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INTERNATIONAL STANDARD

colour inside

Display lighting unit –
Part 1-2: Terminology and letter symbols

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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DISPLAY LIGHTING UNIT –

Part 1-2: Terminology and letter symbols

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International Standard IEC 62595-1-2 has been prepared by IEC technical committee 110: Electronic display devices.

This second edition cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) change in the series title in order to handle frontlight units;
b) new terms are added considering recent advances in display lighting unit (DLU) technology;
c) some of terms and definitions are corrected and revised, particularly to be consistent with IEC 62595-2;
d) some of the terms and definitions are corrected and revised, particularly to be consistent with IEC 60050 policy;

e) clause structure is rectified for categorizing terms correctly;

f) some of figures in Annex A are added or revised for better understanding.

The text of this standard is based on the following documents:

FDIS	Report on voting
110/720/FDIS	110/734/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62595 series, under the general title *Display lighting unit*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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DISPLAY LIGHTING UNIT –

Part 1-2: Terminology and letter symbols

1 Scope

This part of IEC 62595 gives the preferred terms, their definitions and symbols for display lighting units (DLUs) such as backlight units (BLUs) of transmissive and transflective LCDs, and frontlight units (FLUs) of reflective LCDs and electronic paper (E-paper) displays, with the object of using the same terminology when publications are prepared in different countries.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-845, *International Electrotechnical Vocabulary – Part 845: Lighting*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845[1] as well as the following apply.

3.1 Classification of terms

Terms for display lighting units (DLUs), such as backlight units (BLUs) and frontlight units (FLUs) are classified as follows:

a) fundamental terms related to display lighting units (3.2);
b) terms related to passive optical components used in display lighting units (3.3);
c) terms related to solid-state light sources used in display lighting units (3.4);
d) terms related particularly to frontlight units (3.5);
e) terms related to performances and specifications (3.6);
f) terms related to backlight dimming (3.7).

The following definitions are applied for international standardization of the backlight units.

3.2 Fundamental terms

3.2.1
display lighting unit
DLU
lighting unit for recognition of the displayed images on a non-emissive electronic display device

1 Identical to CIE 17.4.

3.2.2
backlight unit
BLU
display lighting unit that is set at the rear of a non-emissive electronic display device such as a transmissive or transflective liquid crystal (LC) device

Note 1 to entry: For an example, see Figure A.1.

3.2.3
edge-lit backlight unit
side-lit backlight unit
edge-light backlight unit
side-light backlight unit
backlight unit in which an optically transparent medium (typically light-guide plate) is used in proximity with the light source(s) for introducing the light into the medium from one or several sides of the medium to illuminate an LC device

Note 1 to entry: For an example, see Figure A.2.

3.2.4
direct-lit backlight unit
direct-view backlight unit
backlight unit in which a light chamber is used in combination with light source(s) that are mounted inside the chamber, for illuminating a transmissive LC device mounted on the light chamber for the purpose of image recognition

Note 1 to entry: For an example, see Figure A.3.

3.2.5
side-driven direct-lit backlight unit
backlight unit in which a light chamber is used in combination with light sources(s) that are mounted on the inner sides of the light chamber for illuminating a panel mounted on the light chamber for the purpose of image recognition

3.2.6
static backlight unit
single or integrated flat illumination system that operates with direct or alternative current and possesses a unique optical characteristic

3.2.7
dynamic backlight unit
single or integrated illumination units that possess a unique electro-optical characteristic which is synchronized with the local picture and its contents displayed on an LC device

3.2.8
blinking backlight unit
backlight unit that is periodically switched on and off for synchronically illuminating an LC device

3.2.9
scanning backlight unit
backlight unit that is divided optically or spatially into several line blocks and is periodically switched on and off, block by block, for synchronous illumination of an LC device

3.2.10
directional backlight unit
D-BLU
backlight unit that collimates emergent light into an arbitrary solid angle or directs the collimated emergent light toward a spatial zone or surface on the back side of the LC device

3.2.11
multi-directional backlight unit
backlight unit in which the light sources (LEDs or LDs) are spatially mounted in an array around a micro- or submicro-featured (structured) light-guide plate (LGP) or light-guide film (LGF), for sequentially switching to create spatially and/or angularly directed light for rendering a 3D image on the LC device

Note 1 to entry: LED and LD are defined later.

