

**STANDARD FOR PHOTOLUMINESCENT AND SELF-
LUMINOUS EXIT SIGNS AND PATH MARKING SYSTEMS**

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STANDARD FOR PHOTOLUMINESCENT AND SELF-LUMINOUS EXIT SIGNS AND PATH MARKING SYSTEMS

ULC Standards is pleased to announce the publication of CAN/ULC-S572-10, Standard for Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems. This Standard is intended to replace and supersede ULC/ORD-C924-02, Photoluminescent and Self-Luminous Exit Signs, which was updated and to which additional requirements for path marking systems have been included.

This First Edition National Standard of Canada has been processed and approved by the ULC Committee on Fire Alarm and Life Safety Equipment and Systems, and published with the date of November 2010. It covers requirements for photoluminescent and self-luminous exit signs and path marking systems. Such equipment is intended to provide exit and directional information to assist occupants to evacuate a facility in the event of an emergency.

This Standard covers requirements for photoluminescent and self-luminous exit signs and egress (exit) path marking systems intended for installation as required by applicable codes. It is worth noting that the 2010 edition of the National Building Code (NBC) of Canada will have a new requirement that mandates the use of pictograms (e.g., "running man" and directional arrows) instead of the language based word, "Exit" as the universal sign for egress. This is in conformance to ISO standards and what is now becoming a universally accepted, language independent symbol for "Exit". It recognizes the importance of photoluminescent technology and how in emergency situation, it is considered more reliable because it will continue to function if emergency power fails. The use of photoluminescent technology is also consistent with the green initiative on reduced need for electricity. To ensure the performance of this product, the NBC will require that all photoluminescent exit signs need to meet CAN/ULC-S572-10.

Should you require any additional information, please contact Tess Espejo at (416) 757-5250 ext. 61212 or at email address: Theresa.Espejo@ca.ulc.com.

This standard is available for purchase at \$195.00 for soft copy or \$235.00 for hard copy from the ULC website (www.ulc.ca) ULC online store.

Yours truly,

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**STANDARD FOR PHOTOLUMINESCENT AND SELF-LUMINOUS EXIT
SIGNS AND PATH MARKING SYSTEMS**

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Prepared and Published by
ULC STANDARDS



Approved by
STANDARDS COUNCIL OF CANADA



First EditionNovember 2010

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APPENDIX A (INFORMATIVE)

A. ADDITIONAL OPTIONAL LIGHT EXPOSURE TESTING

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STANDARD FOR PHOTOLUMINESCENT AND SELF-LUMINOUS EXIT SIGNS AND PATH MARKINGS SYSTEMS

PREFACE

This is the First Edition of CAN/ULC-S572-10, entitled “Standard For Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems”. This Standard is intended to replace and supersede ULC/ORD-C924-02, Photoluminescent and Self-Luminous Exit Signs.

This Edition of the Standard was developed by the ULC Standards Working Group on S572, reviewed by the ULC Standards Subcommittee on Accessory Devices, and was formally approved by the ULC Standards Committee on Fire Alarm and Life Safety Equipment and Systems.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

In Canada, there are two official languages, English and French. Attention is drawn to the fact that some Canadian authorities may require markings and/or installation instructions to be in either or both official languages, except as stated elsewhere in this Standard.

Appendix A, identified as informative, is for information purposes only.

Attention is drawn to the possibility that some of the elements of this Canadian Standard may be the subject of patent rights. ULC Standards shall not be held responsible for identifying any or all such patent rights.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

This Standard is intended to be used for conformity assessment.

1. SCOPE

1.1 This Standard covers requirements for *photoluminescent* and *self-luminous exit signs* and *path marking systems*. Such equipment is intended to provide exit and directional information to assist occupants to evacuate a facility.

1.2 This Standard covers requirements for *photoluminescent* and *self-luminous exit signs* and egress (exit) *path marking systems* intended for installation as required by applicable codes.

1.3 This Standard does not cover requirements for unit equipment or electrically-powered *exit signs*.

2. REFERENCE PUBLICATIONS

2.1 The documents shown below are referenced in the text of this Standard. Unless otherwise stated elsewhere in this Standard such reference shall be considered to indicate the edition and/or revisions of the document available at the date on which this ULC Standard has been approved.

Standards published by the Canadian Standards Association
5060 Spectrum Way, Mississauga, ON L4W 5N6 Canada
Telephone: (800) 469-6727
www.csa.ca

- CSA C22.2 No. 0.15-01 Adhesive Labels
- CSA C22.2 No. 0.17-00 (R 2009), Evaluation of Properties of Polymeric Materials

Standards published by the International Organization for Standardization (ISO) Available from:
ISO Central Office
1, ch. de la Voie-Creuse, Case postale 56 Ch-1211 Geneva 20, Switzerland
Telephone: 41-22-734-0150
www.iso.ch

- ISO 3864-1-2005, Graphical Symbols – Safety Colours and Safety Signs – Part 1: Design principles for safety signs in workplaces and public areas
- ISO 7010-2009, (Amendment 4), Graphical Symbols – Safety Colours and Safety Signs – Safety signs used in workplaces and public areas

Standard Published by the International Commission on Illumination (CIE) available from:
IEC Central Office
3, rue de Varembé P.O. Box 131 CH - 1211 GENEVA 20 Switzerland
Phone: +41 22 919 02 11 Fax: +41 22 919 03 00
www.iec.ch

- CIE/IEC 69-1987, Methods of Characterizing Illuminance Meters and Luminance Meters: Performance, Characteristics and Specifications

Document Published by the National Research Council of Canada
1200 Montreal Road, Bldg. M-58, Ottawa, ON K1A 0R6
Telephone: (800) 672-7990

www.nrc-cnrc.gc.ca

- National Building Code of Canada, 2010

Document Published by Underwriters Laboratories, Inc. (ULI)
333 Pfingsten Road, Northbrook, IL 60062-2096 U.S.A.
Telephone: (847) 272-8800
www.ul.com

- UL 410–06, Slip Resistance of Floor Surface Materials
-

3. GLOSSARY

NOTE: Terms used in this Standard that are in *italic* print are defined as follows:

AUTHORITY HAVING JURISDICTION — The governing body responsible for the enforcement of any part of this Standard or the official or agency designated by that body to exercise such a function.

DIRECTIONAL INDICATOR(S) — A chevron on a text or an arrow on a graphical *exit sign* to identify direction of egress.

DIRECTIONAL MARKER(S) — A part of the *path marking system* that identifies the direction of egress.

EXIT SIGN(S) — A general term used to refer to an exit light, exit fixture, *self-luminous exit sign* or *photoluminescent exit sign*, depicted as a text or *graphical symbol*.

FLOOR PROXIMITY EXIT SIGN — An *exit sign* intended to be mounted with the bottom edge no less than 150 mm (6 in) and no more than 455 mm (18 in) above floor grade.

GRAPHICAL SYMBOL — A pictorial representation (also known as a pictogram) serving as a non-language based visual indicator of meaning.

LEGEND — text based or *graphical symbol exit signs*.

PATH MARKER — A luminous strip or sign intended only for use with a luminous *path marking system* designed to assist building occupants in finding an exit.

PATH MARKER SIGN — A *path marker* that includes text and/or one or more *graphical symbols* intended to provide information related to egress features or procedures.

PATH MARKER STRIP — A *path marker* without text or *graphical symbols*.

PATH MARKING SYSTEM(S) — An integrated collection of *path marker* strips and/or *path marker* signs intended to assist building occupants and/or first responders to deal effectively with evacuation scenarios.

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.

4. EXIT SIGNS

4.1 GENERAL

4.1.1 These requirements apply to *exit signs* that illuminate an integral *legend* for installation in accordance with the applicable codes, including *floor proximity exit signs*.

4.1.2 A text-based *exit sign* shall conform to Subsection 4.2.1, Text Based Exit Signs. For the purposes of this Standard, the word exit shall be either in English, "EXIT", and/or in French, "SORTIE".

