding carpentry. This requirement was added at the request of a number of stakeholders and will increase the value of ENERGY STAR qualified fixtures and address frustrations expressed by the new construction and other markets. To ensure proper removal and avoid dissatisfaction with the product, EPA is also requiring that Partners provide clear instructions in the product literature.
Safety	Fixtures must be compliant with NFPA 70, the National Electrical Code (NEC), including requirements for wet or damp locations (Articles 410-4a and Article 100).
	Note: EPA has clarified the safety requirement above to explicitly allow outdoor fixtures that meet either wet-listing or damp-listing requirements to qualify as ENERGY STAR. This was EPA's original intent when developing the Version 3.2 specification although not specifically called out in the text.

Table 2A Special Application - Outdoor Fixtures Installed on a Sensor-Controlled Circuit

Controls – Sensor Controlled Circuit Installed in Place of Integrated Time of Day Sensor	For compliance with this table, fixtures may use a sensor-controlled circuit in place of an integrated time of day sensor to automatically prevent operation during daylight hours. This special application is intended for fixtures used in multi-tenant housing such as apartments where fixtures with integrated time of day sensors may "see" each other and thereby cause lamp cycling. For fixtures that are sold without an integrated time of day sensor, the package must include the following language next to the ENERGY STAR label and on the front panel of the packaging, in 12pt or larger font: "This product is ENERGY STAR qualified only when installed on a photocell controlled circuit, sold separately, and is intended for use in multi-tenant housing where multiple fixtures are commonly controlled with a single sensor. The following circuit is recommended for use with this fixture: [List Manufacturer and Model Number of Recommended Control Circuit]. For information about where to purchase this recommended circuit, contact: [List Partner Phone Number or Web Address Where Information Can Be Found]". In addition, this note will be included in the product's fixture description on the ENERGY STAR Qualified Product List.

Note: EPA has renamed this section and further clarified the intent and requirements for outdoor fixtures that work on a sensor-controlled circuit. This table continues to allow for the qualification of an outdoor fixture without an integrated time of day sensor for products that will be installed in multi-tenant housing, where it is more common to control multiple fixtures with a single sensor controlled circuit. However, EPA is now requiring additional text to be provided on product packaging that more clearly states the intended use of this fixture type with the hope that this will discourage a consumer selecting a single outdoor fixture for their home from purchasing it.

Table 2B - Outdoor Fixtures: Compliance Through Reduced Operating Time

Performance Characteristic	**ENERGY STAR Specification**
Note: All lamp types (fluorescent, incandescent, etc.) may be used to meet the requirements set forth in this table. **Note:** To address manufacturer confusion regarding which lamp types can be used to qualify an outdoor fixture under the requirements of Table 2B, a notation has been added to the top of the table stating that all lamp types are eligible.	
Maximum Input Power	250 watts

Controls - Time of Day Sensor	The fixture must contain an integrated daylight threshold sensor that automatically prevents operation during daylight hours. In addition, the sensor must automatically reset to sensing mode within 24 hours of a manual override or testing operation. If the daylight threshold sensor can be adjusted such that the fixture can operate during full daylight, or automatic reset to sensing mode will not occur within 24 hours of a manual override or testing operation, special product packaging language is required that provides a range of settings that will result in the fixture complying with the specification. The language must be clearly visible to the consumer on the fixture packaging **and** in the fixture manual. Sample language: "To meet ENERGY STAR requirements the photosensor control knob must be set to x, y, or z to prevent operation during full daylight".

Note: EPA has clarified the terminology associated with a time of day sensor, which is intended to be a device (e.g., a photocell or time clock) that automatically prevents operation of the fixture during daylight hours. EPA has also provided additional clarification regarding time of day sensors that can be adjusted to allow operation during full daylight or will not reset within 24 hours of a manual override or testing procedure. In both of these cases, the manufacturer must indicate on product packaging which settings will allow the fixture to operate satisfying ENERGY STAR requirements. Sample language is provided for reference.

