

**IESNA LM-74-05**

**IESNA  
Standard  
File Format  
*for*  
the Electronic  
Transfer  
*of*  
Luminaire  
Component  
Data**

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Prepared by:  
The Luminaire Component Data subcommittee of  
the IESNA Computer Committee



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## IESNA Standard File Format for the Electronic Transfer of Luminaire Component Data

Publication of this Committee  
Report has been approved  
by the IESNA. Suggestions for  
revisions should be directed  
to the IESNA.

**Prepared by:**  
**The Luminaire Component Data subcommittee of**  
**the IESNA Computer Committee**

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# IESNA Standard File Format for the Transfer of Luminaire Component Data

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## FOREWORD

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Since the introduction of the *IESNA Standard File Format for Electronic Transfer of Photometric Data* (LM-63), there has been ongoing pressure to include more *non-photometric* information in LM-63. The IESNA Computer Committee has determined that adding such information to the file format in LM-63 is inappropriate, and that an alternative method was needed. Therefore, the Committee has developed *IESNA Standard File Format for the Electronic Transfer of Luminaire Component Data* (LM-74) with a new file format that contains **luminaire component data**.

This new Luminaire Component Data format is designed to transfer luminaire-related data through a series of specific component elements while retaining the photometric file of LM-73 to transfer photometric performance data.

---

## 1.0 INTRODUCTION

---

The transfer of luminaire data between manufacturers, software developers, and end users has made apparent the need for a standard format for luminaire data transfer.

This document (LM-74) describes a flexible, single file system that can be used for both small and large amounts of data. Here, data is presented in a structured XML format. This allows software developers to readily incorporate the data into their products, or permits lighting designers and other end users to utilize the data directly.

This is the first version of a developing standard. It establishes the rules and guidelines for creating a Luminaire Component Data file.

### 1.1 Objective

To facilitate the flow of information within the lighting community, the IESNA Computer Committee has developed a well-defined method for the electronic data transfer of luminaire component information to end users *from* component manufacturers or independent data suppliers.

The currently-identified luminaire components are lamp, ballast, photometry, and fixture. This first version of LM-74 concentrates on **lamp data** with the development of lamp field names and their corresponding data. Subsequent editions will define the formats for the remaining luminaire components.

A minimally restrictive format has been adopted. This flexibility is intended to accommodate growth, absorb changes, and allow for unanticipated future use.

All aspects of the format structure, including data names, their definitions, and the expected data itself, are well-defined so that the end user can unambiguously understand, interpret, and use the data being transferred.

LM-74 is not intended to develop or define the potential end uses of luminaire component data, but rather to provide for the consistent transfer of data to these end uses.

### 1.2 Need for Format

The following are examples of some potential LM-74 users along with their expected needs:

- A luminaire manufacturer who wants to list the different lamp data, ballast data, image data, and/or other information that can be used with a particular luminaire.
- An architect or engineer who wants to specify the use of a certain lamp and/or ballast for a project.
- A specifier who wants to see what product combinations are available that match a specific criteria.

- A software developer who wants to show the specifications of lamps and ballasts that meet certain criteria.
- A user looking for products compatible with existing lighting systems (for maintenance purposes).

### 1.3 Scope

This document (LM-74) describes the Luminaire Component Data format and explains how to generate a file using this format, which is designed for data transfer only. It is not intended as a format for data storage, data retrieval, or for use as a database.

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## 2.0 XML OVERVIEW

---

A Luminaire Component Data file is an XML document. XML is a meta-language that identifies structured information. The XML specification is published by the World Wide Web Consortium (W3C) at [www.w3c.org](http://www.w3c.org).

### 2.1 Introduction to XML

XML is a worldwide standard designed to facilitate the format and transfer of data. XML can be readily imported into popular word processors, Internet browsers, and database software. Most database products can export XML files directly. XML viewers include the capability to validate an XML file. These benefits reduce the data transfer problems associated with invalid files and allow data suppliers to provide users with information in a format they can review using standard XML viewers.

A Luminaire Component Data file shall conform to the rules governing XML documents. This section provides a basic explanation of XML syntax. Note that XML is **case-sensitive**.

**2.1.1 XML Elements.** An XML document consists of one or more elements that identify the structure and content of the file.