NOTE: Refer to Table 5 for French equivalent to English marking used.

4.1.3 A *graphical symbol exit sign* shall conform to Subsection 4.2.2, Graphical Symbol Exit Signs .

4.1.4 The colour scheme of a *graphical symbol exit sign* shall be in accordance with ISO 3864-1, Graphical symbols, – Safety colours and Safety Signs – Part 1: Design principles for safety signs in workplaces and public areas.

4.1.5 Text based *exit signs* shall have distinctively contrasting colours (i.e., light vs. dark) between the *legend* (and *directional indicators*) and background. Where such contrast is not evident a text based *exit sign* shall comply with either:

- A Subsection 4.3.3, Contrast Measurement Test; or
- B Subsection 4.3.2, Exit Sign Observation Visibility Test modified as follows:
 - i. The observers shall be as stated in Clause 4.3.2.2, except that four observers, regardless of age group, shall be used;
 - ii. The evaluation shall be as stated in Clause 4.3.2.3, except that only the *legend* shall be evaluated;
 - iii. The test setup shall be as stated in Clause 4.3.2.4, except that the test area shall maintain reasonably uniform, nominal 323 lux (lx)(30 foot-candle [ft-c]), ambient light conditions between the observers and the *exit signs*;
 - iv. The test shall be conducted as stated in Clause 4.3.2.5 except that the observers require no eye acclimation time prior to the test; and
 - v. In lieu of the calculations of Clause 4.3.2.7, 100 % of the observations shall be correct.

4.1.6 *Exit signs* shall be provided with a means to permanently secure the sign to a mounting surface so it cannot be removed or repositioned without the use of a tool. Adhesive shall not be provided as the sole means for mounting.

4.2 EXIT SIGN LEGEND TYPES

4.2.1 Text Based Exit Signs

4.2.1.1 The minimum overall height of all letters of the *legend* shall be 150 mm (6 in). The ratios of letter height to width, width to stroke width, and stroke width to inter-character spacing shall be as indicated in Table 1. Measurement of the overall dimensions is to include any illuminated borders of the letters. Corners of the letters may be slightly rounded with a maximum radius of 2.5 mm (0.10 in). Letter

dimension measurements, which include such rounded corners, may be extended to the point where the (non-rounded) intersecting lines would otherwise meet. The extrapolation of lines need not be considered when measuring distances between characters.

4.2.1.2 If a text based *exit sign* is provided with *directional indicators* and a means for selecting the proper direction(s) for an installation, the means provided shall conceal or otherwise make indistinguishable, under any condition of use, the *directional indicators* not intended to be used. If the means used to conceal (or otherwise make indistinguishable) an unused *directional indicator* has the shape of or can be confused with a *directional indicator*, the contrast ratio of the concealing means and the background shall not exceed 0.1 as determined in accordance with Subsection 4.3.3, Contrast Measurement Test, except that the luminance measurement points are to be on the means used to conceal unused *directional indicators* and the background. A measurement point on a screw, slot, or slit in the *directional indicator* cover is to be avoided if such points cannot be considered part of a *directional indicator*.

4.2.1.3 The overall sign height and width shall be such that an area of sign background exists, of minimum dimension no less than the required inter-character spacing, between the edges of the *legend* and *directional indicators*, if any, and the outside border or frame of the sign.

4.2.1.4 Dimensions of the letters shall be as specified in Table 2.

4.2.1.5 A *directional indicator* if provided, shall be of a shape and of the minimum dimensions as shown in Figure 1. An increase in any dimension of the *directional indicators* shall proportionally increase the other dimensions. Corners of the *directional indicator* may be slightly rounded with a maximum radius of 1.5 mm (0.060 in). *Directional indicator* dimension measurements, which include such rounded corners, may be extended to the point where the (non-rounded) intersecting lines would otherwise meet. The extrapolation of lines shall not be considered when measuring the distance to the *legend* letters in accordance with Sub-clause 4.2.1.6 (A).

4.2.1.6 If a *directional indicator* is provided as part of an *exit sign*, the construction shall be such that:

- A It is located outside of the *legend* and no less than 9.5 mm (0.375 in) from any letter as shown in Figure 2;
- B It is located at the same end of the sign as the direction indicated; and
- C The direction indicated cannot readily be changed. A *directional indicator* attached with an adhesive is not considered to be readily changeable. This requirement does not preclude a *directional indicator*, the direction of which is determined at the time of installation, but does preclude constructions that allow inadvertent concealment or reversal during cleaning or concealment or reversal by unauthorized persons without the use of tools. The possibility that the faces of a double-faced *directional exit sign* will be inadvertently interchanged is not to be considered for the purpose of this requirement.

4.2.2 Graphical Symbol Exit Signs

4.2.2.1 *Graphical symbols* for *exit signs* shall be in accordance with ISO 7010, Graphical Symbols Safety Colours and Safety Signs – Safety Signs Used in Workplaces and Public Areas, E001, E002, E005, E006. The minimum overall height of the *graphical symbol* shall be 150 mm (6 in). The proportions of the *graphical symbol* shall be as indicated in Figures 3 to 6.

4.3 PERFORMANCE

4.3.1 General

4.3.1.1 All persons performing Subsection 4.3.2, Exit Sign Observation Visibility Test shall have a visual acuity of not less than 20/40 or corrected to not less than 20/40 as determined by using a standard eye chart or by other appropriate means, such as the Titmus Vision Test Series.

4.3.1.2 The *legend* and *directional indicator* of an *exit sign*, if provided, shall be visible as determined by the requirements in Subsection 4.3.2, Exit Sign Observation Visibility Test.

4.3.1.3 For illuminance measurements in lux (lx) or foot-candles (ft-c), the metering equipment shall:

- A Have an accuracy of ± 5 %; and
- B Be cosine corrected.

4.3.1.4 For luminance measurements, the measurement equipment shall:

- A Have an accuracy of ± 5 %;
- B Be colour corrected (f_1') to within 10 % of the CIE relative photopic luminosity curve; and
- C Be rated no more than 5 % susceptible to light outside the measurement area [$f_2(u)$], in accordance with CIE/IEC 69 Methods of Characterizing Illuminance Meters and Luminance Meters: Performance, Characteristics, and Specifications.

4.3.1.5 The visibility tests shall be conducted under each of the following conditions:

- A *Self-luminous exit signs* shall be tested with a luminance representative of the marked date of replacement; and
- B *Photoluminescent exit signs* shall be tested in accordance with Subsection 5.4, Performance.

4.3.2 Exit Sign Observation Visibility Test

4.3.2.1 When the Exit Sign Observation Visibility Test is used as indicated in Clause 4.3.1.2, the test shall be conducted as described in this Subsection.

4.3.2.2 Eight individuals, two each from the age groups 18 to 30, 31 to 40, 41 to 50, and 51 to 70 years, having a visual acuity as specified in Clause 4.3.1.1 shall make the observations as required in Clause 4.3.2.6.

4.3.2.3 *Exit sign* samples representative of production, shall be subjected to the following tests, where (A) and (B) apply to text, and (C) applies to *graphical symbols*:

- A To evaluate *directional indicators* for text based signs, four sample sets of two identical signs configured as follows:
 - i. Set 1 – *directional indicator* on the right, pointing right (out)
 - ii. Set 2 – *directional indicator* on the right, pointing left (in)
 - iii. Set 3 – *directional indicator* on the left, pointing left (out)

- iv Set 4 – *directional indicator* on the left, pointing right (in)
 - B To evaluate a text *legend*, two sample sets of three identical signs each configured with between 10–15 % of the *legend* different between the two sets. For the *legend* “EXIT”, the lower horizontal element of the “E” and the lower right portion of the “X” shall be masked (so that the letters appear similar to “F” and “Y”). For other text *legends*, visual elements of comparable size and significance shall be altered to distinguish between the two sample sets.
 - C To evaluate a *graphical symbol* (pictogram), two sample sets of three identical signs each configured with between 10–15 % of a non-background visual element different between the two sets.