Controls – Motion Sensor	The fixture must contain an integrated motion sensor that employs infrared sensing technology. The sensor must: • allow automatic shut-off of the lamp within 15 minutes of being manually activated by a switch or automatically activated by the sensor, and • automatically reset to sensing mode within 24 hours of a manual override or testing operation. The fixture must: • include instructions within the packaging that outline step-by-step calibration instructions for the motion sensor, and • have an indicator that visibly or audibly informs the devise operator that the motion sensor is operating properly, or that is has failed or malfunctioned. If the integrated motion sensor can be adjusted such that shut-off will not occur within 15 minutes or automatic reset to sensing mode will not occur within 24 hours of a manual override or testing operation, special product packaging language is required that provides a range of settings that will resulting the fixture complying with the specification. The language must be clearly visible to the consumer on the fixture packaging **and** in the fixture manual. Sample language: "To meet ENERGY STAR requirements, the motion sensor control knob must be set to x, y, or z to allow automatic reset of the sensor".

Note: Similar to the clarification provided for time of day sensors above, EPA has provided further clarification in this section regarding motion sensors that can be adjusted to allow operation of the fixture for more than 15 minutes after sensing or will not reset within 24 hours of a manual override or testing procedure. In both of these cases, the manufacturer must indicate on product packaging which settings will allow the fixture to operate satisfying ENERGY STAR requirements. Again, sample language is provided for reference. In addition, the specification now states that infrared sensing technology is acceptable for meeting the motion sensor requirements and other technologies may be utilized with EPA's approval.

Fixture Warranty	A written warranty must be included in fixture packaging at shipment, which covers repair or replacement of defective parts of the fixture housing or electronics (excluding the lamp) for two years from the date of purchase.
Replaceable ballast	If a ballast is present in the fixture, it must be accessible to and removable by an electrician without damage to the fixture housing, trim, decorative elements or the carpentry (e.g. ceiling drywall) to which the fixture is attached. Partner must provide instructions that explain how to access and replace the ballast in product literature for evaluation by EPA.
Safety	Fixtures must be compliant with NFPA 70, the National Electrical Code (NEC), including requirements for wet or damp locations (Articles 410-4a and Article 100).

Note: EPA has clarified the safety requirement above to explicitly allow outdoor fixtures that meet either wet-listing or damp-listing requirements to qualify as ENERGY STAR. This was EPA's original intent when developing the Version 3.2 specification although not specifically called out in the text.

4) Qualification Process, Acceptable Testing Facilities, Testing Standards & Required Documentation:
The following section describes the steps required to qualify residential light fixtures as ENERGY STAR, provides information about acceptable testing facilities, and states the testing standards and documentation required for each performance characteristic.

Steps for Partners to Qualify Residential Light Fixtures for ENERGY STAR
To qualify a residential lighting fixture as ENERGY STAR, it must be tested according to the protocol outlined below. **Note: EPA reserves the right to require additional documentation, at any time, in order to determine compliance with all performance characteristics.**

A. Partner must test qualifying products and obtain required documentation to meet the performance characteristics listed in Section 3 of this specification. Refer to Table 3, below, to determine the reference standard and required documentation applicable to each performance characteristic.

The following stipulations apply:

- For performance characteristics that require testing, the minimum required sample size is three units for each lamp/ballast combination, unless otherwise noted.
- For multiple fixture models that use the same lamp/ballast combination, only one set of test results is required. For example, two fixtures that use the same lamp and ballast combination, but have different trim, lens and/or chasse need only be tested once.
- For fixture models that may use different ballasts (either in terms of the type of ballast or manufacturer), each lamp/ballast combination must undergo testing and the test results must be submitted for qualification. For example, if a residential light fixture partner plans to use ballasts from several manufacturers in any one fixture, the fixture must be tested with each manufacturer's ballast.
- For fixture models with one ballast type that can work with multiple lamp types, the fixtures need only be tested with one lamp type. The lamp type must either be the one supplied with the fixture at shipment or, if a lamp is not supplied, one of the lamp types listed on the packaging. Please note that EPA expects all lamps listed on the packaging to comply with the specification when operating on the fixture's ballast. To ease the burden on the

manufacturer, however, test data need be submitted for only one lamp type operating on the fixture's ballast.