An element consists of two named tags surrounding some content. The opening tag contains the element name between a less-than character (<) and a greater-than character (>). The closing tag is identical except for a forward slash character (/) preceding the element name (see the following *generic* example):

```
<ElementName>element content</ElementName>
```

In the next example, the actual element name is *Company* and the actual element content is *ABC Lighting*:

```
<Company>ABC Lighting</Company>
```

Some elements may be empty in which case they have no content. An empty element consists of one tag with the forward slash character (/) after the element name (see following):

```
<Company/>
```

**2.1.2 XML Element Hierarchy (Nested Elements).** The addition of an element within another element's content defines an explicit hierarchy. It is implied that this *child element* has the same attributes as its *parent element*. All XML examples are indented to indicate the hierarchy and improve readability. Indentation is not required to conform to the XML format.

In the following example, the file supplier's company name is defined using nested elements.

```
<File>
  <Supplier>
    <Company>ABC Lighting</Company>
  </Supplier>
</File>
```

The element hierarchy allows the data supplier to explicitly associate related information.

**2.1.3 XML Attributes.** The opening tag of an element can include attributes that define additional information. An attribute consists of a name and value pair separated by an equal sign (=). The attribute value must be contained inside either double or single quotation marks (see the following *generic* example):

```
<ElementName attribute="value">element content</ElementName>
```

In the next example, the actual attribute name is *units* and its actual value is *inches*:

```
<Diameter units="inches">10.8</Diameter>
```

**2.1.4 XML Declaration.** The first line of an XML file must be the XML declaration. The XML declaration explicitly identifies the file as an XML document and specifies the version of XML required to process the document. The XML declaration does not have a closing tag (see following):

```
<?xml version="1.0"?>
```

**2.1.5 XML Comments.** Comments can be placed anywhere in the file, except within element tags or before the XML declaration. Comments start with the characters <!-- and end with the characters --> (see following):

```
<!-- Manufacturer Comments -->
<Manufacturer>
  <Company>ABC Lighting</Company>
</Manufacturer>
```

---

### 3.0 REQUIREMENTS AND STRUCTURE FOR LUMINAIRE COMPONENT DATA FILES

---

LM-74 is intended to provide a consistent and readable approach to the creation of luminaire component data files.

#### 3.1 File Extension

The file extension for Luminaire Component Data files shall be. LCD (**L**uminaire **C**omponent **D**ata).

#### 3.2 File Structure

The material presented in this section will define the rules of the file structure and the inclusion of the Luminaire Component Data elements.

**3.2.1 Introduction.** Luminaire Component Data files conform to a basic hierarchical structure and contain certain fundamental elements. The element names for these fundamental elements are reserved and are shown in **Table 1**.

**3.2.2 Sample Luminaire Component Data File.** A sample Luminaire Component Data file containing general lamp information is presented in **Figure 1**.

**Figure 2** shows how a Luminaire Component Data file will be displayed in a typical Internet browser. Elements may be expanded or contracted as needed to view the data.

**3.2.3 Required Elements.** The first line of a Luminaire Component Data file shall be the XML declaration (see following):

```
<?xml version="1.0"?>
```

**Table 1: Names for the Fundamental Elements in a Luminaire Component Data File**

| Element Name                     | Description                                                                                                                                                                  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <File>...</File>                 | Information that pertains to the overall file.                                                                                                                               |
| <Manufacturer>...</Manufacturer> | Identifies the entity to which the component data applies.                                                                                                                   |
| <Lamp>...</Lamp>                 | A device consisting of a bulb, base and light producing elements.                                                                                                            |
| <Ballast>...</Ballast>           | An electrical component, including transformers, that provides the proper operating conditions for a lamp. (Reserved for future use)                                         |
| <Fixture>...</Fixture>           | The complete luminaire less the lamp(s), ballast(s) and photometric performance data. (Reserved for future use)                                                              |
| <Luminaire>...</Luminaire>       | A complete lighting assembly consisting of a fixture, lamp and ballast. (Reserved for future use)                                                                            |
| <Photometry>...</Photometry>     | The group of data that describes the photometric performance of a luminaire. (Reserved for future use)<br><br>Photometric data transfer is currently defined in IESNA-LM-63. |

```

<?xml version="1.0"?>
<IESNALM74 version="2005">
  <File>
    <Date>2005-03-14</Date>
    <Supplier>
      <Company>Zero Lumens Inc.</Company>
    </Supplier>
    <Manufacturer>
      <Company>ABC Lighting</Company>
      <Address>1992 Pearl Street</Address>
      <City>Boulder</City>
      <State>Colorado</State>
      <PostalCode>80302</PostalCode>
      <Email>TechnicalSupport@ABCLighting.com</Email>
      <Phone>555-555-1111</Phone>
    </Manufacturer>
  </File>
  <Lamp>
    <LampType>
      <Fluorescent>
        <Compact><Long/></Compact>
      </Fluorescent>
    </LampType>
    <Color>
      <Temperature units="kelvin">3500</Temperature>
    </Color>
    <Electrical>
      <Watts>80</Watts>
      <StartMethod>Rapid</StartMethod>
    </Electrical>
    <Physical>
      <Size units="inches">22.5</Size>
    </Physical>
  </Lamp>
</IESNALM74>

