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ANSI C78.377-2015

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

National Electrical Manufacturers Association

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

Secretariat:

National Electrical Manufacturers Association

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American National Standards Institute, Inc.

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Foreword (This Foreword is not a part of ANSI C78.377-2015)

This is a revised standard recently updated by the industry.

Suggestions for improvement of this standard are welcome. They should be sent to:

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This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Electric Lamps, C78, and its Work Group, C78WG09. Approval of the standard is not meant to imply that all Work Group members voted to approve it.

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Introduction

The purposes of this standard are, first, to specify the range of chromaticities recommended for general lighting with solid-state lighting products to ensure high-quality white light and, second, to categorize chromaticities with given tolerances so that the white light chromaticity of the products can be communicated to consumers. For this second purpose, the existing chromaticity standard (ANSI C78.376) for fluorescent lamps (FLRs) uses six nominal correlated color temperatures (CCTs), some of which are given names, such as Warm White (3000 K), Cool White (4100 K), and Daylight (6500 K). These names are often printed on product packages to communicate nominal CCT of the products to consumers. 2700 K and 5000 K, however, do not have names. Each of the six FLR lamp nominal CCTs has tolerances given as ellipses in the CIE 1931 (*x, y*) chromaticity diagram. Four-step MacAdam ellipses are used in ANSI C78.376; seven-step MacAdam ellipses and seven-step quadrangles are used in the U.S. Environmental Protection Agency's (EPA) ENERGY STAR specification for Lamps, v1.0.

This chromaticity specification for Light Emitting Diode (LED) products was developed to establish an alignment with existing FLR standards, enabling the consistent appearance of various light sources within spaces where multiple technologies are employed. The use of quadrangles to specify the chromaticities comprising the nominal CCTs increases the overall yield, complying with this standard while acknowledging that chromaticities previously excluded (i.e., within the quadrangles but outside the corresponding MacAdam ellipses) are nonetheless very useful in many applications.

This standard provides a basis for specifying chromaticity, explanation of a nominal CCT, target CCT, D_{uv}, and details of SSL chromaticity requirements. In this 2014 revision, the specifications for nominal CCTs of 2200 K and 2500 K have been added.

The annex in this document provides the background information of this standard and tables and graphical representations of the specifications in this standard, as well as those of tighter specifications expected in the future.

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 lamps, LED light engines and LED luminaires for general indoor lighting applications.

This document does not apply to lighting fixtures sold without a light source. This standard does not apply to SSL products for outdoor applications. This standard also does not apply to SSL products for some indoor applications that intentionally produce tinted or colored light. This document does not include OLED products.

1.1 PATENT DISCLAIMER

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2 Normative References

All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

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