B. Submit a signed and completed copy of the ENERGY STAR Residential Light Fixture Qualified Product Information (QPI) form along with required documentation. To obtain the current version of the form, visit the "Lighting" section of the ENERGY STAR Web site at www.energystar.gov/partners and click on "Product Specifications."

Explanation of Acceptable Testing Facilities:

- To ensure quality product in the marketplace, ENERGY STAR requires test data from a laboratory accredited by one of the following: NVLAP or, when appropriate, from an OSHA NRTL or a laboratory accredited by an OSHA NRTL, or the manufacturer's laboratory (for Maximum Measured Ballast Case Temperature During Normal Operation). See Table 3 for specific requirements.

  Please note that the required laboratory data for lumen output, CRI, CCT, and lamp life must come from a NVLAP accredited laboratory whose scope of accreditation includes the specific reference standards that are listed in Table 3 of this specification. Partners should obtain from the laboratory both its certificate of accreditation and its scope of accreditation and submit them to ENERGY STAR. Documentation for safety requirements must come from an OSHA NRTL. All other documentation may come from one of the accredited laboratories mentioned in the previous paragraph.

- Use the information below to locate an acceptable testing facility:

  - For a list of NVLAP accredited laboratories, visit the NVLAP Web site at http://www.nist.gov/nvlap or call (301) 975-4016.
  - For a list of accredited OSHA NRTL's, visit http://www.oshaslc.gov/dts/otpca/nrtl/index.html or call (202) 693-2110.

Note: EPA has removed the allowance of third-party test results from laboratories accredited by NVLAP's MRA signatory partners (ILAC, APLAC, and NACLA) as a result of data quality concerns and lack of participation from such signatories.

C. ENERGY STAR Partners may obtain test data through any of the following sources:

- **A public or private laboratory accredited by NVLAP or a public or private laboratory accredited by an OSHA NRTL.** Partner should supply laboratory test reports with a completed QPI form.
- **The original equipment manufacturer.** Partners should supply laboratory test reports or an ENERGY STAR Platform Letter of Qualification with a completed QPI form. The ENERGY STAR Platform Letters of Qualification are given to manufacturers who pre-qualified certain performance requirements for their lamp and/or ballast.
- **An industry association.** Partners should supply laboratory test reports or a letter issued by ENERGY STAR to said industry association that acknowledges the association's data sources. ENERGY STAR issues such letters to industry associations, who take responsibility for certain performance requirements of lamp/ballast combinations.

Note: Fixture manufacturers may use the NEMA-ALA Lamp and Ballast Matrices as a source for obtaining required information to qualify fixtures. These matrices can be found at http://www.nema.org/lampballastmatrix/.

Table 3 – Reference Standards and Required Documentation

Performance Characteristic (refer to Tables 1, 1A, 2A or 2B as appropriate)	**Methods of Measurement Reference Standards**	**Required Documentation** (to be attached to QPI Form)
Note: Table 3 has been generally revised to clarify when documentation is required and what forms of documentation are acceptable for each performance characteristic. All specific changes to documentation requirements are noted individually below.		
System Efficacy: Light Output Input Power (Tables 1, 2A)	IESNA LM-9; LM-66; ANSI C82.2	Laboratory test results must come from the specific lamp and ballast combination that will operate in the fixture. Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic. **Note:** The laboratory used for this test must be accredited by NVLAP *and* have a scope of accreditation that includes the method of measurement reference standard for this performance characteristic.
Reflectors (Table 1A)	No Standard Available (Use manufacturer protocol)	No supplemental documentation required.
Lamp Start Time (Table 1)	ANSI C82.11-5.2	Laboratory test results must come from the specific lamp and ballast combination that will operate in the fixture. Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic; or 3. a test report from a laboratory accredited by an OSHA NRTL.

