



# ENERGY STAR® Program Requirements for Exit Signs

## Eligibility Criteria

Below is the product specification (Version 3.0) for ENERGY STAR qualified exit signs. A product must meet all of the identified criteria to earn the ENERGY STAR.

1) **Definitions:** Below are the definitions of relevant terms in this document.

A. **Exit Sign:** A sign that is permanently fixed in place and used to identify a means of egress. For the purposes of ENERGY STAR, an exit sign must have an illuminated, legally-required legend. Exit signs that are required by section 7.10.4 of the Life Safety Code to remain illuminated via an emergency power source upon failure of the normal power supply must be designed to comply with this requirement.

B. **Legally Required Legend:** The words "EXIT", "TO EXIT", "STAIR", "TO STAIR", "STAIRS", "TO STAIRS", "FIRE ESCAPE", "TO FIRE ESCAPE", "FIRE EXIT", and "TO FIRE EXIT". This definition will also encompass other combinations of letters and symbols if and when these signs may be listed in accordance with UL 924.

C. **Exit Sign Model:** For the purposes of ENERGY STAR, an exit sign model is an exit sign in the configuration that is actually packaged and sold to end users under a unique model number or name. For exit sign models with an individual rechargeable battery, the battery charger shall be included as part of the exit sign model and shall be tested and qualified as a single product.

D. **Input Power Demand:** The amount of active power required to continuously illuminate an exit sign model, measured in watts (W). For exit sign models with rechargeable batteries, input power demand shall be measured with batteries at full charge.

E. **Power Factor:** A measurement that determines how effectively power drawn by the equipment is converted into actual usable power by an electric component. Power Factor is the ratio between active (useful) power, measured in watts, and apparent power, measured in volt-amperes.

F. **Lagging Power Factor:** With an inductive load, the current lags the applied voltage in a clockwise direction represented on a vector diagram, and is said to be a lagging power factor.

G. **Leading Power Factor:** With a capacitive load, the current leads the applied voltage in a clockwise direction represented on a vector diagram, and is said to be a leading power factor.

H. **NFPA 101, Life Safety Code:** The National Fire Protection Association (United States) (NFPA) develops NFPA 101, Life Safety Code. The Code addresses those construction, protection, and occupancy features necessary to minimize danger to life from fire, including smoke, fumes, or panic. Many states and localities adopt this Life Safety Code into their own Building Code standards.

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

J. **OSHA:** Occupational Safety & Health Administration.

K. **UL 924:** The Standard for Safety for Emergency Lighting and Power Equipment, developed by Underwriters Laboratories.

- 2) **Qualifying Products:** In order to qualify as ENERGY STAR, an exit sign must meet the definition in Section 1A and the specifications in Table 1 below. In addition, EPA requires that each model be listed in accordance with UL 924. Further information about listing to UL 924 may be found under Section 3.A. in Test Procedure. This specification does not apply to exit sign retrofit kits.

<b>Table 1: Product Specifications For ENERGY STAR Qualified Exit Signs (Version 3.0)</b>	
<b>Energy-Efficiency Characteristics</b>	<b>Performance Specification</b>
Input power demand	5 watts or less per sign
Power factor (for electrically-powered, internally-illuminated signs only)	Any leading power factor is satisfactory. A lagging power factor not less than 0.7 is satisfactory.
<b>Reliability Characteristics</b>	<b>Specification</b>
Manufacturer warranty for defects in materials and manufacturing	Replacement of defective parts for 5 years from date of purchase
Product Listing	Listed in accordance with UL 924

- 3) **Test Procedure:** Manufacturers are required to perform tests to determine if an exit sign product model meets the product specifications in Section 2, Table 1. Section A below provides further explanation about the requirement that signs be listed in accordance with UL 924. To determine if the product model meets the energy-efficiency performance specifications in Section 2, Table 1, all performance measurements and calculations must be completed as described Sections B and C. Section B explains the general test conditions for ENERGY STAR qualified exit signs, and Section C outlines the specific procedures for measurement and calculation of the product specifications in EPA.