```

**Figure 1. A sample Luminaire Component Data File with the element content indicated in bold for clarity.**

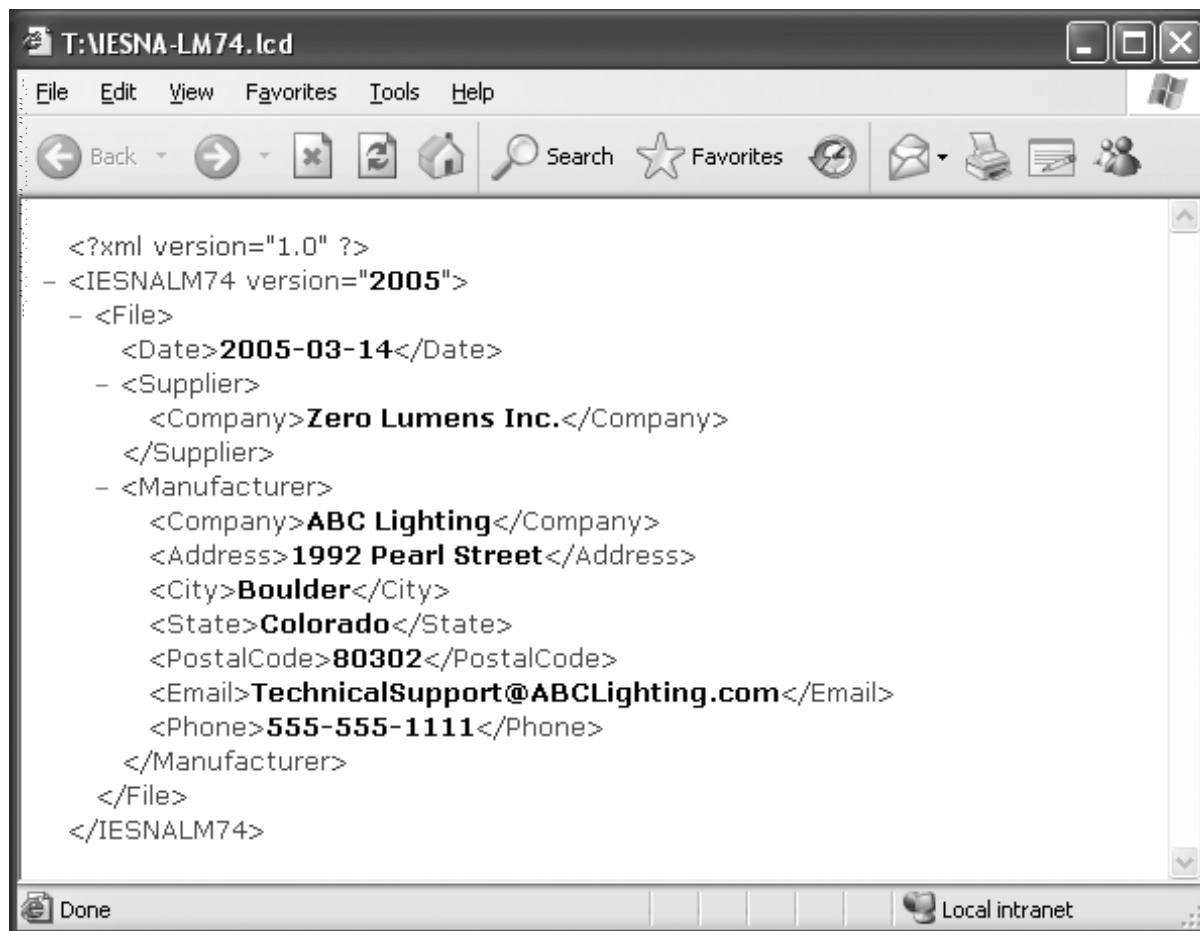


Figure 2. Browser view of a Luminaire Component Data file.