3.2.12
scanning directional backlight unit
scanning D-BLU
D-BLU that illuminates continuously or distinctively a wide solid angle and/or an area in front of the backlight unit, i.e. the backside of the LC device, by consecutively switching (on and off) the spatially distributed light source array on the side surfaces of the light-guide plate (LGP)

3.2.13
spatio-temporal switching backlight unit
backlight unit that is divided optically or spatially into several horizontal blocks and periodically switched on and off from top to bottom under a time table for illuminating or flashing red, green, or blue light in synchronization with a field-sequential colour LC device with or without micro colour filters

3.2.14
field alternate LCD backlight unit
top and bottom flashing
backlight unit that includes a single light-guide plate (single or spatially divided into top and bottom) with distinctive upper and lower light source groups for illuminating an LC device in which an image is divided into top and bottom parts that are displayed alternately on the LC device in order to compensate the slow response time of the LC device

3.2.15
field alternate LCD backlight unit
left and right alternate flashing
backlight unit that includes a single light-guide plate (LGP) or stacked LGPs for illuminating an LC device in which an image is divided into a left and right image in which the two images are oriented in different directions and where the left and right images are displayed alternately on the LC device in order to create a 3D image display

3.2.16
single-side light emission backlight unit
backlight unit that emits light from a front surface or rear surface (i.e. from a single side) for illuminating a single LC device

3.2.17
double-sides light emission backlight unit
backlight unit that emits light from both the front and the rear surface for illuminating two LC devices

3.2.18
segmented backlight unit
backlight unit that is divided into blocks or segments in two dimensions for synchronization with an LC device for illuminating individually each block or segment of the LC device

3.2.19
quasi-monochromatic backlight unit
backlight unit that uses a single quasi-monochromatic light source for illuminating a transmissive LC device

3.2.20
multi-colour backlight unit
backlight unit that consists of multiple primaries or multiple quasi-monochromatic light sources for illuminating an LC device for displaying a wide colour gamut that is used for a printer, professional design monitor or field alternative wide colour gamut LC device

3.2.21
portability enhanced backlight unit
backlight unit the optical components of which are thin and lightweight to enhance portability

3.2.22
corner driven backlight unit
edge-lit backlight unit in which the light is driven from one or several flattened corners of a rectangular light-guide plate using single or multiple light sources

3.2.23
stack backlight unit
backlight unit in which more than one single light control medium or light-guide plate is used in stack form in the structure for light direction controlling or light shaping

3.2.24
colour reproduction backlight unit
backlight unit that uses light sources of three or more primaries in order to produce a wide colour gamut on an LC device

3.2.25
light-emitting diode backlight unit
LED backlight unit
backlight unit that uses LEDs as light sources

3.2.26
laser backlight unit
backlight unit that uses laser(s) as light source(s)

3.2.27
laser diode backlight unit
LD backlight unit
laser backlight unit that uses LD(s) as light source(s)

3.2.28
RG-white backlight unit
backlight unit that uses light sources such as LEDs or LDs that emit light of red, green and white (i.e. RG-white) colours

3.2.29
RGW backlight unit
backlight unit that uses distinct red, green and pseudo-white LEDs or LDs as light sources

3.2.30
three primaries (R,G,B) backlight unit
backlight unit that uses three primary colours of red, green, and blue quasi-monochromatic LEDs or monochromatic LDs as light sources

3.2.31
six primaries (R_1,G_1,B_1,R_2,G_2,B_2) backlight unit
backlight unit employing two groups of red, green and blue light sources for illuminating an LC device which is used for reproduction of colours of photographs

3.2.32
single-flash backlight unit
backlight unit that flashes periodically and is synchronized with an LC device for the purpose of inserting a black or grey frame in order to enhance the moving image quality on the display