4.3.2.4 The samples are to be positioned above the floor against a flat black surface in a corridor or a similar test area in which the ambient illumination level can be eliminated. The distance between the sign and point of observation shall be measured along a line perpendicular to and through the center of the face of the sign as follows:

- A For a *directional indicator*, 12.2 m (40 ft);
- B For a *legend*, either the viewing distance marked in accordance with Clause 4.7.1.2 or 30.5 m (100 ft), whichever is less.

4.3.2.5 The observers' eyes are to be acclimated for at least 5 min to normal ambient light conditions (538 lx or 50 ft-c) and then allowed to adapt to the dark condition in the viewing corridor for 5 min immediately prior to commencing each set of observations (a set of observations' consisting of either eight signs with *directional indicators* or six signs with *legends*). After each set of observations, the observers' eyes shall be re-adapted to the normal (538 lx or 50 ft-c) light condition for 5 min. The tested signs are to be presented to the observers in random order, with no more than two signs presented at any time. Each observer shall record the distinguishing characteristic of each sign (either the direction of the *directional indicator* or the altered and/or non-altered element of a *legend*) within 10 s of commencing the observation of that sign. If the visual element being observed cannot be distinguished, the observer shall record no observation.

4.3.2.6 The number of correct responses by each observer for each observation set is to be recorded. A correct response is one that correctly identifies the distinguishing element of the sign within 10 s from the beginning of the observation. Lack of a response at the end of 10 s is to be recorded as an incorrect response.

4.3.2.7 The mean (PC) of the correct number of responses is to be determined using Formula 1. If the mean is 80 % or more (6.4 out of 8 for a *directional indicator* observation set, or 4.8 out of 6 for a *legend* observation set), the results are acceptable. If the mean is less than 80 %, the standard deviation (S) and the lower cut-off limit (LCL) are to be determined using Formulas 2 and 3, respectively. Individual data points that fall below the LCL are to be discarded and a revised mean is to be determined. The results are acceptable if the revised mean is 80 % or more.

FORMULA 1:

$$\text{Mean, PC} = \frac{\sum pc(i)_s}{n}$$

FORMULA 2: Sample Standard Deviation

$$S = \left[\frac{\sum [pc(i) - PC]^2}{n - 1} \right]^{1/2}$$

FORMULA 3: Lower Cut-off Limit, LCL = PC – 0.896(S)

in which: pc (i) is the number of correct responses for each individual observer; and n is the number of observers.

4.3.2.8 For the purpose of illustration, consider the following example. The Observation Visibility Test data obtained on an *exit sign* is recorded in Table 3. Since the means was less than 6.4, the standard deviation (S) and the lower cut-off limit (LCL) were calculated using Formulas 2 and 3 given in Clause 4.3.2.7. Since the data for observer Nos. 2 and 3 were below their respective LCLs, they were discarded and revised means were calculated. Since the revised means is more than 6.4, the *exit sign* complies with the requirement stated in Clause 4.3.2.7.

4.3.3 Contrast Measurement Test

4.3.3.1 If required to determine compliance with Sub-clause 4.1.4(A), a sample sign shall be mounted where subject to 323 lx (30 ft-c) illumination evenly imposed on the sign face. The reflected luminance from the sign face shall be measured at ten locations each on the *legend* and on the background, with the measurement points evenly distributed across each area. If *directional indicators* are provided, two measurements are to be made on each *directional indicator*. Background measurement points shall include two each above, below, to the right, to the left, and between the letters of the *legend*. Measurements shall be in accordance with Clause 4.3.3.2.

4.3.3.2 The reflected luminance of the letters and the background is to be measured in units of cd/m² (ft-lamberts) from circular areas not smaller than 0.8 mm (0.030 in) diameter and not larger than the area under test will permit, maintaining a minimum distance of 0.4 mm (0.015 in) between the perimeter of the circular target area and the surrounding edges of the letters, borders, and the sign frame at the selected measurement points. A spacing equal to at least the radius of the target area is to be maintained between the perimeter of the target area and adjacent contrasting borderlines. The luminance values obtained on the letters, on the background, and on the borders (if applicable) are to be separately averaged.

4.3.3.3 The contrast ratio between adjacent luminous elements that require contrast for each element to be visible shall be 0.5 or greater, calculated using the Formula:

$$C = \frac{L_g - L_l}{L_g}$$

in which:

C is the contract ratio;

L_g is the greater luminance, average of measurements; and

L_l is the lesser luminance, average of measurements.

4.4 IMPACT TEST

4.4.1 Each of three samples of an *exit sign* intended for floor proximity installation and marked per Clause 4.7.1.5 shall be subjected to a single impact at any point on the face of the sign. If the manufacturer selects, a single sample may be used for more than one of the three impacts. The points selected are to be such that the impacts produce the most adverse results. The samples are to be mounted or otherwise restrained in a manner representative of the most unfavorable condition of intended installation. The impact is to be produced by a solid, smooth steel sphere, 50.8 mm (2 in) in diameter and weighing 0.54 kg (1.18 lbs). The steel sphere is to be suspended by a cord and swung as a pendulum, dropping through the vertical distance necessary to cause it to strike the surface with the required impact. The impact force is to be 6.8 N•m (5 ft-lbs). The results of the Impact Test are acceptable if there is no cracking, breakage, or detachment of the sign face, lens or diffuser, and no breakage of the means of support or mounting. The sample shall remain functional. In a *self-luminous exit sign*, any cracking of the glow tubes (containers of the radioactive material) is not acceptable.

4.5 RESISTANCE TO ENVIRONMENTAL CONDITIONS

4.5.1 *Exit signs* intended for use outdoors where exposed to sunlight shall be subjected to the ultraviolet light exposure test conditions of CSA C22.2 No. 0.17, Evaluation of Properties of Polymeric Materials. Upon removal from the ultraviolet exposure chamber, the samples are to be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h prior to initiation of the requirements in Subsection 4.3.2, Exit Sign Observation Visibility Test.

4.6 RADIOACTIVE ENERGY SOURCES

4.6.1 *Self-luminous* products utilizing a radioactive material as the energy source are subject to the requirements of the Canadian Nuclear Safety Commission as applied to a generally licensed device, including installation and disposal instructions.

4.7 EXIT SIGN MARKINGS

4.7.1 General

4.7.1.1 *Exit signs* shall be plainly and permanently marked, where the marking will be visible after installation, with:

- A The manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the equipment may be identified;

- B A distinctive catalogue number or the equivalent; and
- C The date or other dating period of manufacture not exceeding any three consecutive months.

Exception: The date of manufacture may be abbreviated, or in a nationally-accepted conventional code, or in a code affirmed by the manufacturer, provided that the code:

- i. Does not repeat in less than 20 years; and
- ii. Does not require reference to the production records of the manufacturer to determine when the unit was manufactured.

4.7.1.2 *Self-luminous exit signs* shall be plainly and permanently marked where the marking will be visible after installation with their date of replacement based on the half life of the contained radioactive material.

4.7.1.3 *Exit signs* evaluated at a viewing distance of less than 30.5 m (100 ft) in accordance with Sub-clause 4.3.2.4(B) shall be marked with the following statement: "NOTICE – Rated Viewing Distance ____". The blank shall contain "15.25 m" ("50 ft") or "22.86 m" ("75 ft") in accordance with the viewing distance at which the sign was found to comply with the requirements. The marking shall be visible after installation and in letters of minimum 3.2 mm (0.125 in) height. The marking shall be permanent in accordance with Clause 4.7.1.4.

NOTE: Refer to Table 5 for French equivalent to English marking used.

