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Light and lighting — ~~BIM Properties~~Building information modelling properties for lighting — Lighting ~~— Lighting Systems~~systems

~~*Licht und Beleuchtung — BIM Merkmale für die Beleuchtung — Beleuchtungssysteme*~~

~~*Lumière et éclairage — BIM Propriétés pour l'éclairage — Systèmes d'éclairage*~~

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 274, *Light and Lighting*~~, in cooperation with CIE Joint Technical Committee 6~~.

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Introduction

Building ~~Information Modelling~~information modelling (BIM) is a concurrent process that gives engineering and construction professionals the tools to more efficiently plan, construct, and manage buildings and infrastructure.

Within standardisation committees much work is being performed to define the fundamental principles of BIM that will allow this to happen in an effective and consistent manner.

For lighting applications, it is essential that this work is monitored and where required input is made to ensure that the requirements for lighting applications are considered.

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Light and lighting — Building information modelling properties for lighting — Lighting systems

1 Scope

This technical specification identifies and clarifies lighting properties for digital building design and maintenance.

This document provides all the needed properties to design and to describe lighting systems. These properties are intended to be used for mapping between data providers and requesters. The mapping of the identifiers enables the exchange of luminaire and sensing device data within different databases.

The unambiguous mapping and description of properties improves the data quality, reduces misinterpretations and the processing time in digital environments. Therefore, the properties listed in this document establish the essential description of lighting systems in BIM systems and databases.

The listed properties in this document are used to structure the product data sheet which is complemented with real product information.

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2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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ISO 23386:2020, *Building information modelling and other digital processes used in construction — Methodology to describe, author and maintain properties in interconnected data dictionaries*

CIE S 017:2020, *ILV: International Lighting Vocabulary*

ISO 80000-7, *Quantities and units — Part 7: Light*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in CIE S 017, ISO 80000-7 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
building information modelling
BIM
use of a shared digital representation of a built object (including buildings, bridges, roads, process plants, etc.) to facilitate design, construction and operation processes to form a reliable basis for decisions

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Note 1 to entry: The acronym BIM also stands for the shared digital representation of the physical and functional characteristics of any construction works.

[SOURCE: ISO 29481-1:2016, 3.2]

3.2
data dictionary
database that contains metadata

[SOURCE: ISO/IEC 2382:2015, 2121501]

3.3
attribute
data element for the computer-sensible description of a property, group of properties, etc.

Note 1 to entry: An attribute describes only one single detail of a property or a group of properties.

EXAMPLE The GUID of a property, the name of a property, the definition of a group of properties.

[SOURCE: ISO 23386:2020, 3.4, modified – Example extended]

3.4
property
inherent or acquired feature of an item

EXAMPLE Thermal efficiency, heat flow, sound reduction index, sound power level, colour.

[SOURCE: ISO 23386:2020, 3.17]

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4 Principal structure

4.1 General

A lighting system (for example a luminaire or a sensing device) consists out of properties which describes it and make it possible to communicate about it in application or specification.

The properties for lighting systems have been organized in tables listed in Clause 5 according to different disciplines. This sub-division is indicative only and not to be taken as exclusive:

— Mechanical properties – ID 01 (Table 1);

— Electrical properties – ID 02 (Table 2);

— Emergency lighting properties – ID 03 (Table 3);

— Photometric properties – ID 04 (Table 4);

— Sensing device properties – ID 05 (Table 5);

— Mounting & Accessory properties – ID 06 (Table 6);

— Marketing properties – ID 07 (Table 7);

— Operations & Maintenance properties – ID 08 (Table 8);

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— Environmental properties – ID 09 (Table 9).

4.2 Detailed description of set of attributes

4.2.1 General

The structure of the attributes is according to ISO 23386:2020 and enhanced by the property ID.

The properties have no mandatory or optional aspect. All properties are equal in importance and hierarchy. The use case and the application provide a structure and are mandatory to the properties.

4.2.2 GUID

In ISO 23386:2020 named “Globally unique identifier” (PA001).

Identifier given to a product that guarantees its uniqueness throughout its entire life. (defined in ISO 6707-2:2017, 3.2.46).

~~[SOURCE: ISO 6707-2:2017, 3.2.46]~~

This attribute identifies the property unambiguously. A Globally Unique identifier GUID is generated using an algorithm. This machine-readable code will allow matching across databases, lists and data template.

In IFC and ISO 12006-3 the compressed version of GUID is used. It can be uncompressed to the standard GUID with open tools.

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4.2.3 ID

This attribute identifies the property unambiguously. It is human-readable and corresponds to the globally unique identifier.

Note: The ID always starts with the table number from 4.1 followed by a dash and an individual serial number with four digits.

