ANSI/IES LM-46-20

Illuminating ENGINEERING SOCIETY

APPROVED METHOD:
PHOTOMETRIC TESTING OF INDOOR LUMINAIRES USING HIGH INTENSITY DISCHARGE OR INCANDESCENT FILAMENT LAMPS

AN AMERICAN NATIONAL STANDARD

Approved American National Standard ANSI

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Prepared by the IES Testing Procedures Committee.

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1.0 Introduction and Scope

1.1 Introduction

This Approved Method is intended to promote uniform test results as obtained under controlled laboratory conditions in measuring the luminous flux and intensity of high intensity discharge (HID) and incandescent indoor-type luminaires.

This document is a revision of and replacement for LM-46-04 (Reaffirmed 2012), *IESNA Approved Method for Photometric Testing of Indoor Luminaires Using High Intensity Discharge or Incandescent Filament Lamps*.

1.2 Scope

The photometry of luminaires with high intensity discharge (HID) lamps, including mercury vapor, high-pressure sodium (HPS), or metal halide lamps, is covered by this method. Also covered are similar luminaire types employing incandescent lamps, including tungsten-halogen lamps. For the unique testing requirements of entertainment lighting luminaires (i.e., for stage, TV, or film) using HID and incandescent lamps, the reader should consult *ANSI/IES LM-73-18, Approved Method: Photometric Testing of Entertainment Lighting Luminaires Using Incandescent Filament or High-Intensity Discharge Lamps*.[1] Because of their special characteristics, low-pressure sodium lamps and fluorescent lamps are not discussed in these procedures. For information on fluorescent lamp testing, the reader should consult *ANSI/IES LM-41-20, Approved Method: Photometric Testing of Indoor Fluorescent Luminaires*.[2]

2.0 Selection of Lamps

The lamps selected shall conform to the lamp manufacturer's nominal design dimensions and parameters. Lamps with phosphor coatings shall be carefully selected to obtain a phosphor density uniform over the entire lamp envelope. It is important to ensure that the centering of the arc tube and other mechanical details are within the limits recommended by the American National Standards Institute (ANSI).[3]

3.0 Selection of Luminaires

Each luminaire selected should be representative of the manufacturer's typical product. The luminaire shall be clean, except in cases where dirt depreciation measurements are the reason for the photometry. Precise location of the lamp within the luminaire can be extremely important, particularly in the case of beam forming equipment.

4.0 Test Conditions

4.1 Extraneous Light

Extraneous light is any light that reaches the photodetector other than directly from the source being measured (or reflected from the mirror of a moving-mirror photometer) because of extraneous reflections or other light sources. Adequate precautions shall be taken to minimize such reflections by using flat black surfaces and by using angles, grooves, baffles, and other light traps.

Extraneous light can be measured by running a complete or partial test with the direct light from the luminaire completely shielded from the photodetector. The photodetector then sees only extraneous light, which can be measured, recorded, and then subtracted during the calculation of the luminaire luminous intensities. Care shall be taken to block only direct light while simultaneously providing minimal interference to extraneous light paths.

4.2 Ambient Temperature

For precise measurement of photometric and electrical characteristics of luminaires with HID and incandescent lamps, the ambient temperature should be maintained at 25 °C ± 5 °C (77 °F ± 9 °F). This temperature shall be measured at a point not more than 1.5 meters (5 feet) from the lamp or luminaire and at the same height as the lamp or luminaire. The temperature-sensing device shall be shielded from direct radiation of the light source. Any deviations from the recommended temperature specifications shall be noted in the report.