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International Commission on Illumination
Commission Internationale de l'Eclairage
Internationale Beleuchtungskommission

Draft International Standard

ILV: International Lighting Vocabulary

2nd Edition

Note

This document has been circulated to the CIE National Committees, CIE Divisions and CIE Board of Administration for comments.
It may not be referred to as a CIE International Standard until accepted by the CIE National Committees, CIE Divisions and CIE Board of Administration.

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Foreword

International Standards produced by the Commission Internationale de l'Eclairage are concise documents on aspects of light and lighting that require a unique definition. They are a primary source of internationally accepted and agreed data which can be taken, essentially unaltered, into universal standard systems.

This CIE Draft International Standard has been prepared by JTC 8 of the Commission Internationale de l'Eclairage. It includes definitions prepared by IEC/TC 34/MT 2. The cooperation with IEC/TC 34/MT 2 is acknowledged.

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Introduction

The aim of the International Lighting Vocabulary is to promote international standardization in the use of quantities, units, symbols and terminology related to the science and art of light and lighting, colour and vision, photobiology and image technology. This vocabulary provides the definitions and essential information necessary for the understanding and correct usage of the terms included. It does not give extensive detail or explanations of the application of these terms; such information, relevant for experts in each specialized field, is available in the Technical Reports and Standards produced by the CIE.

The first edition of the ILV was published in 1938, the latest in 2011. In 2015 CIE JTC 8 was established and received the task to address any issues regarding terms and definitions related to the International Lighting Vocabulary (ILV). This includes coordination within CIE Divisions to maintain and update the ILV, coordination with IEC on questions related to the incorporation of ILV terms and definitions into IEC 60050-845 “International Electrotechnical Vocabulary. Lighting”, coordination with ISO/TC 12 on questions related to the incorporation of ILV terms and definitions into ISO 80000-7 “Quantities and units – Part 7: Light and radiation”, and any further terminology issues within CIE.

This draft of a new edition of the International Lighting Vocabulary (ILV) is the result of intensive work carried out by CIE JTC 8 in order to harmonize the content of the ILV in its version of 2011 (published as CIE S 017:2011) with the content of the International Electrotechnical Vocabulary (IEV), subject area “Lighting” (IEC 60050-845), considering the rules for drafting definitions as given in the ISO/IEC Directives. In addition parallel work in ISO/TC 12/WG 19 (Revision ISO 80000, all parts) was considered in the harmonization process.

In the course of the JTC 8 work the complete ILV was reviewed. This review was necessary due to inadequacies in the 2011 version in terms of not IEC/ISO-compatible formatting, but also in terms of deficiencies in the definitions. For the review work the document in its current form (published as CIE S 017:2011) was split into eight parts (related to the topics of the seven CIE Divisions and IEC). IEC/TC 34/MT 2 reviewed entries belonging to Sections 7, 8 and 10 (and partly Section 11) of the IEV, whereas the other entries were reviewed by the divisional representatives in JTC 8 of CIE.

After finalization of this work, the eight parts were merged again, considering a revised numbering system. The ILV is now back to section-wise assignment as this is the requirement of IEC (to include the ILV terms and definitions in the IEV) and as this has been proven as more reasonable than an alphabetical order (which only works for one language).

The new entry numbers have been created as follows:

- The section titles of the current IEV have been left as they are, an additional section was created for “Imaging”.
- In agreement with IEC the section numbers of the current IEV (845-01 through 845-11) have been replaced by new numbers, adding 20 to each of the section numbers, so that the sections in the IEV will now have the numbers “845-21” through “845-32”. For the ILV (this document) the number for the IEV subject area “845” has been replaced by the number of the CIE Standard (“17”). (See also Table 1.)
- All entries have been assigned to one of these sections, considering existing assignments of entries that had already been present in the current version of the IEV. Anyhow, as entries have been re-sorted considering similar subject fields within one section, the entry numbers have changed in most cases compared to those in the current IEV.
- Entries are sorted accordingly by sections and within the sections by their term numbers.
- The new term numbers (17-ss-nnn) are accompanied by the current ILV number (if available) and the current IEV number (if available) on the same line for retraceability reasons. If an entry is new, i.e. it is not in the 2011 ILV version and thus no current ILV number is available, this is indicated by “NEW”. If no IEV number is available, i.e. the term is not in the current IEV, this is indicated by “---“.
- The terms in Sections 7, 8 and 10 received the numbers as assigned in the IEC document 34/326/CD, prepared by IEC/TC 34/MT 2, with the adjustment of the subject area and

section number (e.g. 845-07-xxx became 17-27-xxx). Note that these numbers are still subject to change.

