Response to EPA Request for Comments

ENERGY STAR Program Requirements for Exit Signs

Public Comment #1

Energy Star Specification

1) Definitions: Below is a brief description of an exit sign and other terms as relevant to ENERGY STAR.

A. Exit Sign: An internally-illuminated sign that is permanently fixed in place and used to identify an exit from a building. A light source illuminates the sign or letters from within, and the background of the exit sign is not transparent. The exit sign is connected to only one source of power at a time (normal or emergency), and is designed to remain illuminated via an emergency power source upon failure of the normal power supply. The emergency power source is typically either a central back-up generator or an individual rechargeable battery included in each sign.

Public Comment: The definition of exit sign is inconsistent with Underwriters Laboratories' Standard for Safety for Emergency Lighting and Power Equipment, Eighth Edition dated March 29, 1995 with revisions through and including July 11, 2002.

Section 4.18 of that nationally recognized standard for exit signs states that the definition of EXIT SIGN is "A general term used to refer to an Exit Light, Exit Fixture, and Self-Luminous or Photoluminescent Exit Sign."

It is also inconsistent with the 2000 Edition of NFPA 101 Life Safety Code, the NFPA 5000™ Building Construction and Safety Code™ and the NFPA 101B, Code for Means of Egress for Buildings and Structures.

The definition unjustly and unfairly discriminates against non-electrical exit signs (self-luminous tritium and photoluminescent).

If the Energy Star Program is truly to be of benefit to the nation, then it must include all exit signs that are capable of operating under reduced energy consumption in accordance with EPA guidelines.

Public Comment #2

Energy Star Specification

2) Qualifying Products: Any exit sign that meets the definition in Section 1A is eligible for the ENERGY STAR label. This agreement does not apply to exit sign retrofit kits.

Public Comment: If the Energy Star Program is truly to be of benefit to the nation, then it must include all exit signs that are capable of operating under reduced energy consumption in accordance with EPA guidelines.

Public Comment #3

Energy Star Specification

Visibility Characteristics

Letter size and letter spacing

Performance Specification

The sign shall have the word "EXIT" or other appropriate wording in plain legible letters not less than 6 in. (15.2 cm) high with the principal strokes of letters not less that ¾ in. (1.9 cm) wide. The word "EXIT" shall have letters of a width not less than 2 in. (5 cm) except for the letter "I", and the

minimum spacing between the letters shall be not less than 3/8 in. (1 cm). Signs larger than the minimum established in this paragraph shall have letter widths, strokes, and spacing in proportion to their height.[1]

Luminance contrast Greater than 0.8

Average luminance Greater than 15 cd/m_2 measured at normal (0°) and 45° viewing angles.

Minimum luminance Greater than 8.6 cd/m_2 measured at normal (0°) and 45° viewing angles

Maximum to minimum luminance Less than 20:1 measured at normal (0°) and 45° viewing angles

Public Comment: The Performance Specifications appear to come from UL 924. The danger in repeating performance specifications from a UL Standard is that when UL changes their performance specifications, there then becomes a discrepancy between Energy Star Performance Specifications and UL 924 Performance Specifications.

Additionally, and perhaps more importantly, It also sets up a new battle ground at EPA for manufacturers to lobby for changes in EPA Performance Specifications that may not have been approved by Underwriters Laboratories.

EPA is not the proper forum for discussions of Exit Sign performance but rather the energy consumption of exit signs. The proper forum for Exit Sign performance, other than power consumption, is the model code and standards organizations such as NFPA and UL, which provides a balanced consensus process that includes government regulators and industry experts from all parts of the nation.

Therefore, we recommend that a better method of specifying performance specifications is to simply require that Energy Star Exit Signs be listed in accordance with the latest edition of UL 924, Standard for Safety for Emergency Lighting and Power Equipment, Eighth Edition dated March 29, 1995 with revisions through and including July 11, 2002.

This will insure and verify that Energy Star Exit Signs have met all of the appropriate safety, performance and quality control requirements as recognized within the industry, NFPA and other model building codes.

Public Comment #4

Energy Star Specification

4) Test Criteria: Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. To meet the specification, the exit sign model must be tested under the following conditions, all performance measurements and calculations must be completed as described herein, and all the results must comply with the requirements stated in the Eligibility Criteria.

Conditions for testing

Testing shall be conducted in clear (non-smoke) conditions.

All measurements shall be made in a stable ambient air temperature of 25°C ± 5°C.

All voltages shall be provided within ± 0.5% by a constant voltage power supply.

Prior to input power or photometric measurements, the exit sign model shall be operated at the rated input voltage for a period of 100 hours. In addition, exit sign model with an internal battery shall be operated from the battery for one-and-one-half hours, the minimum period of emergency

operation specified in NFPA's "Life Safety Code"[2], and then recharged for the period specified by the sign manufacturer.

[1] As in current NFPA 101, *Life Safety Code*, 7-10.6.1.

[2] As in current NFPA 101, *Life Safety Code*, 7-9.2.1.

