ANSI/IES TM-28-20

Illuminating Engineering Society

APPROVED METHOD:
PROJECTING LONG-TERM LUMINOUS FLUX MAINTENANCE OF LED LAMPS AND LUMINAIRES

AN AMERICAN NATIONAL STANDARD

Approved American National Standard ANSI

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1.0 Introduction and Scope

1.1 Introduction

The objective of this Technical Memorandum is to provide guidance and recommended procedures for sampling, test intervals and duration, and a method for long term luminous flux maintenance projection for LED lamps and luminaires. The intent is to help product manufacturers and users, standards developing bodies, and other organizations to avoid any unnecessary burdens related to excessive product testing.

A balance was sought between testing time and effort on one side, and sufficient statistical rigor on the other. A direct and a combined method for luminous flux maintenance projection are proposed; the latter allows the use of luminous flux maintenance data obtained for both the lamp or luminaire being tested, and the LED sources used in it.

Typically, test data for LED sources are available for at least 6,000 hours prior to the design of lamps or luminaires with them. This provides the starting information for the luminous flux maintenance projection according to the combined method. That method also takes into account any detectable further contribution from the remaining lamp or luminaire components, rather than using only LED-source test data as a proxy. As a result, the luminous flux maintenance projection for the lamp or luminaire can begin as early as 3,000 hours into the testing when the protocol proposed by this document is followed.

1.2 Scope

This document recommends the methods for projecting long-term luminous flux maintenance of LED lamps and luminaires using data obtained when testing them per *ANSI/IES LM-84-20, Approved Method: Measuring Optical Radiation Maintenance of LED Lamps, Light Engines, and Luminaires*, as well as data when testing LED sources per *ANSI/IES LM-80-20, Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules*.

2.0 Normative References

2.1 ANSI/IES LM-80-20

Illuminating Engineering Society. Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules. New York: IES; 2020.

2.2 ANSI/IES TM-21-19

Illuminating Engineering Society. Technical Memorandum: Projecting Long-Term Lumen, Photon, and Radiant Flux Maintenance of LED Light Sources. New York: IES; 2019.

2.3 ANSI/IES LM-84-20

Illuminating Engineering Society. Approved Method: Measuring Optical Radiation Maintenance of LED Lamps, Light Engines, and Luminaires. New York: IES; 2020.

3.0 Definitions

3.1 device under test (DUT)

An LED lamp or luminaire under test.

3.2 sample set

The plurality of LED lamps or luminaires being tested under a given test condition.

4.0 Samples and Test Data

4.1 Samples

4.1.1 Sampling Selection Recommendations. Commercial users of the information and analysis resulting from this document will, in general, assume that the data are "production representative" unless otherwise stated. "Production representative" means produced using production materials, with production processes and production assembly personnel, though not necessarily in a full production mode (for example, the units may be from a production pilot run). Not all testing is intended to serve the same purpose. This document provides a standardized method that may be appropriate.