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ANSI C78.376-2014

American National Standard for Electric Lamps - Specifications for the Chromaticity of Fluorescent Lamps

National Electrical Manufacturers Association

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Secretariat:

National Electrical Manufacturers Association

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Foreword (This foreword is not part of ANSI C78.376-2014.)

This is a revised standard recently updated by American National Standards Committee C78 on Electric Lamps.

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

Secretary, ASC C78
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This standard was developed and approved for submittal to ANSI by Accredited Standards Committee C78 on Electric Lamps and its Working Group, C78WG02. Approval of this standard is not meant to imply that all Accredited Standards Committee members voted to approve it.

This revision modifies specifications for the chromaticity of fluorescent lamps in ANSI C78.376-2001. It updates and partially harmonizes this ANSI standard with the IEC chromaticity color point objectives and chromaticity tolerance in IEC60081, Annex D. The major changes:

a) The color chromaticity mean shall be within a 4-step MacAdam ellipse of the objective chromaticity.
b) 95% of samples shall be within a 5-step MacAdam ellipse of the objective chromaticity.
c) The 3500K objective chromaticity shall be changed to the IEC 3500K objective chromaticity.

Contents

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1 Scope

This standard covers the objectives and tolerances for the chromaticity of fluorescent lamps at their normal 100 hour rating point. The colors included are 2700K, 3000 K/warm white, 3500K/white, 4000K/4100K/cool white, 5000K, and 6500K/daylight. The lamp under test shall be operated under reference conditions as specified in ANSI C78.375, *Guide for Operation of Fluorescent Lamps*, and in the relevant C78 lamp standard. For lamps with non-standardized chromaticity coordinates, the rated x and y values shall be assigned by the manufacturer or responsible vendor.

2 Color Specification Basis

The x and y coordinates used in this specification are based on the 1931 CIE[1] Chromaticity Diagram. Lamps shall be rated in terms of the measurements standards established by the National Institute of Standards and Technology. Tolerances are based on the ellipses defined by David L. MacAdam in his paper "Specification of Small Chromaticity Differences," printed in *Journal of the Optical Society of America*, Vol. 33, No. 1, January 1943, pp. 18-26.

3 Nominal Color Temperature

Values of correlated color temperature (CCT) will vary within a chromaticity tolerance ellipse, since they are a function of color coordinates. For colors that are designated by nominal color temperature, the value shall be based on the CCT of the objective chromaticity.

For new colors, the nominal value of the color temperature shall differ from the CCT of the objective chromaticity by less than 100 K. For a color with a nominal color temperature generally established prior to this standard, the value may be retained when it differs from the CCT of the objective chromaticity by a slightly greater amount.

4 Objective Chromaticities

The objective chromaticities are shown in Table 1.

Table 1
Objective Chromaticities

	x	***y***
2700K	0.459	0.412
3000K/Warm White	0.440	0.403
3500K	0.409	0.394
4000K/4100K/Cool White	0.380	0.380
5000K	0.346	0.359
6500K/Daylight	0.313	0.337

5 Chromaticity Tolerances

For lamps covered by this standard, the distribution of chromaticity coordinates from a representative production sample shall meet the following criteria:

a) Mean of the sample shall be within a 4-step MacAdam ellipse of the objective chromaticity.
b) 95% of samples shall be within a 5-step MacAdam ellipse of the objective chromaticity.

[1] International Committee on Illumination