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4.2.4 Name

In ISO 23386:2020 named “Names in language en-EN” (PA016).

The name of the property.

4.2.5 Description

In ISO 23386:2020 named “Descriptions in language en-EN” (PA018).

This attribute is used to provide a plain language description of the property.

For some descriptions the name is enough. To avoid the repeating of the name, just “*identical with name.*” is entered.

4.2.6 Symbol

In ISO 23386:2020 named “Symbols of the property in a given property group” (PA022).

Symbols for quantities are given in the ISO 80000 and IEC 80000 series. The symbols for quantities are written in italics. A given symbol can indicate different quantities. [ISO 80000-1:2009].

4.2.7 Format, Unit

In ISO 23386:2020 named “Digital format” (PA037).

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Precision is the maximum number of significant digits that can be represented in a format, or the number of digits that a result is rounded to [ISO/IEC 60559:2020].

In ISO 23386:2020 named “Units” (PA033).

Concept type representing a scale that enables a value to be measured. Properties that do not have a unit are be designated as not applicable (n.a.).

4.2.8 Value set

In ISO 23386:2020 named “List of possible values in language en-EN” (PA039).

Collection of acceptable values for a property. Values outside the value set are not permitted. Multiple values may be possible for some properties.

4.2.9 Examples

In ISO 23386:2020 named “Examples in language en-EN” (PA019).

Samples for a value of the specific property.

4.3 Further IT-related attributes

Where potential attributes are not specified in 4.2, they may be defined separately within a data-dictionary. These attributes can be found in ISO 23386:2020:

— **Definitions in language en-EN (PA017):** A description of the attribute in order to define it unambiguously;

— **Method of measurement (PA029):** Evaluation of construction products to ensure their suitability according to requirements in harmonised technical specifications;

— **Name of the defining values (PA034):** In a table of values, this attribute provides the name of the column headers;

— **Data type (PA030):** Format for expressing the value of the property. This can be understood as the storage type from a software perspective. (ISO/IEC 11404 ~~subclause~~ :2007, 8.1) Examples: String, Float, Integer;

— **Status (PA002):** Status of the property during its life cycle. Example: Active;

— **Date of creation (PA003):** Date of validation of the property creation request. All dates in accordance with ISO 8601. Format=YYYY-MM-DDThh:mm:ssTZD. Example: 2014-04-30T10:39:53Z;

— **Date of activation (PA004):** Date after when the property can be used;

— **Date of last change (PA005):** Date of validation of the last change request;

— **Date of revision (PA006)**;

— **Date of version (PA007)**;

— **Date of deactivation (PA008):** Date when property becomes obsolete. The property is maintained in the dictionary;

— **Version number (PA009):** Enables tracking of major changes;

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— **Revision number (PA010):** Enables tracking of minor changes. If the version number changes, the revision number starts again at 1. Examples: new translation, changes of typos;

— **List of replaced properties (PA011):** Identifier of the replaced property (or properties). List of GUIDs;

— **List of replacing properties (PA012):** Identifier of the replacing property (or properties). List of GUIDs;

— **Deprecation ~~explaination~~explanation (PA013):** Reason of deprecation. Deprecated may indicate the property will be removed in the future. This ~~explaination has to~~explanation shall be written in international English (EN).

5 Properties for lighting systems

In ~~table~~ Table 1 the mechanical properties of a lighting system are described. This figure shows the orientation of a luminaire in the in the (C, γ) coordinate system from CIE 121:1996 to clarify the location relationship.

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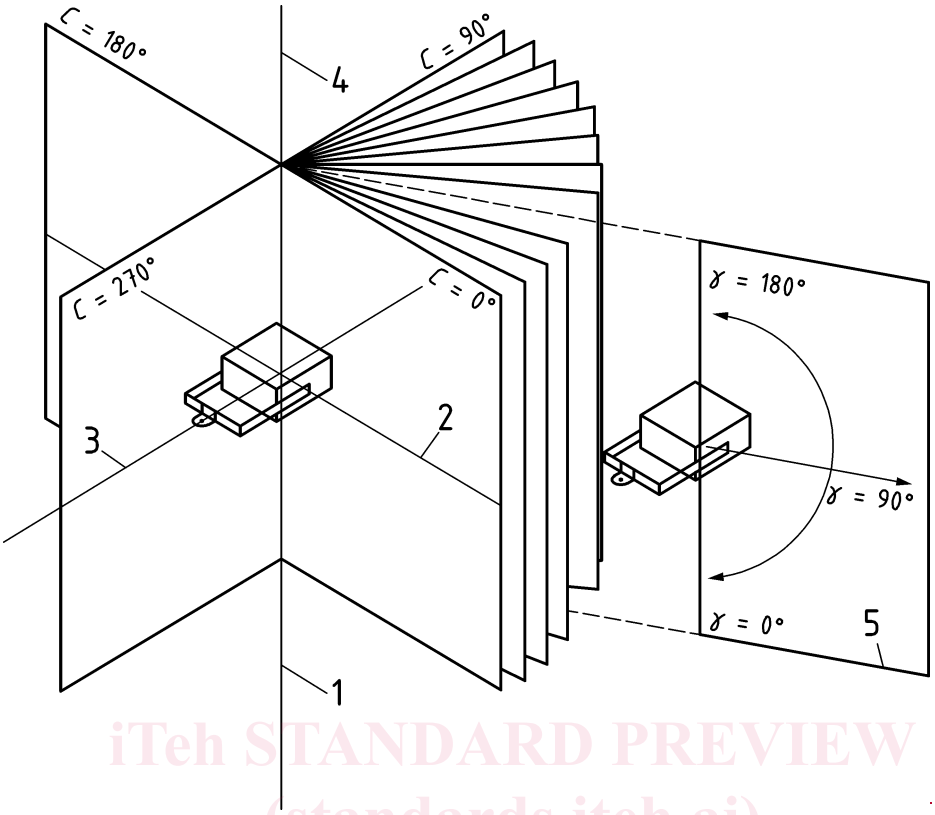

