

NEMA SSL 4-2012

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# SSL Retrofit Lamps: Suggested Minimum Performance Requirements



**NEMA Standards Publication SSL 4-2012**

***SSL Retrofit Lamps:  
Suggested Minimum Performance Requirements***

*Published by*

**Solid State Lighting Section  
National Electrical Manufacturers Association**

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Rosslyn, Virginia 22209

[www.nema.org](http://www.nema.org)

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## FOREWORD

The NEMA Solid State Lighting Section has prepared this Standards Publication. The objective of this NEMA standard is to provide suggested minimum performance levels for SSL retrofit products. The retrofit market being the first market introduction for most consumers, it is critical that the products being offered meet a minimum standard for form, fit and function, so as to not disappoint or discourage market acceptance and growth. Federal programs such as Energy Star set high performance goals to encourage growth of such products, but do not provide minimum acceptance criteria for products as a whole. Dozens, even hundreds of standards exist for illumination technology, and many of these may be applied to SSL if an examination is first made to determine correct application. This document seeks to call out, tailor and consolidate these performance parameters as able, either by reference or direct quote.

In the preparation of this standards publication, input of users and other interested parties has been sought and evaluated. Inquiries, comments, and proposed or recommended revisions should be submitted to the concerned NEMA product Subdivision by contacting:

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## 1. GENERAL

### 1.1 SCOPE

This standards publication applies to integral Light Emitting Diode (LED) lamps, which are defined as a lamp with LEDs, an integrated LED driver, and a base that meets appropriate American National Standards (ANSs) and is designed to connect to the branch circuit via a lampholder/socket that meets appropriate ANSs. The criteria herein apply to both integral LED lamps of non-standard form, and those intended to replace standard general service incandescent lamps, decorative (candelabra style) lamps, and reflector lamps. Other types of replacement lamps may be added in the future as improvements to LED technology make LED use in other replacement lamp types viable.

### 1.2 REFERENCES

The following normative documents contain provisions, which through reference in this text constitute provisions of this standards publication. By reference herein these publications are adopted, in whole or in part as indicated, in this standards publication. These referenced documents are available from the organizations below. Integral LED lamps shall comply with the relevant clauses of the following standards, unless the requirements of this specification are more restrictive:

ANSI C78.20–2003 *American National Standard for Electric Lamps – A, C, FS, and Similar Shapes with E26 Medium Screw Bases*

ANSI C78.21–2011 *American National Standard Electric Lamps – PAR and R Shapes*

ANSI C78.24–2001 *American National Standard for Electric Lamps – Two-inch (51 mm) Integral-reflector Lamps with Front Covers and GU5.3 or GX 5.3 Bases*

ANSI C78.377-2008 *Specifications for the Chromaticity of Solid State Lighting Products*

ANSI C79.12002 *American National Standard for Electric Lamps – Nomenclature for Glass Bulbs Intended for Use with Electric Lamps*

ANSI/IEC C81.61-2003 *American National Standard for Electric Lamp Bases*

ANSI/IEEE C62.41–1991 *Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits*

CIE Publication No. 13.3 – 1997 *Method of Measuring and Specifying Color Rendering of Light Sources*

CIE Publication No. 18.2 – 1983 *The Basis of Physical Photometry*

IESNA LM-16–1993 *Practical Guide to Colorimetry of Light Sources*

IESNA LM-23–87 – 1989 *Guide for the Selection, Care, and Use of Electrical Instruments in the Photometric Laboratory*

IESNA LM-79–08 *Electrical and Photometric Measurement of Solid State Lighting Products*

IESNA LM-80–08 *Approved Method for Measuring Lumen Maintenance of LED Light Sources*

UL 1993–1999 *Standard for Self-Ballasted Lamps and Lamp Adapters*

UL 8750–2009 *Light Emitting Diode (LED) Equipment for Use in Lighting Products Performance Characteristics Test Procedure*