Lamp Life (Tables 1, 2A)	IESNA LM-40; LM-65	Laboratory test results must come from the specific lamp and ballast combination that will operate in the fixture. Provide a test report from a laboratory accredited by NVLAP that demonstrates the lamp has an average rated lamp life of at least 10,000 hours. For this test, a sample of ten or more lamps must be used. Manufactures may obtain ENERGY STAR conditional qualification for their fixture if all of the following items are provided: 1) A letter on NVLAP laboratory letterhead demonstrating lamp life testing has begun. 2) A laboratory report proving lamps have at least passed 1,000 hours of life testing. 3) The date for testing completion. Conditional approval will only be granted for a period of no longer than 450 days. **Note:** The laboratory used for this test must be accredited by NVLAP *and* have a scope of accreditation that includes the method of measurement reference standard for this performance characteristic.
Note: Full lamp life testing is now required for all fixtures under this Version 4.0 specification. EPA's intent is to further ensure that high-quality long-lasting lamps are provided with each ENERGY STAR qualified fixture. It is EPA's understanding that full lamp life testing is the only acceptable means for determining compliance with the rated lamp life requirement. However, EPA realizes that the time required to complete a full lamp life test for a 10,000-hour lamp is long, thus delaying the overall qualification process. Therefore a conditional qualification will be allowed once the manufacturer has provided proof that at least 1000 hours of testing has been completed along with an expected test completion date.		
Lumen Maintenance (Table 1)	IESNA LM65, IESNA LM66 & ANSI C78.5	Documentation must show the average maintained lumens at 40 percent life (4,000 hours) for a sample size of at least ten lamps. Provide a test report from a laboratory accredited by NVLAP.
Note: This new documentation requirement was added so that manufacturers can prove compliance with the new lumen maintenance requirements proposed by EPA in Table 1, above. EPA encourages stakeholders to provide feedback on this new requirement and the levels proposed above.		

Color Rendering Index (Table 1)	IESNA LM-58; CIE 13.3	Laboratory tests must be completed on a lamp intended for use in the fixture for a sample size of at least ten lamps. Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. supply an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic. **Note:** The laboratory used for this test must be accredited by NVLAP *and* have a scope of accreditation that includes the method of measurement reference standard for this performance characteristic.
Correlated Color Temperature (Table 1)	IESNA LM-58; LM-16	Laboratory tests must be completed on the lamp shipped with the fixture or listed on product packaging for a sample size of at least ten lamps. Provide: 1. a test report from a laboratory accredited by NVLAP showing that the centroid of the manufacturer's 4-step Mac Adam ellipse for the given lamp falls within the respective ANSI Mac Adam color tolerance oval (Mac Adam ellipse), and that 90% of the lamps tested fall within the ANSI Mac Adam ellipse; or 2. supply an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic. **Note:** The laboratory used for this test must be accredited by NVLAP *and* have a scope of accreditation that includes the method of measurement reference standard for this performance characteristic.

Note: The documentation requirement above has been modified to support the revisions made to the correlated color temperature requirements in Table 1, above. Manufacturers must now provide either a test report showing compliance with the ANSI Mac Adam color tolerance oval or an EPA Platform Letter of Qualification listing the lamp/ballast combination that will be used in the fixture.

Noise (Table 1)	Class A sound rating for electromagnetic and electronic ballasts, measured outside the fixture. Not to exceed a measured level of 24 dBA (audible) when measured with a sound meter (similar in performance to B&K type 2209) where the microphone is located 12 inches from the fixture in any direction in a room with ambient noise no greater than 20 dBA.	No supplemental documentation required. **Note:** A laboratory test report must be submitted upon EPA request.
Note: Under Version 3.2 manufacturers had to provide EPA with data that showed compliance with the sound rating requirement above. Due to the fact that magnetic ballasts are no longer allowed for use in qualifying indoor fixtures, the potential for fixtures to have a noise level above Class A rating is greatly reduced. While fixtures are still required to maintain a Class A rating, no supplemental documentation will be required at the time of qualification. However, a laboratory test report must still be submitted upon EPA request.		
Fixture Warranty (Tables 1, 2A, 2B)	No Standard Available (Use manufacturer protocol)	Provide a copy of the actual two-year fixture manufacturer written warranty that is included in product packaging.
Dimming (Table 1)	No Standard Available (Use manufacturer protocol)	No supplemental documentation required. **Note:** A laboratory test report proving the fixture is dimmable from 100% to 30% must be submitted upon EPA request.
<u>Lamp/Socket Compatibility</u>: (Tables 1, 2A)		
Lamp Base Configuration	ANSI C81.61	No supplemental documentation required.
Lamps Compliant with an ANSI-IEC Standard	ANSI C78.901-2001; ANSI C78.81-2001;	No supplemental documentation required.