3.2.33
multi-flash backlight unit
spatially linear segmented backlight unit for scanning or field-sequential colour display that flashes periodically and is synchronized with the LC device for the purpose of inserting colour fields (displayed image with single colour) or black or grey fields in order to enhance the displayed image quality on the display or spatially mix the colours for displaying coloured images

3.2.34
multi-primary colours backlight unit
backlight unit that employs multiple LEDs or LDs which have different peak wavelengths of primaries

3.2.35
tandem backlight unit
backlight unit that is an integration of multiple distinct and overlapped edge-lit backlight units

3.2.36
quantum dot backlight unit
QD backlight unit
edge-lit or direct-lit backlight unit in which blue light source(s) such as LEDs or LDs stimulate the film set on the backlight unit or a glass tube filled with quantum dot materials to create white light with three primaries spectra on the backlight unit

3.3 Terms related to passive optical components

3.3.1
light-guide plate
LGP
optically transparent medium with thick and solid structure that is generally employed in an edge-lit backlight unit for forming the required light distribution spatially for transmissive or transflective LC devices

Note 1 to entry: For an example, see Figure A.4.

3.3.2
light-guide film
LGF
optically transparent medium with thin and flexible structure that is employed instead of light-guide plate (LGP) in an edge-lit backlight unit for forming the required light distribution spatially for a transmissive or transflective LC device

3.3.3
functional light-guide plate
functional light-guide film
optically transparent medium characterized by optical micro- or submicro-structures for shaping spatially or angularly the required light distribution in an edge-lit backlight unit for illuminating a transmissive or transflective LC device

3.3.4
slab light-guide plate
slab light-guide film
light-guide plate or light-guide film that has a slab geometrical shape

3.3.5
wedge light-guide plate
wedge light-guide film
light-guide plate or light-guide film with a wedge shape (single or double wedge) introducing the light from the thicker side

3.3.6
inverted wedge light-guide plate
inverted wedge light-guide film
light-guide plate or light-guide film with a single or double wedge in which the light is introduced from the thinner side

3.3.7
double-side functional light-guide plate
double-side functional light-guide film
light-guide plate or light-guide film structured with micro- or submicro-structure(s) on the rear and front surfaces for light shaping on the backlight unit

3.3.8
single-side functional light-guide plate
single-side functional light-guide film
light-guide plate or light-guide film structured with light reflecting micro-reflectors or light deflecting micro-deflectors arrays on the rear or front surface for shaping and extracting the propagating light

3.3.9
diffusing light-guide plate
diffusing light-guide film
light-guide plate or light-guide film structured with light diffusing micro-structures on its rear and front or both surfaces for light shaping or the resin of which is filled with diffusing materials such as beads

3.3.10
reflective light-guide plate
reflective light-guide film
light-guide plate or light-guide film structured with optical micro-reflectors on the rear surface for extracting light from the front surface

3.3.11
deflective light-guide plate
deflective light-guide film
light-guide plate or light-guide film structured with optical micro-deflective elements on the front surface for the purpose of deflecting the emergent light rays from the front surface of the light-guide plate or light-guide film

3.3.12
dispersive light-guide plate
dispersive light-guide film
light-guide plate or light-guide film structured with micro-optical elements for dispersing the emergent light on the light-guide plate or light-guide film

3.3.13
polarizing light-guide plate
polarizing light-guide film
light-guide plate or film with micro- or submicro-structures for generating polarized light on its front surface

3.3.14
diffuser film
optical film that functions as light-diffusing component in the backlight unit structure

Note 1 to entry: For an example, see Figure A.4.

3.3.15
prism film
optical film that possesses discrete prism lines or continuous prism lines with triangular prismatic cross-section structures for collimating or deflecting (on its surface) the rays that are incident on the rear surface of the film

3.3.16
circular prism film
film that possesses a geometrically circular prism structure with a triangular prismatic cross section for collimating and deflecting azimuthally the incident light rays striking the prism's inner surfaces

3.3.17
luminance enhancing film
brightness enhancing film
light-collimating film in which the incident light on its rear surface is collimated on its front surface resulting in luminance or brightness enhancement

Note 1 to entry: For an example, see Figure A.4.