A: Listing in Accordance with UL 924: Must be completed by an organization recognized by the Occupational Safety & Health Administration (OSHA) as a Nationally Recognized Testing Laboratory (NRTL). A list of OSHA NRTL's may be found at: <http://www.osha.gov/dts/otpca/nrtl/index.html>.

B. Test Conditions to Determine Whether Product Meets Energy-Efficiency Performance

Specifications in Section 2, Table 1:

This section is only applicable to internally-illuminated, electrically-powered products.

All voltages shall be provided within  $\pm 0.5\%$  by a constant voltage power supply.

Prior to input power measurements, the exit sign model shall be operated at the rated input voltage for a period of 100 hours at 25 deg. C  $\pm 10$  deg. C. In addition, the exit sign model with an internal battery shall be operated from the battery for one-and-one-half<sup>1</sup> hours, the minimum period of emergency operation specified in NFPA's "Life Safety Code," and then recharged for the period specified by the sign manufacturer.

All of the light sources in the exit sign model, illuminated when the primary power source is available, must produce light throughout the first 100 hours of non-emergency operation, before any measurements are taken, in order to meet the requirements of this specification. Measurements should be recorded at 25 deg. C  $\pm 10$  deg. C.

C. Measurement and Calculation of Product Specifications in Section 2, Table 1:

This section is only applicable to internally-illuminated, electrically-powered products.

1. Input power demand measurement

The input power demand of the exit sign model in its entirety shall be measured with an appropriate True RMS Watt Meter at the rated input voltage which represents normal operation. For an exit sign model that includes a battery, the battery circuit shall be connected and the

<sup>1</sup> As in current *Life Safety Code*, 7.9.2.1.

battery fully charged before any measurements are made.

## 2. Power factor measurement

At the time of testing for input power demand, the magnitude and waveform of the voltage and current and measurement between them shall also be measured, calculated, and reported.

Testing results shall include:

- Active power measured in watts
- Apparent power based on the formula (rms volt-amperes)
- Power factor based on the formula:

$$\text{Power factor} = \frac{\text{Active power (watts)}}{\text{Total apparent power (rms volt-amperes)}}$$

- Indication of whether the power factor is leading or lagging

D: Submittal of Qualified Product Data to EPA: Partners are required to self-certify those product models that meet the ENERGY STAR guidelines and report information to EPA on a Qualified Product Information (QPI) form.

In the event that an entire exit sign series qualifies for ENERGY STAR, partners should submit a single QPI form for the series, reporting the maximum power consumption. Partners should use “x” designators as appropriate in the model number to indicate characteristics that do not affect power consumption. As an example, stencil exit signs in a single series having optional color front faces may be reported on a single QPI form.

For exit sign series using a common light source for single- and double-faced versions, partners are only required to submit test data for the double-faced version on the QPI form.

- 4) **Effective Date**: The date that manufacturers may begin to qualify products as ENERGY STAR under the Version 3.0 specification will be defined as the *effective date* of the agreement. The ENERGY STAR Exit Sign (Version 3.0) specification shall go into effect on **August 1, 2004**. Any previously executed agreement on the subject of ENERGY STAR qualified exit signs shall be terminated effective July 31, 2004.
- A. Qualifying and Marking Products under the Version 3.0 Specification: All products, including models originally qualified under Version 2.0, with a **date of manufacture** after **August 1, 2004**, must meet Version 3.0 requirements in order to bear the ENERGY STAR mark on the product or in product literature. The date of manufacture is specific to each unit, and is the date on which a unit is considered to be completely assembled.
- B. Elimination of Automatic Grandfathering: Under Version 3.0, EPA has made a significant change with regard to product qualification and marking during specification transitions. **ENERGY STAR qualification under Version 2.0 is not automatically granted for the life of the product model**. To earn the ENERGY STAR mark, a product model must meet the ENERGY STAR specification in effect on the date of manufacture.
- 5) **Future Specification Revisions**: EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment.

Similarly, EPA reserves the right to reconsider and revise the specification at any time that changes to UL 924, the Life Safety Code, or other important codes or standards alter the ability of certain exit signs to achieve a set level of performance, or when evidence suggests the need for a more stringent test procedure or set of eligibility criteria. In keeping with current policy, revisions to the specification are arrived at through industry discussions.