4.7.1.4 Marking considered to be permanent include:

- A Moulded and die-stamped;
- B Stamped or etched metal that is permanently secured;
- C Indelibly-printed, pressure-sensitive labels secured by adhesive that, upon investigation, is found to comply with CSA C22.2 No. 0.15, Adhesive Labels, and is rated for the type of surface and temperatures of the surface to which it is affixed; and
- D Painted, stencilled, and ink stamped, other than on a pressure-sensitive label, that is evaluated in accordance with the requirements in Subsection 4.7.2, Permanence of Marking Test.

4.7.1.5 When a marking is required to be visible after installation, the marking shall be on the exterior surface at a location where it will be visible after the equipment is installed. A marking that becomes visible when a cover or trim of the enclosure, or a similar part is removed, without disassembling or removing a component or device, is considered visible after installation.

4.7.1.6 An *exit sign* found to comply with Subsection 4.4, Impact Test, is permitted to be marked where visible during and after installation with the following wording: "Suitable for floor proximity installation."

NOTE: Refer to Table 5 for French equivalent to English marking used.

4.7.2 Permanence of Marking Test

4.7.2.1 If required under Sub-clause 4.7.1.4(D), the manufacturer is to submit two samples of the painted, stenciled, ink stamped, or other means of permanent ink markings applied to the material on which it will be placed. One sample is to be immersed in de-mineralized water for 48 h and the other sample is to be

conditioned for 10 d at 60 °C (140 °F) in an environmental chamber. Upon completion of the conditioning exposures, the markings are to be vigorously rubbed back and forth 10 times, with thumb or forefinger (a total of 20 rubbings). The results are considered acceptable if the marking remains legible.

5. PHOTOLUMINESCENT EXIT SIGNS

5.1 GENERAL

5.1.1 *Photoluminescent exit signs* shall comply with the requirements elsewhere in this Standard as supplemented or modified by this Section 5. Photoluminescent Exit Signs.

5.1.2 *Photoluminescent exit signs* evaluated in accordance with this Standard are complete assembled units ready for installation. Other than a *directional indicator* applied at the time of installation, in accordance with Sub-clause 4.2.1.6(C) all decals, pigments, markings, etc., must be applied by the manufacturer and are not eligible for field installation or modification.

5.1.3 *Photoluminescent exit signs* evaluated in accordance with this Section 5. Photoluminescent Exit Signs, are for indoor dry or damp locations where not exposed to direct sunlight, liquids, or temperatures outside the range of 10 °C to 40 °C (50 °F to 104 °F).

Exception: Signs that have been conditioned in accordance with Subsection 5.4.2.3, Ultraviolet Exposure, and comply with Subsection 5.4, Performance are considered suitable for outdoor wet locations and are permitted to be marked accordingly.

5.2 MECHANICAL CONSTRUCTION

5.2.1 A *photoluminescent exit sign* shall be provided with a rigid structure or mounting means so that the sign remains flat when mounted as intended.

5.2.2 *Photoluminescent pigments* shall be applied uniformly across the *legend* and any *directional indicators*, or across the sign background, in the minimum coating thickness and/or pigment density evaluated for compliance with Subsection 5.4.3, Visibility Tests.

5.3 LEGEND DIMENSIONS

5.3.1 A *photoluminescent exit sign* shall comply with the dimension and location requirements for the *legend* and *directional indicators*, if applicable, as per Subsection 5.1, General.

5.4 PERFORMANCE

5.4.1 General

5.4.1.1 In addition to the requirements of this Subsection 5.4, Performance, *photoluminescent exit signs* shall also comply with the *exit sign* visibility performance requirements of Subsection 4.3.1, General.

5.4.2 Sample Conditioning

5.4.2.1 Mold Stress Relief

5.4.2.1.1 Prior to any other conditioning or testing, *photoluminescent exit signs* with a polymeric structure are to be conditioned for 7 h in an oven maintained at 70 °C (158 °F). Upon removal from the oven, the samples shall be examined for damage, distortion, or warping that could affect the legibility of the sign. The samples are then to be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h, prior to any further conditioning or testing.

5.4.2.2 Humidity Exposure

5.4.2.2.1 All *photoluminescent exit signs* are to be exposed for 72 h in a humidity chamber maintained at 32 °C (90 °F), 85 % relative humidity (RH).

5.4.2.2.2 Upon removal from the humidity chamber, the samples are to be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h prior to initiation of Subsection 5.4.3, Visibility Tests.

5.4.2.3 Ultraviolet Exposure

5.4.2.3.1 *Photoluminescent exit signs* intended for outdoor wet locations shall be subjected to the ultraviolet light exposure test conditions of CSA C22.2 No. 0.17, Evaluation of Properties of Polymeric Materials, instead of Subsection 5.4.2.2, Humidity Exposure.

5.4.2.3.2 Upon removal from the ultraviolet exposure chamber, the samples shall be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h prior to initiation of Subsection 5.4.3, Visibility Tests.

5.4.3 Visibility Tests

5.4.3.1 Light Exposure

5.4.3.1.1 Signs that have been conditioned as per Subsection 5.4.2, Sample Conditioning, shall be subjected to the applicable exposure conditions of Clause 5.4.3.1.2. Each sample set shall be exposed to only one type of illumination source. The number of samples per set shall be determined by the particular visibility test conducted as per Subsection 5.4.3.2, Observation Visibility Tests.

5.4.3.1.2 A sample set shall be exposed for 60 min to one or more of the following light sources, as appropriate for the product markings required by Subsection 5.5, Markings and Installation Instructions:

- A An incandescent lamp at 11 lx (1 ft-c) illuminance;
- B An incandescent lamp at 54 lx (5 ft-c) illuminance with the sign marked in accordance with Clause 5.5.2;
- C A fluorescent lamp at 54 lx (5 ft-c) illuminance with the sign marked in accordance with Clause 5.5.3; or
- D Any other light source type at 54 lx (5 ft-c) illuminance with the sign marked in accordance with Clause 5.5.4.

NOTE: See Appendix A (Informative) for additional optional light exposure testing.

5.4.3.1.3 Illuminance levels noted in Clause 5.4.3.1.2 shall be measured on the face of the sign and shall be uniform within ± 10 % across the sign face. Light sources used for exposures in Sub-clauses 5.4.3.1.2(A) through 5.4.3.1.2(D) shall be as specified in Table 4.

5.4.3.1.4 All samples are to be conditioned as per Subsection 5.4.2, Sample Conditioning, and exposed to light as specified in Clause 5.4.3.1.2 and Subsection 4.3.1, General.

5.4.3.2 Observation Visibility Tests

5.4.3.2.1 Observation of each candidate sign in accordance with Subsection 4.3.2, Exit Sign Observation Visibility Test, shall occur after removal from the light source of Clause 5.4.3.1.2. The sign shall be kept in complete darkness for 120 min until the observations begin, or less if the sign is marked with a rated operating time of 90, 60, or 30 min in accordance with Clause 5.5.7.

5.5 MARKINGS AND INSTALLATION INSTRUCTIONS

5.5.1 *Photoluminescent exit signs* tested in accordance with exposure conditions described in Sub-clauses (B), (C) or (D) of Clause 5.4.3.1.2 shall be permanently marked to specify the required light type and minimum illuminance level in accordance with Clauses 5.5.2, 5.5.3 and/or 5.5.4. Markings shall be visible after installation (for example, on the sign face or an exposed front-facing frame member). The letters shall be a minimum of 1.6 mm (0.08 in) high. The markings shall be paint-stencilled, die-stamped, indelibly lettered, or on a label system suitable for the surface that complies with CSA C22.2 No. 0.15, Adhesive Labels. All markings shall be of a colour that contrasts with the background.

5.5.2 *Photoluminescent exit signs* tested in accordance with exposure condition (B) of Clause 5.4.3.1.2 shall be marked "Min 54 lx external light on sign face at all times of building occupancy".

NOTE: Refer to Table 5 for French equivalent to English marking used.

