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American National Standard for Lighting Systems—Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems

National Electrical Manufacturers Association

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American National Standard for Lighting Systems— Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems

Secretariat:

National Electrical Manufacturers Association

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Foreword

Utilizing Power over Ethernet (PoE) technology to provide power and communication to a lighting system can provide benefits including high energy efficiency, simplified installation, and high bandwidth data transmission. However, resistive line losses within PoE lighting distribution systems utilizing CAT5/6 cabling can exceed 15% depending on the gauge of PoE cable selected, resulting in an overall system efficacy that can be significantly lower than traditional AC-powered 120–480 V lighting systems. Utilizing a cable with an appropriate wire gauge can limit these losses and help ensure a PoE lighting system that can match or exceed the efficacy of a traditional 120–480 V AC lighting system.

This standard establishes the minimum gauge of wire to limit resistive line losses and support an energy efficient PoE lighting system. This standard was developed by a committee including lighting manufacturers, PoE equipment manufacturers, electric utilities, and energy efficiency performance rating organizations. The commercially available gauge sizes specified by the standard have been chosen to result in average resistive line losses of less than 5% of total power delivered across typical installations assuming an average cable length of 50 m.

At the time this standard was approved the ANSI C137 committee was composed of the following members:

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1 Scope

1.1 This standard specifies the minimum requirements for installation of Power over Ethernet (PoE) lighting systems to ensure minimal energy losses. A typical PoE lighting system uses standardized Ethernet twisted pair cable (e.g. category 5e cable) to connect powered devices (PDs), such as luminaires, to DC power source equipment (PSE) (e.g., network switch) without the need for AC line voltage power to the luminaires. The Ethernet cable also carries data for control and monitoring of the luminaire.

1.2 The energy efficiency of a PoE lighting system depends on three elements: PSE efficiency, PD efficiency, and cable energy losses. This standard specifies cable and installation practices to limit the electrical energy losses of the cable between the PSE and the PD.

1.3 Applications include, but are not limited to, commercial, residential, and industrial lighting applications.