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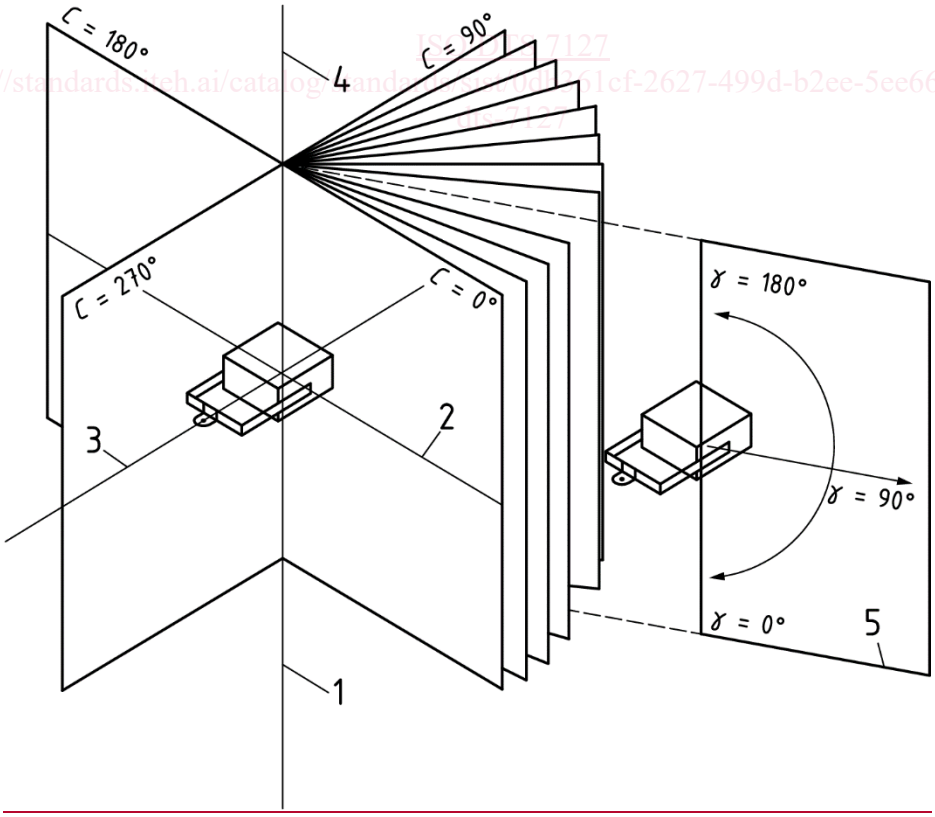

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Key

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~~1 First axis of luminaire~~

~~2 Second axis of luminaire~~

~~3 Third axis of luminaire~~

~~4 Polar axis of photometer~~

~~5 C half plane~~

1 first axis of luminaire
2 second axis of luminaire
3 third axis of luminaire
4 polar axis of photometer
5 C half plane

Figure 1 — Orientation of a luminaire in the (C, γ) coordinate system from CIE 121:1996~~,~~ ~~First~~; first axis of luminaire (γ) is in the IES LM-63-19, the ~~Vertical~~vertical or the z-axis~~,~~ ~~Second~~; second axis of luminaire (C0-C180) is in the IES LM-63-19, the 0° ~~Horizontal~~horizontal or the x-axis~~,~~ ~~Third~~; third axis of luminaire (C90-C270) is in the IES LM-63-19, the 90° ~~Horizontal~~horizontal or the y-axis

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