The root element shall be `<IESNALM74>`; all subsequent elements shall be contained within the root element. The `<IESNALM74>` element shall contain a version attribute having the value "2005" (see following):

```
<?xml version="1.0"?>
<IESNALM74 version="2005">
...
</IESNALM74>
```

The first element within the root element shall be the `<File>` element. The first element within the `<File>` element shall be a `<Date>` element, specifying when the file was created. The second element within the `<File>` element shall be a `<Supplier>` element, indicating the company that created the file. The `<Supplier>` element shall contain a `<Company>` element indicating the name of the company. The `<File>` element should also contain default file settings and any file information common to all elements (see following):

```
<?xml version="1.0"?>
<IESNALM74 version="2005">
  <File>
    <Date>2005-01-30</Date>
    <Supplier>
      <Company>Zero Lumens Inc.</Company>
    </Supplier>
    ...
  </File>
</IESNALM74>
```

The next element within the root element shall be a luminaire component element. In the following example, the luminaire component element is a <Lamp> element, which contains all related lamp information:

```
<?xml version="1.0"?>
<IESNALM74 version="2005">
  <File>
    ...
  </File>
  <Lamp>
    ...
  </Lamp>
</IESNALM74>
```

### 3.3 Element Names

The only element names allowed are those defined herein or developed as user defined element names.

**3.3.1 Rules for the Formation of Element Names.** Element names shall consist only of the characters represented by the following ASCII values:

| <u>Characters</u> | <u>ASCII Values</u> |
|-------------------|---------------------|
| 0 through 9       | 48 – 57             |
| A through Z       | 65 – 90             |
| a through z       | 97 – 122            |
| - (hyphen)        | 45                  |
| . (period)        | 46                  |
| _ (underscore)    | 95                  |

Element names shall not contain any non-printing characters, spaces, tabs, colons, or brackets.

Element names shall start with a letter or an underscore. The remainder of the element name can contain letters, numbers, hyphens, periods, and underscores. Element names may not begin with the characters *xml* in any variation of upper-case or lower-case (see following):

|                    |                                          |
|--------------------|------------------------------------------|
| <Company>          | <i>Valid</i>                             |
| <Postal Code>      | <i>Invalid: Includes a space</i>         |
| <123Street>        | <i>Invalid: Begins with a number</i>     |
| <email@server.com> | <i>Invalid: Includes the @ character</i> |
| <xmldata>          | <i>Invalid: Begins with xml</i>          |

Element names are case-sensitive: <company> and <Company> are considered two distinct elements. The required naming convention is for the first letter of each word comprising the element name to be uppercase and the remaining characters to be lowercase. Acronyms listed in **Annex A, Section A5.0** shall be all uppercase letters.

The following is an example of the proper luminaire component data element naming convention:

```
<PrimaryShippingAddress>...</PrimaryShippingAddress>
```

Element names should be as short as possible. Abbreviations shall not be used. Approved acronyms are allowed as listed in **Annex A, Section A5.0**. Commonly used terms shall be used wherever possible. Element names shall not be longer than 255 characters.

Adjectives should precede nouns in the element name (see following):

|                 |                        |
|-----------------|------------------------|
| <InitialLumens> | <i>Recommended</i>     |
| <LumensInitial> | <i>Not Recommended</i> |

**3.3.2 Notes Element.** The <Notes> element is used to include additional relevant information. A <Notes> element can be included in the <File> element and within any Luminaire Component Data element (see following):

```
<?xml version="1.0"?>
<IESNALM74 version="2005">
  <File>
    ...
    <Notes>This is additional information</Notes>
  </File>
  <Lamp>
    ...
    <Notes>This is additional information</Notes>
  </Lamp>
</IESNALM74>
```

**3.3.3 Repeated Instances of Elements.** Consecutive instances of an element may be used to provide additional information where required. The elements should be included in the order in which the file creator intends them to be read by the end user of the file (see following):

```
<Manufacturer>
  <Address>123 South Road</Address>
  <Address>Building #10 Suite 200</Address>
</Manufacturer>
```

Multiple luminaire component elements with the same name can be included in the file to identify distinct luminaire component instances. This provides the flexibility to specify several luminaire components in a single Luminaire Component Data file. **Figure 3** shows an example that defines two distinct lamp components.

```
<IESNALM74 version="2005">
  <!-- This Lamp element describes a distinct lamp. -->
  <Lamp>
    <Manufacturer>
      <Company>ABC Lamps</Company>
    </Manufacturer>
    <Electrical>
      <Watts>100</Watts>
    </Electrical>
    <LampType>
      <Incandescent><Standard/></Incandescent>
    </LampType>
  </Lamp>
  <!-- This Lamp element describes a second distinct lamp. -->
  <Lamp>
    <Manufacturer>
      <Company>ABC Lamps</Company>
    </Manufacturer>
    <Electrical>
      <Watts>100</Watts>
    </Electrical>
    <LampType>
      <Incandescent><Halogen/></Incandescent>
    </LampType>
  </Lamp>
</IESNALM74>
```

**Figure 3. Example of a Luminaire Component Data file that defines two distinct lamp components.**