Lamps Not Compliant with an ANSI-IEC Standard	ANSI C78.901-2001; ANSI C78.81-2001 (used as a reference for the format and type of information required on a custom lamp specification sheet)	Provide a manufacturer lamp specification sheet that describes the following (use the ANSI lamp data sheets found in ANSI C78.901 and C78.81 as a reference for the format and type of information requested): 1. Lamp Description, including: • Lamp Model Number • Nominal Wattage • Bulb Designation / Lamp Size (i.e., T4, T5, T8, etc.) • ANSI Base Type as defined by ANSI C81.61 (i.e., 2G13, GR10q, etc.) • Starting Circuit Application (i.e., rapid start, preheat, etc.) 2. Dimensional Characteristics, including diagram 3. Lamp Operating Characteristics, including: • Approximate wattage (W) • Voltage(V) • Current (A)
Replaceable Ballast (Tables 1, 2A, 2B)	No Standard Available (Use manufacturer protocol)	Provide a copy of instructions that explain how to access and replace the ballast.
Note: This new documentation requirement was added so that EPA can review the instructions provided by manufacturers regarding ballast replacement. In addition to compliance, EPA is requiring this additional documentation to also ensure that the consumer is receiving clear and concise direction so as to avoid frustrations and product return.		
<u>Safety: Indoor</u> • Portable Fixtures (Table 1)	ANSI/UL 153	Provide the cover page of a safety test report or a general coverage statement from an OSHA NRTL.
• Hardwired Fixtures (Table 1)	UL 1598	Provide the cover page of a safety test report or a general coverage statement from an OSHA NRTL.
• Ballasts and "Non-Edison based Fluorescent Adapters" (Table 1)	ANSI/UL 935 or UL 1993	Provide the cover page of a safety test report or a general coverage statement from an OSHA NRTL.
• Fixture Conversions, Retrofits (Table 1A)	UL 1598 and UL 1598B	Provide the cover page of a safety test report or a general coverage statement from an OSHA NRTL.

Safety: Outdoor (Tables 2A & 2B)	NFPA 70, the National Electrical Code (NEC), including requirements for wet locations when applicable (Articles 410-4a and Article 100)	Provide the cover page of a safety test report or a general coverage statement from an OSHA NRTL. Including evidence of the Rain Test for Wet Location when applicable.
Power Factor (Table 1)	ANSI C82.11-3.3.1	Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic; or 3. a test report from the manufacturer Note: A laboratory test report must be submitted upon EPA request.
Lamp Current Crest Factor (Table 1)	ANSI C82.11-3.3.3 and 5.6 ANSI C82.1-5.6.1	Laboratory testing must be completed using the ballast that is shipped with the fixture. Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. an EPA approved Platform Letter of Qualification that lists the lamp/ballast combination used in the fixture and the test result for this performance characteristic; or 3. a test report from a laboratory accredited by an OSHA NRTL.

Measured Maximum Ballast Case Temperature During Normal Operation Inside Fixture(s) (Table 1)	UL 1598, Section 11 (Acceptable when the thermocouple is placed at the hot-spot location indicated by the ballast manufacturer.) -OR- Lighting Research Center (LRC) "Proposed Durability Testing Method: Temperature" available at http://www.energystar.gov **Note:** All qualified fixtures are expected to meet the Maximum Measured Ballast Case Temperature During Normal Operation Inside Fixture(s) requirement. This includes every qualified fixture including linear, suspended, close-to-ceiling, IC, ICAT and Non-IC recessed canisters, etc. as well as those fixtures that may be exempt from UL1598.	The supplemental documentation should include the following: • Fixture model(s) tested • Lamp model(s) and ballast model(s) tested • Measured maximum ballast case temperatures • Ambient temperature • Test procedure, including description of fixture installation, thermocouple location(s), and time that elapsed before readings were taken. Provide a test report from: 1. a laboratory accredited by an OSHA NRTL, 2. a laboratory accredited by NVLAP; or 3. the manufacturer
Note: Further clarification regarding the specific information and supplemental documentation needed to show compliance with this performance characteristic have been defined to ensure that the maximum measured temperature is determined using an acceptable process. Stakeholders will be able to find LRC's proposed test procedure on the ENERGY STAR Web site in the case where UL 1598 is not used.		
Electromagnetic and Radio Frequency Interference (Tables 1, 2A)	Consumer Limits Per FCC 47 CFR Part 18.305 and 18.307	No supplemental documentation required. Note: A laboratory test report must be submitted upon EPA request.
Ballast Frequency (Table 1)	Oscilloscope instruction manual	Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. a test report from the manufacturer Note: A laboratory test report must be submitted upon EPA request.