5.5.3 *Photoluminescent exit signs* tested in accordance with exposure condition (C) of Clause 5.4.3.1.2 shall be marked "Min 54 lx fluorescent light on sign face at all times of building occupancy."

NOTE: Refer to Table 5 for French equivalent to English marking used.

5.5.4 *Photoluminescent exit signs* tested in accordance with exposure condition D of Clause 5.4.3.1.2 shall be marked "Min 54 lx ____ light on sign face at all times of building occupancy." The blank shall specify the type of lighting source used for testing.

NOTE: Refer to Table 5 for French equivalent to English marking used.

Exception: A photoluminescent exit sign tested in accordance with both exposure conditions (C) and (D) of Clause 5.4.3.1.2 may be marked with a single statement combining the information from Clauses 5.5.3 and 5.5.4.

Exception: The phrase "5 ft-c" is permitted to be used in lieu of "54 lx" in the markings of Clause 5.5.2, 5.5.3 or 5.5.4.

5.5.5 All *photoluminescent exit signs* shall be provided with installation instructions that include the following two statements verbatim:

“CAUTION: EXTERNAL ILLUMINATION SOURCE REQUIRED”
<< ATTENTION : SOURCE LUMINEUSE EXTERNE REQUISE >>
and
“SAVE THESE INSTRUCTIONS FOR FIRE SAFETY INSPECTIONS”
<< CONSERVER LA FICHE D'INSTRUCTION POUR LES INSPECTIONS EN SÉCURITÉ INCENDIE >>

5.5.6 Additionally, the instructions shall include the following information in any convenient format:

- A Identification of the minimum required external illumination charging source and time in accordance with the testing conducted under Clause 5.4.3.1.2;
- B Instructions to install *photoluminescent exit signs* only where an external illumination source is present, is deemed reliable and is supplied by a circuit not controlled by automatic timers or sensors and whose controls are accessible only to authorized personnel;
- C Instructions that the reliable external illumination source is to be energized at all times during building occupancy. Energy saving automatic controls utilized when premises are not occupied and accessible only to authorized personnel are permitted provided that illumination is provided for the required charge time;
- D Instructions that lighting levels on the sign are to be reassessed after any changes in external lighting types or levels to determine that the sign is still being illuminated in accordance with its listing;
- E Instructions to periodically clean the sign face with a damp cloth or as otherwise recommended by the manufacturer;
- F Instructions to conduct periodic visibility inspection to ensure that the signs are clear and legible;
- G Unless evaluated in accordance with Subsection 5.4.2.3, Ultraviolet Exposure, a note with the following statement: "This exit sign is for indoor use only. Exposure to direct sunlight, liquid spray or temperature outside the range of 10 °C to 40 °C (50 °F to 104 °F) is not recommended"; and
- H Instructions to ensure rigidity and sufficiency of the mounting.

5.5.7 *Exit signs* subjected to Subsection 4.3.2, Exit Sign Observation Visibility Test, after being in complete darkness for less than 120 min shall be marked with the following statement: "NOTICE - Max Operating Time ____ Minutes". The blank shall contain "90" or "60" or "30" in accordance with the time at which the sign was found to comply with the requirements. The marking shall be visible after installation and in letters of minimum 3.2 mm (0.125 in) height. The marking shall be permanent in accordance with Sub-clauses 4.7.1.4 (A) through (D).

NOTE: Refer to Table 5 for French equivalent to English marking used.

6. PATH MARKING SYSTEMS

6.1 GENERAL

6.1.1 *Path marking systems* intended to provide a visual delineation of the path of egress, including luminous *path marker signs* and *path marker strips* used to identify significant egress path features such as doors, door hardware, door frames, stairs, stair landing, stair banisters, obstacles, egress symbols, information placards and similar elements of the egress path, shall comply with this Section.

6.1.2 *Photoluminescent path marking systems* may include materials such as sheeting and adhesive-backed laminates, along with paints, pigments, or inks pre-applied to a substrate. They are intended for installation where the facility illumination is sufficient to activate the *photoluminescent* material.

6.2 INSTALLATION INSTRUCTIONS

6.2.1 Installation instructions shall be provided with each system, and shall illustrate proper placement of the system with respect to mounting locations, gaps between luminous segments, and changes in direction.

6.2.2 Instructions provided with all systems shall include:

- A Information on any building surface treatment necessary prior to installation;
- B Mounting instructions;
- C Periodic maintenance instructions; and
- D Periodic inspection procedures, including reference to applicable local or national model codes.

6.2.3 Instructions provided with each *photoluminescent* marking system shall include:

- A The minimum amount and type of ambient illumination necessary for the *photoluminescent* system to function as intended, in accordance with the light exposure of Subsection 6.3.3, Light Exposure;
- B An instruction that the control of the ambient illumination be restricted to authorized personnel; and
- C A warning against the use of the system where the ambient illumination level is less than the minimum specified value.

6.2.4 Instructions provided with each *self-luminous* marking system shall include reference to the marked replacement date and appropriate handling and disposal procedures.

6.2.5 Instructions provided with *path markers* found to comply with Subsection 6.3.5, Slip Resistance Test for Stair Nosing and Path Marker Strips, are permitted to indicate the suitability of the *path marker* for installation on stair nosings. Installation instructions for *path markers* that have not been found to comply with Subsection 6.3.5, Slip Resistance Test for Stair Nosing and Path Marker Strips, shall include no statement or implication that they are suitable for installation on stair nosings.

6.3 PERFORMANCE

6.3.1 General

6.3.1.1 A *path marking system* shall be visible as determined by Subsection 6.3.4, Path Marking System Observation Visibility Test.

6.3.1.2 *Path marker signs* shall provide color contrast between the text / symbols and the background sufficient for them to be distinguishable from one another.

6.3.1.2.1 Test samples of *path marker strips* shall be 305 mm (12 in) in length. The width of the test samples shall be considered representative of any greater width of the same material.

6.3.1.2.2 Test samples of *path marker signs* are permitted to be of any size or shape. The overall luminous surface area of the test sample shall be considered representative of any *path marker sign* of greater luminous surface area, regardless of the text and/or symbol portrayed.

6.3.1.3 *Photoluminescent path markers* shall be applied to representative surfaces in accordance with the manufacturer's instructions.

6.3.1.4 Samples of *self-luminous path markers* shall have a luminance representative of that calculated to be present on the replacement date marked on the product and in the installation instructions, as specified in Sub-clause 4.3.1.5 (A) and Clause 6.2.4.

6.3.1.5 *Path markers* intended to be installed on a walking surface shall be subject to conditioning representative of the commercial floor cleaning operations as recommended by the *path marker* installation instructions, after the conditioning required by Subsection 6.6.3.2, Sample Conditioning and prior to Subsection 6.3.3, Light Exposure.

6.3.2 Sample Conditioning

6.3.2.1 *Path markers* containing polymeric materials (including pigments, adhesives, substrates, or structural parts) are to be conditioned for 7 h in an oven maintained at 70 °C (158 °F). After removal from the oven and cooling to room temperature, the samples shall be examined for damage, distortion, or warping that could affect visibility. The samples are then to be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h, prior to any further conditioning or testing.

6.3.2.2 *Path markers* intended for use outdoors where exposed to sunlight shall be subjected to the ultraviolet light exposure test conditions of CSA C22.2 No. 0.17, Evaluation of Properties of Polymeric Materials. Upon removal from the ultraviolet exposure chamber, the samples are to be stored in a dark environment of standard atmosphere and room temperature for a minimum of 24 h prior to initiation of the requirements in Subsection 6.3.3, Light Exposure.

6.3.3 Light Exposure

6.3.3.1 *Photoluminescent path marker* test samples are to be exposed to a light source as indicated below for 60 min, at an intensity of 11 lx (1 ft-c) at the surface of the test samples. The type of light source used for exposure shall be as specified in the instructions, as per Clause 6.2.3. If more than one light source type is specified, separate tests shall be conducted.

