

Photoluminescent Exit Signs

PURPOSE

The purpose of this interpretation is to provide clarification regarding the required illumination of photoluminescent (PL) exit signs according to Articles 3.4.5.1. and 9.9.11.3. of the National Building Code-2019 Alberta Edition (NBC(AE)).

DISCUSSION

The NBC(AE) permits the use of listed PL exit signs within the scope of both Part 3 and Part 9 under Clause 3.4.5.1.(3)(b) and Sentence 3.4.5.1.(4) and Clause 9.9.11.3.(3)(b) and Sentence 9.9.11.3.(4) respectively.

Objectives and Functional Statements are consistent throughout Articles 3.4.5.1. and 9.9.11.3.

The intent of Sentences 3.4.5.1.(5) and 9.9.11.3.(5) is to limit the probability that electrical circuits for the illumination of exit signs will not operate properly [e.g. due to normal power failure, or will fail or be disconnected due to deficiencies with other non-emergency electrical equipment]. Non operation of the exit signs may result in:

- the exit signs not being illuminated in an emergency situation,
- exit locations not being readily identified,
- delays in the evacuation or movement of persons to a safe place,
- harm to persons.

CAN/ULC-S572 “Photoluminescent and Self-Luminous Signs and Path Marking Systems” is the standard which covers requirements for PL exit signs.

CAN/ULC-S572 states:

Defined Terms:

PHOTOLUMINESCENT SYSTEM(S) - Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

SELF-LUMINOUS - Illuminated by a self-contained energy source other than a battery, such as radioactive tritium gas. Operation is independent of external power supplies or other external forms of energy.

Under normal power failure conditions a PL exit sign is no longer externally illuminated but conforms to Sentence 3.4.5.1.(3)(b) as the charged sign is not powered by an electrical circuit for illumination.

Unless stated otherwise, all Code references in this STANDATA are to Division B of the National Building Code-2019 Alberta Edition

Issue of this STANDATA is authorized by
the Provincial Building Administrator

[Original Signed]
Paul Chang

The logo for the Province of Alberta, featuring the word "Alberta" in a stylized, cursive font with a small blue square at the end of the word.

The charging light source for a photoluminescent exit sign shall not be connected to automatic timers. Under normal building power, continuous illumination of the exit sign is needed for compliance to Sentence 3.4.5.1.(4).

Lighting for exit signs is exempt from certain requirements of the National Energy Code for Buildings 2017 (NECB 2017).

CODE REFERENCES

Sentences 3.4.5.1.(3)-(5) Exit Signs states:

- 3) Internally illuminated *exit* signs shall be continuously illuminated and
 - a) where illumination of the sign is powered by an electrical circuit, be constructed in conformance with CSA C22.2 No. 141, "Emergency Lighting Equipment," or
 - b) where illumination of the sign is not powered by an electrical circuit, be constructed in conformance with CAN/ULC-S572, "Photoluminescent and Self-Luminous Signs and Path Marking Systems."

- 4) Externally illuminated *exit* signs shall be continuously illuminated and be constructed in conformance with CAN/ULC-S572, "Photoluminescent and Self Luminous Signs and Path Marking Systems." (See Note A-3.4.5.1.(4).)

- 5) The circuitry serving lighting for externally and internally illuminated *exit* signs shall
 - a) serve no equipment other than emergency equipment, and
 - b) be connected to an emergency power supply as described in Article 3.2.7.4.

Note: **A-3.4.5.1.(4) Externally Illuminated Signs.** An external lighting source is required to properly charge photoluminescent signs. These types of signs must be lit in conformance with the charging requirements indicated on the exit signs in accordance with CAN/ULC-S572, "Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems."

NECB 2017 Division B:

4.2.1.4. Determination of the Installed Interior Lighting Power

- 1) Except as provided in Sentences (4) and (5), the installed interior lighting power shall include all power used by the luminaires, including lamps, ballasts, transformers, and control devices.

.....

- 4) Lighting for the following functions, spaces or equipment need not be included in the calculation of installed interior lighting power:

.....

- j) exit signs, ...

4.2.2.1. Interior Lighting Controls
(See Note A-4.2.2.1.)

- 20) Except as provided in Sentence (23), the lighting in spaces requiring controls that are "Scheduled Shut-off" in accordance with Table 4.2.1.6. shall shut off automatically during periods when the spaces are scheduled to be unoccupied by means of control devices complying with Sentence (21) that are
 - a) time-of-day operated control devices that automatically turn the lighting off at programmed times, or

b) signals from other automatic control devices or alarm/security systems.

23) Lighting need not be controlled in accordance with Sentence (20) where it is

- a) required to operate continuously due to operational requirements,
- b) located in spaces where patient care is rendered, or
- c) located in spaces where automatic shut-off would endanger the safety or security of the building occupants.

CAN/ULC-S572

PHOTOLUMINESCENT SYSTEM(S) - Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

INTERPRETATION

Charging lights for PL exit signs does not require connection to the emergency power supply as per Sentence 3.4.5.1.(5), or 9.9.11.3.(5), provided the following conditions are met:

1. Under normal building power conditions the PL exit signs are to be continuously illuminated [Sentences 3.4.5.1.(4), 9.9.11.3.(4)] and as required for charging the photoluminescent properties of the PL exit sign such that the PL exit sign will perform its function under a power failure situation.
2. The charging lights shall be on a separate circuit used only for the charging lights.
3. The control for the charging light shall only be accessible to authorized personnel to prevent interference with the equipment.
4. The charging light type and lux shall conform to the listing as required for the PL exit sign.
5. PL exit signs shall be installed in accordance to the listed installation instructions.
6. The PL exit sign shall be labelled in accordance with the time duration for which it has been tested and listed.

This INTERPRETATION is applicable throughout the province of Alberta.