Transient Protection (Table 1)	ANSI C82.11b, paragraph 5.10.1	Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. a test report from the manufacturer Note: A laboratory test report must be submitted upon EPA request.
End of Life Protection (Table 1)	IEC 61347-2-3 Amendment 1 to Edition 1 2004-06	For all ballasts that operate lamps sized T5 and smaller, the manufacturer must provide a circuit diagram and an accompanying engineering description outlining the scheme that is used to achieve the end of life function within the ballast. In addition, for ballasts that operate T4 and/or T5 sized lamps, provide manufacturer or lab data that demonstrate the ballast is in compliance with ANSI/IEC xxx.
Note: The previous documentation requirement in Version 3.2 of the specification has been supplemented with a test requirement for T4 and T5 lamps. In addition to providing a circuit diagram and engineering description for all ballasts that are required to have end of life protection, test results demonstrating compliance with C82.11-2005 are also now required.		
Aperture (Table 1A)	No Standard Available (Use manufacturer protocol)	No supplemental documentation required.
Restricted Air Movement (Table 1A)	ASTM E283	Provide: 1. a test report from a laboratory accredited by NVLAP; or 2. a test report from the manufacturer Note: A laboratory test report must be submitted upon EPA request.
Electrical Connections (Table 1A)	No Standard Available (Use manufacturer protocol)	Supply engineering description and/or schematic.
Indoor Product Packaging Requirements: (Table 1) • Lamp Life • Correlated Color Temperature • Color Rendering Index For Fixtures without Lamps	No Standard Available (Use manufacturer protocol)	Provide a written copy or a PDF graphic of the language that will be displayed on product packaging.

Indoor Product Packaging Requirements: (Table 1A) • Recessed Downlight Retrofit Kit	No Standard Available (Use manufacturer protocol)	Provide a written copy or a PDF graphic of the language that will be displayed on product packaging and provide the appropriate installation instructions
Outdoor Product Packaging Requirements: (Tables 2A, 2B) • Lamp Life • Time of Day Sensor Settings	No Standard Available (Use manufacturer protocol)	Provide a written copy or a PDF graphic of the language that will be displayed on product packaging.
Outdoor Product Packaging Requirements: (Table 2B) • Motion Sensor Settings	No Standard Available (Use manufacturer protocol)	Provide a written copy or a PDF graphic of the language that will be displayed on product packaging.
Outdoor Product Packaging Requirements: (Table 2A Special Applications)	No Standard Available (Use manufacturer protocol)	Provide a written copy or a PDF graphic of the language that will be displayed on product packaging.
Controls - Time of Day Sensor (Tables 2A, 2B)	No Standard Available (Use manufacturer protocol)	Provide applicable sections of fixture manual(s) that demonstrate controls exist for each fixture being submitted. Note: A laboratory test report must be submitted upon EPA request.
Note: Under Version 3.2 Partners were only required to provide manufacturer or lab data regarding this requirement. EPA is now requiring that the Partner provide the applicable portions of the fixture manual(s) that demonstrate that controls are present. By providing fixture-specific documentation, EPA can be assured that all control requirements are being met.		
Controls - Motion Sensor (Table 2B)	No Standard Available (Use manufacturer protocol)	Provide applicable sections of fixture manual(s) that demonstrate controls exist for each fixture being submitted. Note: A laboratory test report must be submitted upon EPA request.
Note: Under Version 3.2 Partners were only required to provide manufacturer or lab data regarding this requirement. EPA is now requiring manufacturers to provide the applicable portions of fixture manual(s) that demonstrate the presence of these controls. By providing fixture-specific documentation, EPA can be assured that all control requirements are being met.		

