

NEMA C78.377-2008

American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products





**ANSI_NEMA_ANSLG
C78.377-2008**

American National Standard

for electric lamps—

**Specifications for the
Chromaticity of Solid State
Lighting Products**

American National Standard

Approved: January 9, 2008

Secretariat: American National Standard Lighting Group

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Specifications for the Chromaticity of Solid State Lighting Products

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Foreword

(This foreword is not part of American National Standard C78.377-2008.)

This is a new standard recently developed by the industry.

Suggestions for improvement of this standard should be submitted to the Secretariat C78, American National Standard Lighting Group, 1300 North 17th Street, Suite 1752, Rosslyn, VA 22209.

This standard was processed and approved by the Accredited Standards Committee on Electric Lamps, C78, and the National Electrical Manufacturers Association Solid State Lighting Section technical work group (known at the time as 78 Work Group 09). Committee approval of the standard does not necessarily imply that all committee members voted for that approval.

Amendment / Change	CDV	RV
Revision	C78_4270	C78_4271

Dennis Holt, Chair, ASC78
Yoshi Ohno, Technical Coordinator
Randolph N. Roy, ANSLG Secretariat
Matt Clark, Senior Editor

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Organization of this standard

This standard has been arranged in two parts.

One part includes information on the chromaticity specification basis, explanation of a nominal CCT and target CCT, details of SSL chromaticity requirements, and definition and specification of color rendering index. This part includes tabled information relative to these portions of the standard.

The other part is comprised of a large informative annex, which provides some background information and the technical context in which this chromaticity specification for the SSL products was developed.

The annex includes tabled information on the chromaticity coordinates of the center points and the four corners of each quadrangle for convenience of plotting these quadrangles.

The annex also includes three graphical representations split into two figures (A1 and A2) of the chromaticity specification of SSL products in the tabled information on the CIE (x,y) chromaticity diagram and the (u' , v') chromaticity diagram (Figure A1), and an example of chromaticity tolerance of Flexible CCT at nominal CCT of 3200K (Figure A2).

1. Scope

The purpose of this standard is to specify the range of chromaticities recommended for general lighting with solid state lighting (SSL) products, as well as to ensure that the white light chromaticities of the products can be communicated to consumers. This standard applies to LED-based SSL products with control electronics and heat sinks incorporated, that is, those devices that require only AC mains power or a DC voltage power supply to operate. This document does not cover products that require external operating circuits or additional external heat sinks. This document covers fixtures incorporating light sources as well as integrated LED lamps¹. This document does not cover fixtures sold without a light source. The chromaticity requirement in this standard is for general indoor lighting applications. For other applications, chromaticities of light broader than the range specified in this standard are often acceptable. This standard does not cover SSL products for outdoor applications. This standard also does not cover SSL products for some indoor applications that intentionally produce tinted or colored light.

1.1 Important Patent Disclaimer

It is possible that some of the elements of this document may be the subject of patent rights. When this document was approved for publication, NEMA or ANSLG did not know of any patent applications, patents pending, or existing patents. NEMA or ANSLG shall not be held responsible for identifying any or all such patent rights.

2 Normative references

ANSI C78.376-2001, *Specifications for the chromaticity of fluorescent lamps.*

CIE 13.3-1995, *Commission Internationale de l'Eclairage, Method of Measuring and Specifying Colour Rendering of Light Sources.*

CIE 15: 2004, *Commission Internationale de l'Eclairage, Colorimetry, 3rd edition.*

IESNA LM-79-07², *Illuminating Engineering Society of North America, Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products.*

Specification of Small Chromaticity Differences, D. L. MacAdam, *Journal of Optical Society of America*, 33-1, 1943, pp 18-26. (referred to hereafter as "MacAdam ellipses").

U.S. Department of Energy (DOE) Energy Star Program Requirements for CFLs Partner Commitments – version 4.0, 2007.

¹Integrated LED lamps are light sources with a standardized base that are meant to connect to the branch circuit via a standardized lampholder/socket, (e.g., replacement of incandescent lamps with screw base).

²To be published