- A Fluorescent - Straight tube, T8 or T12, 4000 - 4500 K color temperature lamp seasoned for minimum 100 hours.
- B Incandescent - Soft white, 2700 - 3000 K color temperature lamp seasoned for minimum 45 minutes.
- C LED - Any lamp configuration, 4000 - 4500 K color temperature, seasoned for minimum 2 hours.

6.3.3.2 The samples shall then be stored in total darkness for 120 min, and the observations under Subsection 6.3.4, Path Marking System Observation Visibility Test, shall occur immediately following the 120 min in total darkness.

NOTE: See also Appendix A for Additional Optional Light Exposure Testing.

6.3.4 Path Marking System Observation Visibility Test

6.3.4.1 *Path marker* test samples shall be visible at a distance of 7.62 m (25 ft) under conditions of total darkness, as specified in the procedures outlined in this Subsection.

6.3.4.2 Each sample set is to consist of three identical test samples. Each sample set is to be viewed concurrently by three observers. Prior to each observation set, the observers' eyes shall be acclimated for at least 5 min to normal ambient light conditions (538 lx or 50 ft-c), and then allowed to adapt to the dark condition in the viewing corridor for 5 min immediately prior to commencing each set of observations. No more than two sample sets shall be viewed without repeating the eye adaptation process. Results are considered complying only when all three observers accurately identify the sample set configuration as described in Clause 6.3.4.3.

6.3.4.3 The three test samples for a sample set shall be mounted at a distance of 7.62 m (25 ft) from where the observers will be located, oriented for maximum surface area exposure to the observers. The samples shall be arranged in a manner that requires visual detection of each sample to properly identify the pattern, in accordance with Clause 6.3.4.4. Observers shall individually record the pattern (letter) shape of the sample set. The observation shall be recorded within 10 sec, otherwise the sample set shall be considered as not visible.

6.3.4.4 The sample set pattern for:

- A *Path marker strips*, without a *legend*, shall be in the shape of a letter such as "F", "T", or "H". The individual strips shall be placed immediately adjacent to one another to form the designated letter, with no space between the strips.
- B *Path marker signs* shall be mounted in the shape of a letter such as "V", "L", or "I", with one marker sign located at each end and one located at the center or intersection point of the letter shape. The signs within the pattern shall be spaced apart by 150 mm (6 in) edge-to-edge.

6.3.5 Slip Resistance Test for Stair Nosing Path Marker Strips

6.3.5.1 *Path markers* intended to be installed on stair nosings shall comply with UL 410, Static Friction Test of the Standard for Slip Resistance of Floor Surface Materials, with no coating or contaminating material (water, oil, etc.) applied to either the test sample or the testing apparatus. Separate samples shall be used for this test program. Only *path markers* that comply with this test are permitted to be marked in accordance with Clause 6.4.3 and provided with instructions in accordance with Clause 6.2.5.

6.4 MARKING

6.4.1 Each *photoluminescent* component of a *path marking system* shall be plainly and permanently marked, where the marking will be visible during installation, in accordance with Clause 6.3.3.1 items A – C, and shall be additionally marked "Egress Path Marker".

NOTE: Refer to Table 5 for French equivalent to English marking used.

6.4.2 *Self-luminous path markers* shall be marked, where visible after installation, with their date of replacement and shall be additionally marked, "Egress Path Marker".

NOTE: Refer to Table 5 for French equivalent to English marking used.

6.4.3 *Path markers* found to comply with Subsection 6.3.5, Slip Resistance Test for Stair Nosing Path Marker Strips, are permitted to be marked, where visible during installation, "Suitable for Stair Nosings". This marking is not permitted on *path markers* that have not been found to comply with Subsection 6.3.5, Slip Resistance Test for Stair Nosing Path Marker Strips.

NOTE: Refer to Table 5 for French equivalent to English marking used.

TABLES

TABLE 1
HEIGHT TO WIDTH RATIO OF TEXT-BASED LEGEND

(Reference: Clause 4.2.1.1)

	MAXIMUM	MINIMUM
Overall height to overall width ^a	3:1	not specified
Overall width to stroke width	not specified	2.6:1
Overall stroke width to inter-character spacing	2:1	not specified
^a Except letter "I"		

TABLE 2
TEXT-BASED LEGEND DIMENSIONS

(Reference: Clause 4.2.1.4)

	LETTER HEIGHT		STROKE WIDTH		LETTER WIDTH ^a		SPACING BETWEEN LETTERS	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
Legend ^b	150 min	6 min	19 min	0.75 min	51 min	2 min	9.5 min	0.37 min
NOTES: ^a Except for the letter "I". ^b If the letter height is greater than 150 mm (6 in), then the other dimensions shall increase proportionally in accordance with Clause 4.2.1.1.								

TABLE 3
EXAMPLE OF VISIBILITY TEST DATA ANALYSIS AND CALCULATIONS

(Reference: Clause 4.3.2.8)

OBSERVER NUMBER	NUMBER OF CORRECT RESPONSES
1	5
2	4
3	4
4	5
5	5
6	7
7	6
8	7
Mean (PC)	5.37
Standard deviations (S)	1.19
Lower cut-off limit	4.30
Observer nos. omitted	2 and 3
Revised mean	5.83

TABLE 4
LIGHT SOURCE PARAMETERS FOR SIGN EXPOSURE

(Reference Clause:5.4.3.1.3)

LIGHT SOURCE TYPE	DESCRIPTION	COLOUR TEMPERATURE
Incandescent	Soft white, seasoned minimum 45 minutes	2700 - 3000 K
Fluorescent	Straight tube, T8 or T12, seasoned minimum 100 hours	4000 - 4500 K
Metal Halide	Seasoned minimum 100 hours	4000 - 4500 K
Mercury Vapor	Seasoned minimum 100 hours	3500 - 4000 K
High Pressure Sodium	Seasoned minimum 100 hours	2000 - 2500 K
LEDs	Seasoned minimum 2 hours	4000 – 4500 K