5) Effective Date: The date that all ENERGY STAR qualified residential lighting fixtures must meet Version 4.0 will be defined as the *effective date* of the agreement. The ENERGY STAR Version 4.0 Eligibility Criteria (aka Specification) for Residential Light Fixtures shall go into effect on **October 1, 2005**. Any previously executed agreement on the subject of ENERGY STAR qualified residential light fixtures shall be terminated effective October 1, 2005.

   A. Qualifying and Labeling Products under the Version 4.0 Specification: All products, including models originally qualified prior to Version 4.0 with a **date of manufacture** after **October 1, 2005**, must meet the new Version 4.0 requirements in order to use the ENERGY STAR on the product or in product literature. The date of manufacture is specific to each unit, and is the date (e.g., month and year) of which a unit is considered to be completely assembled. Manufacturers may begin to test and submit products under Version 4.0 upon EPA's release of the Final specification document.

   B. Elimination of Automatic Grandfathering: EPA does not allow grandfathering under this Version 4.0 specification. Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at that time.

> **Note:** For fixtures that are currently qualified under version 3.2 of the specification to maintain qualification under version 4.0, Partners will be required to complete a version 4.0 Qualified Product Information (QPI) form for each lamp/ballast combination and associated fixtures. In addition, supplemental documentation will be required to be submitted with the QPI form for performance characteristics that did not previously require documentation. For example, efficacy test data would not need to be resubmitted because it is required under version 3.2, but lamp life test data would be required, per version 4.0. In accordance with existing EPA policy, any time that a manufacturer selects a different ballast or different primary lamp for use in fixtures that were previously qualified, EPA should be notified of the change in components and required supplemental documentation for the new component(s) should be provided. For example, if a Partner is requalifying a fixture under version 4.0 and now uses a different ballast than was used at the time of qualification under version 3.2, the Partner should provide supporting documentation for lamp and ballast performance characteristics that have changed, if they have not already done so. Detailed guidelines and instructions for requalifying V3.2 fixtures for V4.0 will be distributed upon the final release of V4.0. EPA encourages Partners to provide feedback about this proposed process for transitioning qualified fixtures from V3.2 to V4.0.

6) Expiration of ENERGY STAR qualification. ENERGY STAR qualification of a fixture will automatically expire 3 years after the date of qualification. Manufacturers that wish to maintain the ENERGY STAR qualification for a product will be required to re-qualify the fixture using current test data (i.e., test data that has been obtained within the six months prior to submitting the fixture for re-qualification).

7) Future Specification Revisions: ENERGY STAR 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 will be arrived at through industry discussions.

   Tier II Requirements: In addition to the requirements defined above, the following second-tier requirements will be integrated into the specification with 180 days notice to Partners:

   1. Each year, a percentage of the lamp/ballast combinations used in qualified fixtures will be randomly selected by EPA for evaluation. For each lamp/ballast combination, a fixture containing that combination will be randomly selected. The manufacturer of each randomly selected fixture will be required to commission third-party testing by a qualified testing lab of that fixture to determine compliance with ENERGY STAR requirements. Products that do not meet all ENERGY STAR requirements will be de-listed.

2. Any interested party that believes a non-compliant fixture has received the ENERGY STAR can initiate a challenge test. Both the challenger and the challenged manufacturer will provide financing prior to third-party testing of the fixture to determine compliance with ENERGY STAR requirements. In the event that the fixture meets all requirements, the fixture remains qualified and the money is returned to the challenged manufacturer. In the event that the fixture does not meet all requirements, the money is returned to the challenger and the product is de-listed.

After integration of these new requirements, fixtures qualified under this Version 4.0 specification will be required to also meet the Tier II requirements by a date to be determined by EPA.