ANSI/IES LM-11-20

Illuminating ENGINEERING SOCIETY

APPROVED METHOD: PHOTOMETRIC TESTING OF SEARCHLIGHTS USING INCANDESCENT OR HID SOURCES

AN AMERICAN NATIONAL STANDARD

Approved American National Standard ANSI

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Suggestions for revisions should be directed to the IES

Prepared by
The IES Testing Procedures committee

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Foreword

The original guide for the "Photometric Testing of Searchlights" was started in 1951 and published in March of 1958. The Searchlight Committee and the Committee on Testing Procedures for Illumination Characteristics, along with T. H. Projector of the National Bureau of Standards, were instrumental in developing the final draft of that first report.

In general, this guide follows the same format but replaces the 1958 version and represents a revision to the 1997 guide. Main changes include: 1) an update of the references, including the addition of IES LM-75 for detailed information on goniophotometer types and photometric coordinates; 2) an update of the examples of typical searchlight systems; and 3) the introduction of the International Commission on Illumination (CIE) value f_1' as a measure of the acceptability of the spectral response of a photodetector used in measurement.

1.0 Objective and Scope

This Approved Method applies to lighting equipment having a total field angle of less than ten degrees (refer to **Normative Reference 2.1**). (**Section 6.6** provides an example for obtaining test data on field angle.) This includes equipment in which light is controlled by reflectors, lenses, or their combinations. The document applies to projectors with a variety of light sources, including tungsten filament, tungsten-halogen, and high-intensity discharge lamps. It does not apply to projector systems composed of arrays of light emitting diodes. For luminaires where the total field spread is equal to or exceeds ten degrees, the reader is referred to ANSI/IES LM-35-20.[1] Photometric testing of reflector-type lamps is described in ANSI/IES LM-20-20.[2]

2.0 Normative References

2.1 ANSI/IES LS-1-20

Illuminating Engineering Society. Nomenclature and Definitions for Illuminating Engineering. New York: IES; 2020. Available online: www.ies.org/standards/definitions/. (Accessed 2019 Jun 28).

2.2 ANSI/IES LM-45-20

Illuminating Engineering Society. IES Approved Method for the Electrical and Photometric Measurement of General Service Incandescent Filament Lamps. New York: IES; 2020.

2.3 ANSI/IES LM-51-20

Illuminating Engineering Society. Approved Method: Electrical and Photometric Measurements of High-Intensity Discharge Lamps. New York: IES; 2020.

2.4 ANSI/IES LM-54-20

Illuminating Engineering Society. IES Guide to Lamp Seasoning. New York: IES; 2020.

3.0 Nomenclature and Definitions

The terms used in this document follow the definitions given in **Normative Reference 2.1**. Additional terms are defined below.

3.1 auxiliary equipment

The ballast and the igniter needed for the proper operation of discharge lamps.

3.2 units

The units of electrical measurement used in this Approved Method are the volt, the ampere, and the watt. The units of photometric measurement are the lumen and the candela. Color is specified in terms of the CIE recommended systems.

4.0 Physical and Environmental Test Conditions

4.1 General

Changes in ambient temperature or air movement have little influence on the electrical and photometric characteristics of incandescent filament and HID lamps. In the case of HID lamps, the discharge tube is encapsulated inside an outer bulb, which provides a level of thermal and airflow isolation. Thus, the luminous