



Illuminating
ENGINEERING SOCIETY

TECHNICAL MEMORANDUM:
STANDARD FORMAT FOR THE ELECTRONIC
TRANSFER OF LUMINAIRE OPTICAL DATA
AN AMERICAN NATIONAL STANDARD

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ANSI/IES TM-33-23

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LUMINAIRE OPTICAL DATA
AN AMERICAN NATIONAL STANDARD**

Publication of this Technical Memorandum
has been approved by IES.
Suggestions for revisions
should be directed to IES.

Prepared by the the IES Computer Committee



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Preface

This preface is not part of ANSI/IES TM-33-23. It is included for informational purposes only.

Updates in the 2023 version:

- Angular Color

An `AngularColor` complex element (**Section 4.5.18**) has been added.

- Horizontal Symmetry

A `Symm` element has been added to these sections:

- 4.5.14.1 Luminous Intensity
- 4.5.15.3 Radiant Intensity
- 4.5.16.3 Photon Intensity
- 4.5.17.2 Angular Spectral
- 4.5.18.2 Angular Color

- Multiplier

A `Multiplier` element has been added to these sections:

- 4.5.14.1 Luminous Intensity
- 4.5.15.3 Radiant Intensity
- 4.5.16.3 Photon Intensity
- 4.5.17.1 Emitter Spectral
- 4.5.17.2 Angular Spectral
- 4.5.18 Angular Color
- 4.5.19 Illuminance
- 4.5.20 Irradiance
- 4.5.21 Photon Flux Density
- 4.5.22 Spectral Irradiance

- Absolute

An `Absolute` element has been added to these sections:

- 4.5.15.1 Radiant Intensity
- 4.5.16.1 Photon Intensity
- 4.5.17.2 Angular Spectral
- 4.5.18.1 Angular Color
- 4.5.19.1 Illuminance
- 4.5.20.1 Irradiance
- 4.5.21.1 Photon Flux Density
- 4.5.22.1 Spectral Irradiance

- Normalized

A `Normalized` element has been added to **Section 4.5.17.1 Emitter Spectral**.

- Timestamp

A `Timestamp` element has been added to **Section 4.5.17.1 Emitter Spectral**.

- Quantum

A `Quantum` element has been added to **Section 4.5.17 Emitter Spectral**.

- JSON Document Format

An equivalent JSON specification to the XML document specification is shown in **Section 4.8 JSON Document Format**.

1.0 Introduction and Scope

1.1 Introduction

The architectural and roadway lighting communities have long relied on standardized data formats for the electronic transfer of far-field photometric data and related information. These data formats include IES LM-63-02, ANSI/IES LM-63-19, CIBSE TM14, and EULUMDAT. Apart from a few minor revisions, these data formats have remained essentially unchanged for the past several decades.

With the introduction of solid-state lighting with color-changing capabilities, there is a need to include spectral power distributions in these data representations. There is also a need to represent radiant and photosynthetically active radiation (PAR) intensity distributions for horticultural, aquacultural, and animal husbandry lighting applications. Unfortunately, it is difficult to impossible to incorporate such information in existing photometric data standards. It is also unreasonable to develop new standards specifically for specialized applications, such as horticultural lighting. This document therefore presents a standardized data format for use with all lighting applications.

The represented data may be obtained when testing or simulating the optical characteristics of a luminaire, which may then be used with lighting design and analysis software, architectural visualization software, or optical design software.

The data is formatted in accordance with W3C Extensible Markup Language (XML) 1.1 Recommendation and the W3C XML Schema Definition Language (XSD). This allows end users to utilize and view the data directly without the need for proprietary software.

In the event of any ambiguity or discrepancy with respect to the textual specification and the XML Schema in this document, the XML Schema shall take precedence.

In the event of any ambiguity or discrepancy with respect to the description of XML or XML Schema in this document, the W3C Recommendations shall take precedence.