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Group**

**C866-17**

## **Performance of LED luminaires**

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# C866-17

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# Preface

This is the second edition of CSA C866, *Performance of LED luminaires*. It supersedes the previous edition published in 2012.

This Standard covers the energy efficiency and other performance requirements, as well as the associated test procedures for indoor, outdoor, residential, and commercial light-emitting diodes (LED) luminaires. Performance requirements on standby power and controls were considered, but it was agreed that these would be addressed in future editions of this Standard.

While the previous edition, developed to support the market introduction of LED luminaires, was oriented mostly to residential products, this new edition presents a more simplified set of requirements and testing methodologies that focuses on both commercial and residential applications, both indoor and outdoor.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of BC Hydro, Canadian Electricity Association, Efficiency Nova Scotia, Hydro-Québec, Independent Electricity System Operators, Manitoba Hydro, Natural Resources Canada, Nova Scotia Department of Energy, the Ontario Ministry of Energy, and SaskPower.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Subcommittee on Light-Emitting Diodes, under the jurisdiction of the Technical Committee on Performance of Lighting Equipment and the Strategic Steering Committee on Performance, Energy Efficiency, and Renewables, and has been formally approved by the Technical Committee.

## Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Request for interpretation” in the subject line:*
  - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
  - b) *provide an explanation of circumstances surrounding the actual field condition; and*
  - c) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

*Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at [standardsactivities.csa.ca](http://standardsactivities.csa.ca).*

- 5) *This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Proposal for change” in the subject line:*
  - a) *Standard designation (number);*
  - b) *relevant clause, table, and/or figure number;*
  - c) *wording of the proposed change; and*
  - d) *rationale for the change.*

# C866-17

## Performance of LED luminaires

### 1 Scope

#### 1.1

This Standard specifies energy efficiency and performance requirements for LED luminaires of the directional and non-directional type used for general illumination, including commercial and residential, indoor and outdoor, as well as those with a significant decorative function.

**Notes:**

- 1) *White tunable luminaires and connected luminaires are included in the scope of this Standard.*
- 2) *Safety requirements for luminaires, portable luminaires, self-ballasted lamps, and lamp adapters are provided in CSA C22.2 No. 250.0, CSA C22.2 No. 250.4, and CSA C22.2 No. 1993, respectively.*

#### 1.2

This Standard does not cover LED products that are

- a) intended for roadway lighting and street lighting luminaires covered under CAN/CSA-C653 and CAN/CSA-C811;
- b) direct current (DC) powered luminaires, e.g. PoE luminaires;
- c) intended for indication, e.g., traffic lights and exit signs and pedestrian crosswalk signs;
- d) exclusively intended for decoration or colour changing highlights, e.g., holiday lights, wall washing, and colour changing luminaires;
- e) intended for retrofitting into existing fixtures (LED retrofit);
- f) other solid state lighting (SSL) such as organic light-emitting diodes (OLEDs) and nanotechnology;
- g) integral to equipment or instrumentation and are installed by its manufacturer;
- h) specifically designed for use only during medical or dental procedures;
- i) specifically used in display cases, where the lighting is integral to the display case;
- j) integral to food warming and food preparation equipment;
- k) specifically used for plant growth or maintenance;
- l) an integral part of advertising or directional signage;
- m) specifically used for theatrical purposes, including performance stage, and film and video production; or
- n) specifically intended for television broadcasting.

#### 1.3

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

## 2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

### CSA Group

C22.2 No. 250.0-08 (R2013)

*Luminaires*

C22.2 No. 250.4-14

*Portable luminaires*

C22.2 No. 1993-17

*Self-ballasted lamps and lamp adapters*

CAN/CSA-C653-13

*Photometric performance of roadway and street lighting luminaires*

CAN/CSA-C811-13

*Performance of highmast luminaires for roadway lighting*

### DIN (Deutsches Institut für Normung)

SPEC 5031-100:2015-08

*Optical radiation physics and illuminating engineering — Part 100: Melanopic effects of ocular light on human beings — Quantities, symbols and action spectra*

### IES (Illuminating Engineering Society of North America)

LM-79-08

*Electrical and Photometric Measurements of Solid-State Lighting Products*

### NEMA (National Electrical Manufacturers Association)

NEMA/ANSI C78.377-2015

*American National Standard for Electric Lamps - Specifications for the Chromaticity of Solid-state Lighting Products*

NEMA/ANSI C82.77-10-2014

*Harmonic Emission Limits — Related Power Quality Requirements for Lighting Equipment*

NEMA/ANSI C137.1 (under development)

*Lighting Systems — 0-10 V Dimming Interface for LED Drivers, Fluorescent Ballasts, and Controls*

## 3 Definitions

The following definitions shall apply in this Standard: