NEMA Standards Publication

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

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 C82.77-10-2020.)

Suggestions for improvement of this Standard are welcome. They should be submitted to:

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This Standard was developed and approved for submittal to ANSI by Accredited Standards Committee C82. Approval of this Standard is not meant to imply that all Accredited Standards Committee Members voted to approve it.

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1 Scope

This Standard specifies power quality limits, factors, 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:

120 V, Single Phase
220/230 V, Single Phase
208/240 V, Single Phase
277V, 347 V, Single Phase
480 V, Single Phase
480V/347 V, 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 120 V systems.

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. 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.

This Standard supersedes the requirements for power factor (PF) and total harmonic distortion (THD) of ANSI C82.11, ANSI C82.14, and ANSI C82.16.

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 power quality parameters, some products will include PF, harmonic distortion factor, or displacement factor requirements where the addition of these criteria is helpful to set a baseline for power quality impact of lighting equipment. Emphasis has been on establishing limits that are relatively simple to assess and that are in keeping with the practices of this industry. Alternatively; power quality and emissions are expressed in terms of displacement factor and harmonic distortion factor.

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.

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.

1.1 Normative References

IEEE Std 1459 IEEE Standard Definitions for the Measurement of Electric Power Quantities Under Sinusoidal, Non-sinusoidal, Balanced, or Unbalanced Conditions.