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American National Standard for Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment

National Electrical Manufacturers Association

American National Standard

Approved January, 17 2002 Secretariat: ANSLG National Electrical Manufacturers Association

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Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment

American National Standard

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Foreword (This Foreword is not part of ANSI C82.77-2002.)
Suggestions for improvement of this standard should be submitted to the Secretariat C82, American National Lighting Group of the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209. This standard was processed and approved by Accredited Standards Committee on Electric Lamps, C82, and its Work Groups C82-1 and C82-2. Committee approval of the standard does not necessarily imply that all committee members voted for that approval.

Information concerning the approval of this standard is based on the documents listed in the table below:

Amendment / Change	CDV	RV
First Edition	82 (1/2)/m672	82 (1/2)/m673v2

At the time it approved this standard, the ASC 82 Committee had the following members:

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Edward Yandek, Technical Coordinator
Randolph N. Roy, Secretariat and Coordinating Editor
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OSRAM SYLVANIA	Howard Wolfman
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Philips Lighting Company	Al Rousseau
Underwriters Laboratories, Inc.	John Marshall
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Harmonic Emission Limits— Related Power Quality Requirements for Lighting Equipment

1 Scope

This standard specifies harmonic limits and methods of measurement for lighting equipment. This standard covers all types of lighting equipment that is used for general illumination (typically found in residential, commercial, and industrial applications) and which is connected to any of the following commonly distributed 60 Hz alternating current (AC) power line systems:

120V, Single Phase
220/230V, Single Phase
208/240V, Single Phase
277V, Single Phase
480V, 3 Phase

Note: These line voltages are nominal and include commonly encountered nameplate variations of the above. As an example, products rated at either 117, 120, or 125 Volts AC would be covered as being inclusive of nominal 120V systems.

This standard summarizes the de-facto limits that have been employed successfully by the industry thus far and establishes them as appropriate for lighting equipment used in the United States (used in conjunction with US local wiring, building, distribution and lighting practices).

This standard also covers certain special use lighting areas: roadway, sports arena, convention center, stage, and studio.

Limits are only applicable to the specific categories of lighting equipment defined in the standard. All other types of lighting equipment, although covered, do not have limits at this time and do not need to be measured or tested, but shall be deemed to be in compliance with this standard without measurement or testing by the manufacturer or any third party.

Harmonic emission limits, where they are defined by this standard, shall include both harmonic and interharmonic emissions over the low frequency range 0 – 9 kHz. At this time, limits for interharmonics are not specified.

This standard covers lighting equipment regardless of wattage (operating input power level) or operating input current. However, emission limits will only be specified over a range of power or current deemed to be warranted at this time.

The manufacturer's ratings or declared values of operating voltage, operation power, and input line current shall be used where such values are needed to determine appropriate product classification or compliance to this standard. Historical lighting practices and considerations found in other standards ensure that ratings and declared values are representative of production values.

This standard supersedes the requirements for power factor and THD of ANSI C82.11.

Depending upon the specific product, harmonic limits in this standard may be expressed in terms of THD rather than individual limits for specific harmonics or interharmonics. Since there is a technical relationship between harmonic content, THD, and power factor, some products will include PF requirements where the addition of these criteria is helpful in setting a baseline for power quality impact of lighting equipment. Emphasis has been on establishing limits that are simple to assess and that are in keeping with the practices of this industry.

Lighting equipment covered under the scope of this standard which contains only passive electrical components or passive ballast circuitry is exempt from limits and need not be measured or tested, i.e., core and coil ballasts. High reactance autotransformer dimming ballasts for HID lighting are also exempted and need not be measured or tested.

> **Note:** As an example, an electronic starter (which contains an electronic component) is sometimes used in conjunction with passive ballast circuitry. The overall device or equipment would still be classified as a passive ballast circuit.

Lighting equipment that is contained in another product system (i.e., video projector, appliance, copy machine, PC, etc) is not covered by this standard.

Requirements in this standard only apply to normal operating modes for covered equipment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. 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 edition of the standards indicated below.

IEEE 519 -1992, *Recommended Practices and Requirements for Harmonic Control in Electric Power Systems*.

ANSI C82.11-1993 (R1998), *High Frequency Fluorescent Lamp Ballasts*