3.3.18
inverted prism film
optical film with an array of line prisms in which the tips of the prisms are directed towards the light-guide plate in a backlight unit structure

3.3.19
total-internal-reflection film
TIR film
optical film (such as an inverted prism film) that has a light-ray deflecting function based on the total internal reflection

3.3.20
reflector film
film for reflecting back the light that emerges from the surfaces next to the front surface of the light-guide plate or light-guide film

3.3.21
light-collimating film
optical film that collimates light incident on its rear surface on its front surface

3.3.22
quantum dot film
QD film
film that sandwiches the quantum dot layer to be used on the backlight unit and stimulated by blue emission light sources such as LEDs or LDs

3.3.23
micro-deflector element
optical micro-structure with light ray deflection function structured on the front or rear surface of a functional light-guide plate or light-guide film

3.3.24
micro-reflector element
submicro-reflector element
optical micro- or submicro-structure with light ray reflection function structured on the front or rear or both surfaces of the functional light-guide plate or light-guide film

3.3.25
micro-diffusive element
submicro-diffusive element
optical micro- or submicro-structure with a light ray dispersing function structured on the front or rear or both surfaces of the functional light-guide plate or light-guide film

3.3.26
specular light reflector film
light reflector film coated with metal (such as silver, aluminium) or structured with multiple optical layers for reflecting incident light without diffusion of the incident light

3.3.27
partially specular light reflector
reflector film with specular reflection characteristic and partially light diffusing characteristic

3.3.28
light-diffusing reflector
optical film that diffuses the incident light and generates a homogeneous or non-homogeneous light distribution

3.3.29
light-source reflector
piece of metal or paper with a highly reflective surface that is used for introducing or re-reflecting light that travels in other directions rather than towards the light control medium in a backlight unit

3.3.30
light-guide reflector
piece of metal or paper with a highly reflective surface that is used on the rear or side surfaces of a light-guide plate or light-guide film for reflecting back the light emerging from the rear surface or side surfaces of the light guide-plate or light-guide film

3.3.31
light cone
solid angle into which the light radiates from the front surface of a backlight unit or light-guide plate

3.3.32
block
<backlight unit> segment of a backlight unit which is divided two-dimensionally for synchronization with an LC device for the purpose of local dimming

3.3.33
partition
<backlight unit> piece of metal, coated paper or light diffusing reflector for optically isolating the segments of a one- or two-dimensionally divided backlight unit

3.3.34
addressed block
segment of spatially divided backlight unit for local dimming that cooperates with the locally addressed LC device for improving image quality and power saving

3.3.35
flashing block
segment of a spatially divided backlight unit that flashes in response to written data of a local segment of an LC device

3.3.36
backlight cavity
light-controlling cavity structured by optical micro- or submicro-features or surrounded by optically micro- or submicro-structured films for directing light toward the rear of an LC device

3.3.37
light chamber
light box the inner side of which is optically characterized for light shaping and extracting and used in a direct-lit backlight unit

3.3.38
bezel
<backlight unit> geometrically shaped metal or non-metal front frame for mechanically fixing together an LC device and a backlight unit

Note 1 to entry: For an example, see Figure A.4.

3.3.39
case
<backlight unit> housing of the backlight unit

Note 1 to entry: For an example, see Figure A.4.

3.3.40
flexible printed circuit
FPC
<backlight unit> piece of flexible material (such as polyimide) that has a printed circuit on its surface for driving electrically the light sources and complementary electrical devices in a backlight unit

Note 1 to entry: For an example, see Figure A.4.

3.3.41
metal core printed circuit board
MCPCB
<backlight unit> solid metal board on which an electric circuit has been printed for mounting solid-state light sources and for use as a heat sink in the backlight unit structure

Note 1 to entry: For an example, see Figure A.4.