TABLE 5
LABEL DESIGNATIONS

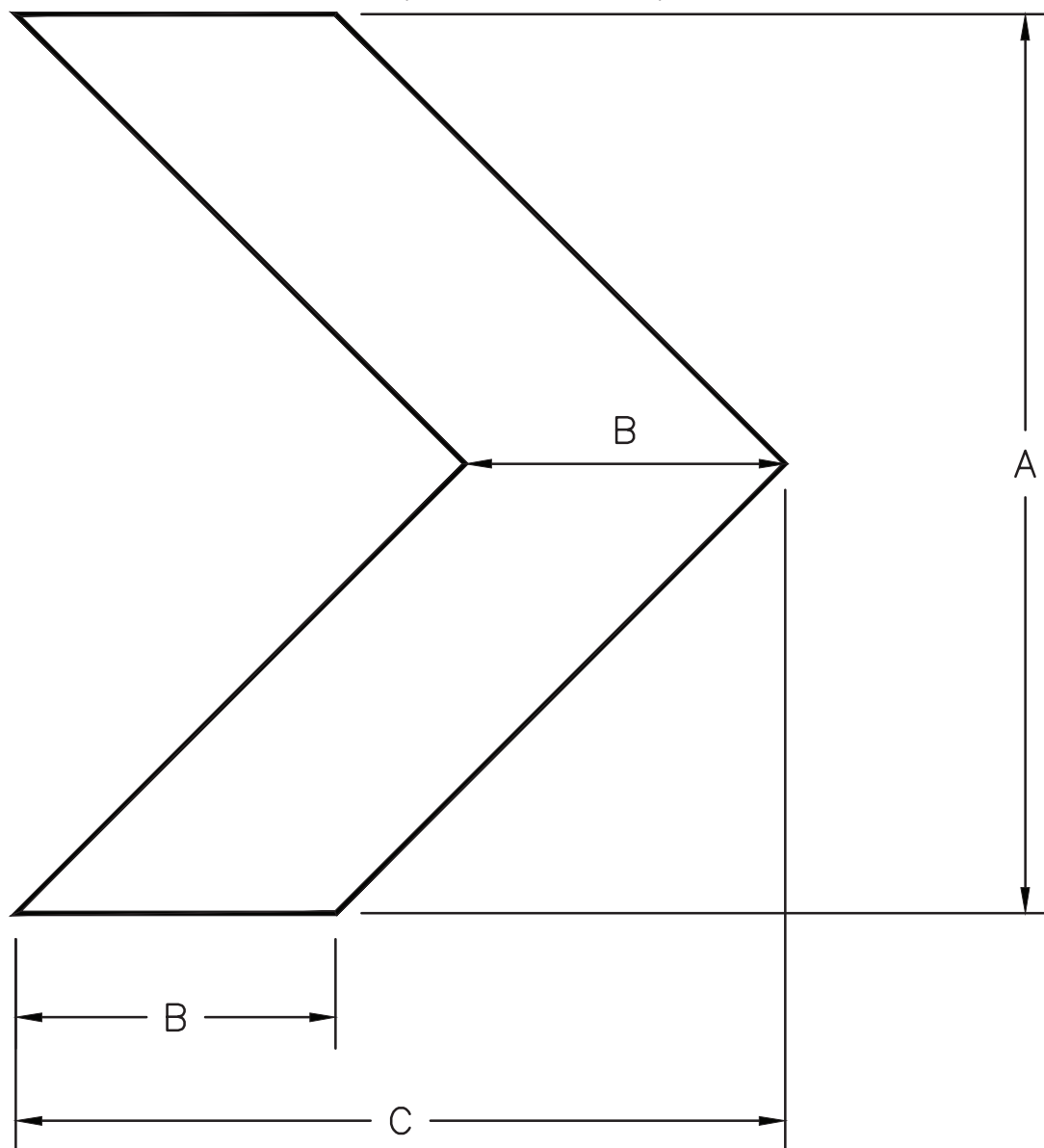
(Reference: Clauses 4.1.2, 4.7.1.3, 4.7.1.6, 5.5.2, 5.5.3, 5.5.4, 5.5.5, 5.5.7, 6.4.1, 6.4.2, 6.4.3, A.2(A), A.2(B) and A.2(C))

REFERENCE CLAUSES	LABEL DESIGNATION IN ENGLISH	LABEL DESIGNATION IN FRENCH
4.1.2	EXIT	SORTIE
4.7.1.3	NOTICE – Rated Viewing Distance “___”	Avis – Distance de visibilité prescrite “___”
4.7.1.6	Suitable for floor proximity installation	Convient pour installation près du sol
5.5.2	Min 54 lx external light on sign face at all times of building occupancy.	Éclairage externe minimum de 54 lx requis en tout temps lorsque le bâtiment est occupé
5.5.3	Min 54 lx fluorescent light on sign face at all times of building occupancy	Éclairage fluorescent minimum de 54 lx requis en tout temps lorsque le bâtiment est occupé
5.5.4	Min 54 lx external light on sign face at all times of building occupancy	Éclairage externe minimum de 54 lx requis en tout temps lorsque le bâtiment est occupé
5.5.5	Caution: external illumination source required	Attention : Source lumineuse externe requise
5.5.5	Save these instructions for life safety inspections	Conserver la fiche d'instruction pour les inspections en sécurité incendie
5.5.7	NOTICE – Max Operating Time ____ Minutes	Avis – Temps maximum de fonctionnement ____ minutes
6.4.1 and 6.4.2	Egress Path Marker	Marqueur de chemin de sortie
6.4.3	Suitable for Stair Nosings	Adéquat pour les nez de marche
A.2 (A)	120 min operation when activated by min 2 h of 54 lx fluorescent light	120 min de fonctionnement lorsque que préactivé pendant au moins 2 h par une source fluorescente de 54 lx
A.2 (B)	30 m viewing distance when activated by min 1 h of 108 lx fluorescent light	Visible à 30 m lorsque préactivé pendant au moins 1 h par une source fluorescente de 108 lx
A.2 (C)	detectable for 24 h from 3 m after activation for 1 h by 54 lx fluorescent light (path marker)	délectable pendant 24 h à partir d'une distance de 3 m lorsque préactivé pendant 1 h par une source fluorescente de 54 lx » (marqueur de parcours)

FIGURES

FIGURE 1 — DIRECTIONAL INDICATOR ON TEXT-BASED EXIT SIGNS

(References: Clause 4.2.1.5)



NO.	MINIMUM DIMENSIONS					
	A _i		B _i		C _i	
	(mm)	(in)	(mm)	(in)	(mm)	(in)
1	31.8	1.25	10.7	0.42	26.5	1.04a
2 ^a	Any size > 31.8	-	Any size > 10.7	-	Any size > 26.5	-
^a Size must be proportionally larger as indicated :						
Relationship			Ratio			
Height: width			1.2:1 maximum			
Height: horizontal stroke width			3:1			

FIGURE 2 — MINIMUM DISTANCE BETWEEN DIRECTIONAL INDICATOR AND LEGEND

(Reference: Clause 4.2.1.6 (A))