All of the light sources in the sign must produce light throughout the first 100 hours of operation, before any measurements are taken, in order to meet the requirements of this specification.

Input power measurement

The input power 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 battery fully charged before any measurements are made.

Photometric measurements

Each of the photometric characteristics of the sign shall be measured at three voltages:

* The rated input voltage which represents normal operation.
* A voltage corresponding to the minimum voltage provided either by the internal battery or a remote emergency power source after one minute of operation, as applicable.
* A voltage corresponding to the minimum voltage provided by the internal battery after the marked rated operating time or at 87.5% of the rated emergency input voltage for signs intended to be connected to a remote emergency power source. The level of illumination of the exit sign shall be permitted to decline to 60 percent of the initial illumination level (specified in Section 3 of the Eligibility Criteria) at the end of the emergency lighting time duration.

All measurements shall be taken with less than 0.01 footcandles of external illumination on the face of the exit sign model.

The luminances shall be measured from two viewing angles: 1) from normal (0°) to the face of the exit sign, and 2) from 45° to the face of the exit sign.

Luminance measurement positions

The positions where the luminances for the legend and background of the exit sign are to be measured are shown below.[3] For instances in which exit sign model has a directional indicator, the positions where the luminances for the directional indicator and its background are to be measured are also shown below.[4]

[3] "Measurement of exit sign luminance" in NFPA 101, *Life Safety Code*, Figure A-7-10.6.3

[4] Found in Figure 40.9 "Directional indicator luminance measurement points" in UL 924, *Standard for Safety: Emergency Lighting and Power Equipment*, May 9, 1995.

Measurement of exit sign luminance **Measurement of directional indicator**

The luminances for each numbered position in the legend and directional indicator shall be measured over a circular area as large as possible while maintaining at least a 1.6 mm distance between the perimeter of the circular area and the adjacent border. The positions for measuring the luminances of the background shall lie within 25.4 mm of the legend and directional indicator but no closer than 1.6 mm to the border.

Luminance calculations

Average luminance *of the legend or background of the legend, whichever is higher, and where applicable, the directional indicator or its background, whichever is higher*. For each, the mean of the luminances of all the positions measured.

Luminance contrast ratio:

$$\text{Contrast} = \frac{Lg - Le}{Lg}$$

Where Lg is the greater luminance and Le is the lesser luminance, either the variable Lg or Le may represent the legend or directional indicator, and the remaining variable shall represent the respective background.

Minimum luminance *of the legend or background of the legend, whichever is higher, and where applicable, the directional indicator and its background, whichever is higher*. For each, the lowest luminance of all the points measured.

Luminance uniformity *of the legend or background of the legend, whichever is higher, and where applicable, the directional indicator and its background, whichever is higher*. For each, the ratio of the highest luminance of any position measured to the lowest luminance of any position measured.

Public Comment: The Test Criteria appear to come from UL 924. The danger in repeating Test Criteria from a UL Standard is that when UL changes their Test Criteria, there then becomes a discrepancy between Energy Star Test Criteria and UL Test Criteria.

Additionally, and perhaps more importantly, It also sets up a new battle ground at EPA for manufacturers to lobby for changes in EPA Test Criteria that may not have been approved by Underwriters Laboratories.

EPA is not the proper forum for discussions of Exit Sign Test Criteria but rather the energy consumption of exit signs. The proper forum for Exit Sign Test Criteria, other than power consumption, is the model code and standards organizations such as NFPA and UL, which provides a balanced consensus process that includes government regulators and industry experts from all parts of the nation.

Therefore, we recommend that a better method of specifying Test Criteria is to simply require that Energy Star Exit Signs be listed in accordance with the latest edition of UL 924, Standard for Safety for Emergency Lighting and Power Equipment, Eighth Edition dated March 29, 1995 with revisions through and including July 11, 2002.

This will insure and verify that Energy Star Exit Signs have met all of the appropriate safety, performance and quality control requirements as recognized within the industry, NFPA and other model building codes.

Public Comment #5

Energy Star Specification

6) 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 are arrived at through industry discussions.

Public Comment: The ability to change the specifications, independent of the model code organizations such as Underwriters Laboratories and NFPA, is simply not in the best interest of the public. This will only lead to confusion and excessive duplication of efforts.

It also sets up a new battle ground at EPA for manufacturers to lobby for changes in Energy Star Specifications that were not approved by Underwriters Laboratories or NFPA.

EPA is not the proper forum for discussions of Exit Sign Performance Specifications and Test Criteria but rather the energy consumption of exit signs. The proper forum for Exit Sign Performance Specifications and Test Criteria, other than power consumption, is the model code and standards organizations such as NFPA and UL, which provides a balanced consensus process that includes government regulators and industry experts from all parts of the nation as well as other parts of the world.

Therefore, we recommend that this section be revised as follows:

6) 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 are arrived at through industry discussions. It is the intent of the Energy Star Program to be consistent and in harmony with the model codes and standards organizations such as Underwriters Laboratories and NFPA.