Table 1 – Numbering of IEV/ILV sections

IEV 1987 Section	New IEV Section	New ILV Section	Title	Leader
845-01	845-21	17-21	Radiation, quantities and units	CIE
845-02	845-22	17-22	Vision, colour rendering	CIE
845-03	845-23	17-23	Colorimetry	CIE
845-04	845-24	17-24	Emission, optical properties of materials	CIE
845-05	845-25	17-25	Radiometric, photometric and colorimetric measurements: physical detectors	CIE
845-06	845-26	17-26	Actinic effects of optical radiation	CIE
845-07	845-27	17-27	Light sources	IEC/CIE
845-08	845-28	17-28	Components of lamps and auxiliary apparatus	IEC
845-09	845-29	17-29	Lighting technology, day lighting	CIE
845-10	845-30	17-30	Luminaires and their components	IEC/CIE
845-11	845-31	17-31	Visual signalling	CIE/IEC
	845-32	17-32	Imaging	CIE

In addition to the renumbering of the entries the following formal changes were taken care of:

- All terms and synonyms relating to one concept are now in the same entry. Thus synonyms and abbreviations have been transferred to the entry of the preferred term and are not listed as separate entries anymore. The according entries for synonyms (called “Equivalent terms” in CIE S 017:2011) and abbreviations have been deleted.
- Deprecated term(s) are now placed on a new line below the term name (and synonym(s), if any) and are identified by the text "DEPRECATED:".
- The indication of the national variant “US” for synonyms was deleted in the CIE-responsible part because the relevant terms are not only used in the US (though they may have their origin there). The entries under IEC responsibility still use the indication of “US” in some cases. This is still under discussion.
  Note that generally the preferred term shall be used in CIE publications.
- Grammatical information for terms that are not nouns or for terms that are used in their plural form was added, e.g. “**bright**, adj”, “**cones**, pl”.
- Parentheses are not used anymore to show alternative terms. If parentheses had been used to indicate more than one alternative for the presentation of a term, this is now indicated by synonyms.
- If a term is used to represent several concepts, the specific use or subject to which each concept belongs is indicated between angle brackets, e.g. “**colour difference**, <psychophysical>". Each concept received a separate entry.
- Symbols have been transferred to a dedicated field. They are not presented in square brackets on the same line as the term anymore.
- NOTES have been renamed “Note X to entry” or in case where they represent an example “EXAMPLE”.
- Units are now specified in a note to entry.

The following deletions of entries have been performed:

- Entries that were transferred as synonyms to other entries (including abbreviations)
- Entries that were not explicitly related to light and lighting (e.g. road-related terms)
- Entries with definitions of acronyms for organizations, e.g. CIE and PIARC

The following entries have been added to this draft:

- Terms and definitions that had been under discussion in CIE TC 1-64
- Terms and definitions of CIE S 017-SP1
- Terms and definitions that have been agreed in ISO/TC 274
- Terms and definitions of CIE TN 002
- Entries which proved to be reasonable during revision work

For entries adopted from CIE S 017-SP1:2015, IEC 34/326/CD (not publicly available) and ISO/TC 274, N176 (not publicly available) the respective source is indicated below the entry.

Though every effort has been made to harmonize definitions, there are still a few remaining discrepancies between definitions that have been agreed in CIE and definitions for the same term that have been agreed in IEC. Where this is the case the CIE definition is accompanied by the respective IEC definition, presented within a frame.

ILV: International Lighting Vocabulary

1 Scope

This Standard defines terms regarding all matters relating to light and lighting, colour and vision, photobiology and image technology.

2 Normative References

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3 Terms and definitions

Section 21: Radiation, quantities and units

17-21-001 17-370 845-01-01
electromagnetic radiation
emission or transfer of energy in the form of electromagnetic waves with the associated photons

17-21-002 17-848 845-01-02
optical radiation
electromagnetic radiation at wavelengths between the region of transition to X-rays ($\lambda \approx 1$ nm) and the region of transition to radio waves ($\lambda \approx 1$ mm)

17-21-003 17-1402 845-01-03
visible radiation
any optical radiation capable of causing a visual sensation directly

Note 1 to entry: There are no precise limits for the spectral range of visible radiation since they depend upon the amount of radiant flux reaching the retina and the responsivity of the observer. The lower limit is generally taken between 360 nm and 400 nm and the upper limit between 760 nm and 830 nm.

17-21-004 17-580/610 845-01-04
infrared radiation
IR radiation
optical radiation for which the wavelengths are longer than those for visible radiation, from 780 nm to 1 mm

Note 1 to entry: For infrared radiation, the range between 780 nm and 1 mm is commonly subdivided into:
IR-A: 780 nm to 1 400 nm, or 0,78 μm to 1,4 μm;
IR-B: 1,4 μm to 3,0 μm;
IR-C: 3 μm to 1 mm.

Note 2 to entry: A precise border between “visible” and “infrared” cannot be defined because visual sensation at wavelengths greater than 780 nm can be experienced.

Note 3 to entry: In some applications the infrared spectrum has also been divided into “near,” “middle,” and “far” infrared; however, the borders necessarily vary with the application.

17-21-005 17-605 ---
IR-A
infrared radiation covering the range from 780 nm to 1 400 nm (1,4 μm)

17-21-006 17-606 ---
IR-B
infrared radiation covering the range from 1,4 μm to 3,0 μm

17-21-007 17-607 ---
IR-C
infrared radiation covering the range from 3 μm to 1 mm