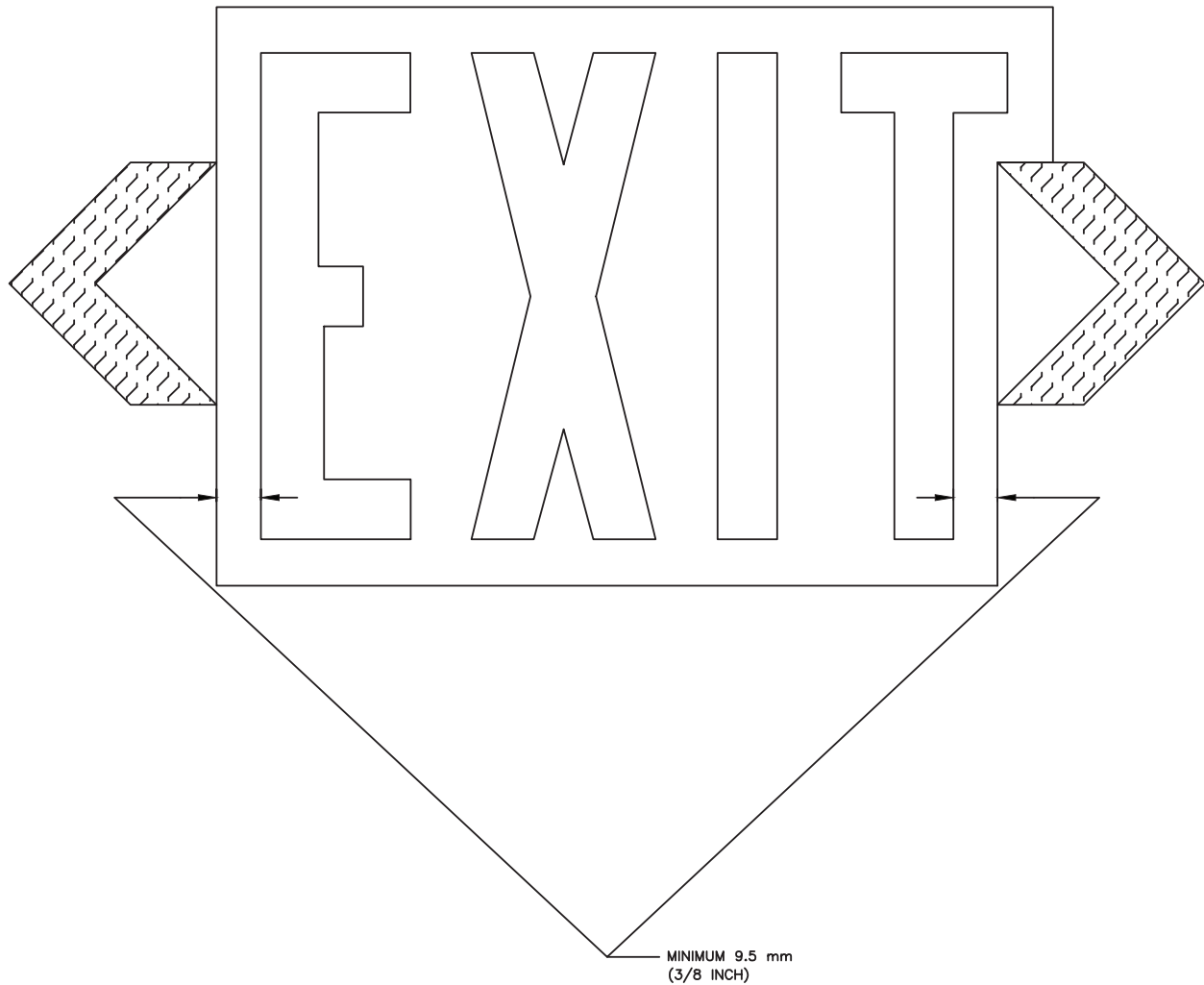
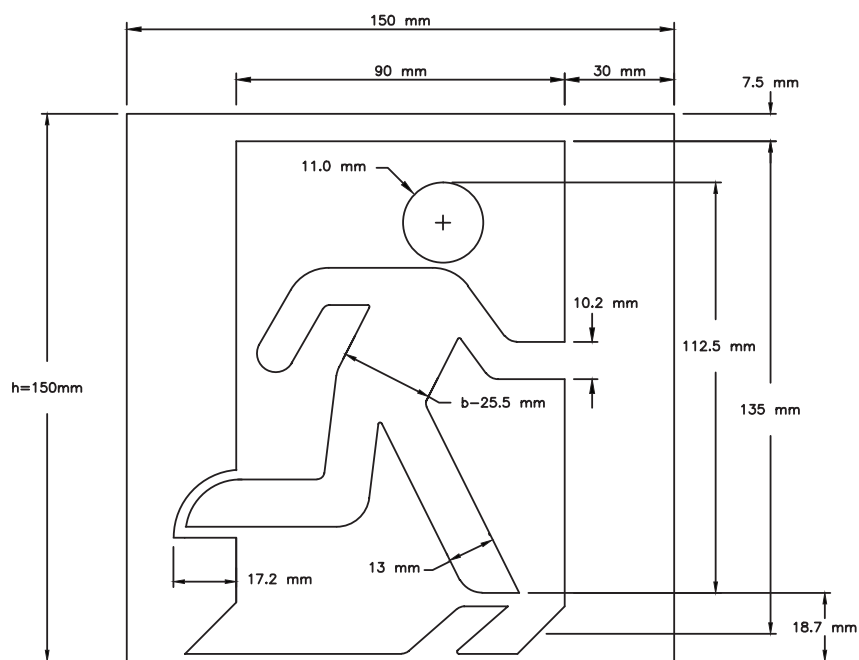


FIGURE 3—RIGHT RUNNING MAN

(Reference: Clause 4.2.2.1)



ISO 7010 E002
Emergency Exit (right hand)

NOTE: $h = 150\text{ mm}$ minimum. Signs larger than 150 mm shall have other dimensions adjusted proportionately.

b = specific part of the body (a function of h)

FIGURE 4 — LEFT RUNNING MAN

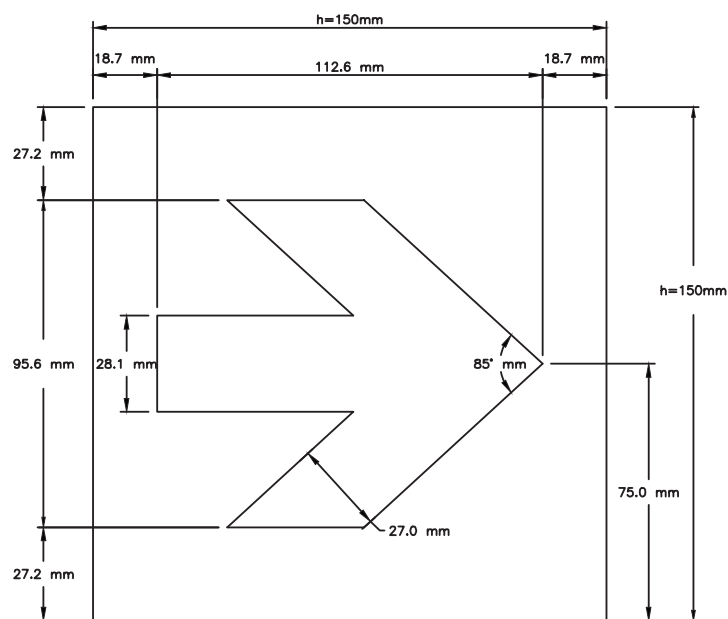
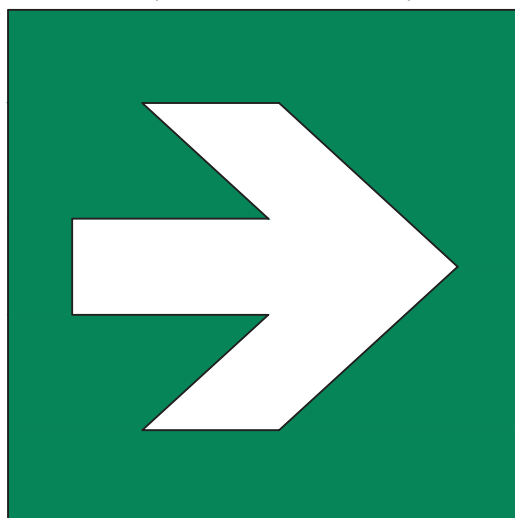
(Reference: Clause 4.2.2.1)



ISO 7010 E001
Emergency Exit (left hand)

FIGURE 5 — ISO E005 DIRECTION SIGN

(Reference: Clause 4.2.2.1)



ISO 7010 E005

Direction, arrow (90° increments), Safe condition

NOTE: $h = 150 \text{ mm}$ minimum. Signs larger than 150 mm shall have other dimensions adjusted proportionately.

FIGURE 6 — ISO E006 DIRECTION SIGN

(Reference: Clause: 4.2.2.1)



ISO 7010 E006
Direction, 45° arrow (90° increments),
Safe condition

APPENDIX A (INFORMATIVE)

A. ADDITIONAL OPTIONAL LIGHT EXPOSURE TESTING

(Reference Clauses: 5.4.3.1 and 6.3.3.2)

A.1 Specific installations of *exit signs* and *path markers* may involve the need for extended operating times, visibility from greater distances, exposure to lower levels of activating light (for *photoluminescent* materials), or higher levels of performance at some intermediate (short term) time period. The test methodologies provided within this standard may be adjusted to develop data to assist in determining whether *exit signs* and *path markers* intended for such installations are able to meet the performance expectations of the facility.

A.2 A product (*exit sign* or *path marker*) that is evaluated using such modified test parameters, in addition to meeting all of the relevant requirements within the body of this standard, may be marked to reflect the supplemental testing performed. This supplemental information may alternatively be provided in a separate test report. Examples of such marking / information are:

- A "120 min operation when activated by min 2 h of 54 lx fluorescent light" (photoluminescent exit sign);
- B "30 m viewing distance when activated by min 1 h of 108 lx fluorescent light"(photoluminescent exit sign); or
- C "detectable for 24 h from 3 m after activation for 1 h by 54 lx fluorescent light" (path marker).

NOTE: Refer to Table 5 for French equivalent to English marking used.

A.3 Any such markings and/or supplemental information should be separate from a certification marking that reflects compliance with the body of the standard and is intended to support an established installation (fire or building) code requirement for *exit sign* or *path marker* visibility.