3.4 Terms related to solid-state light sources

3.4.1 Light-emitting diode (LED)

3.4.1.1
pseudo-white LED
solid-state light source that has an LED die (chip) emitting blue light and typically YAG (yttrium aluminium garnet) phosphor for converting a part of the blue light into yellow colour for generating white light based on complementary colour mixing

3.4.1.2
RGB LED
combination of solid-state quasi-monochromatic light sources with primary colours

Note 1 to entry: RGB LED can also be defined as a set of LED dies (chips) with quasi-monochromatic light of primaries that are packed together to mix additively and obtain a white light at a predefined point

3.4.1.3
ultra-violet stimulated white LED
UV-white LED
solid-state light source with an LED die (chip) emitting light in the ultraviolet wavelength range of ultra violet that stimulates a combination of blue, green and red phosphors to create light having white colour

3.4.1.4
near UV stimulated white LED
NUV-white LED
solid-state white light source with an LED die (chip) emitting light in the near ultraviolet wavelength range (e.g. 380 nm to 410 nm) and a combination of blue, green and red phosphors that are stimulated by the light of the LED die

3.4.1.5
RG-white LED
solid-state white light source with an LED die (chip) emitting blue light that stimulates red (R) and green (G) phosphors which are added to the cavity of the LED package

3.4.1.6
quasi-monochromatic LED
LED die emitting light at a dominant wavelength and possessing a bandwidth

3.4.2 LED light bar

3.4.2.1
LED light bar
strip light source in which multiple LEDs are mounted along the length of the strip to create a linearly uniform distribution of illuminance in the backlight unit

Note 1 to entry: For an example, see Figure A.4.

3.4.2.2
side-view light bar
light bar that employs LEDs with a side-fire radiation pattern

3.4.2.3
top-view light bar
light bar that employs LEDs with a top-fire radiation pattern

3.4.2.4
bulk-coupling light bar
light bar that employs omni-directional LEDs in which the light from the LEDs is coupled into the body of the light-guide plate or light-guide film

3.4.2.5
omni-directional light source bar
light bar that employs LEDs with an omni-directional radiation pattern

3.4.2.6
uniformly coloured light bar
light bar that has a uniform chromaticity

3.4.2.7
light bar tolerance
predefined tolerance in the illuminance of the light bar at a predefined distance from the light bar

3.4.2.8
light bar spatial luminance distribution
spatial luminance distribution on the light bar or at a pre-defined direction and distance from the light bar

3.4.2.9
light bar angular luminance distribution
angular luminance distribution around the light bar in a pre-defined direction and angle which are defined in the polar coordinate system

3.4.2.10
quantum dot tube
QD tube
quantum dot bar
QD bar
glass tube or bar with quantum dots that is used in front of an array of blue LED(s) as stimulation source to generate a white light

3.4.2.11
quantum dot tube spatial luminance distribution
quantum dot bar spatial luminance distribution
spatial luminance distribution of a stimulated quantum dot tube or quantum dot bar defined at a distance in front of the quantum dot tube or bar

3.4.2.12
quantum dot tube spatial luminance uniformity
quantum dot bar spatial luminance uniformity
spatial luminance uniformity of a quantum dot tube or quantum dot bar stimulated by blue-light-emitting LED(s) or LD(s)

3.4.2.13
quantum dot tube angular luminance distribution
quantum dot bar angular luminance distribution
angular luminance distribution of blue-light-stimulated quantum dot tube (or quantum dot bar) along the tube (or bar) or perpendicular to the tube (or bar) when stimulated by an array of blue LED(s) or LD(s)

3.5 Terms related to frontlight units

3.5.1
frontlight unit
FLU
display lighting unit that is set on the front side of non-emissive electronic display devices such as a reflective or transflective (partially transmissive or partially reflective) LC device or electronic paper display

3.5.2
prismatic light-guide plate
prismatic light-guide film
transparent optical medium for direction controlling and shaping the light by the prismatic micro-structures that are fabricated on the front or rear or both the surfaces of the medium

3.5.3
two-surface micro-prism reflector
unilateral or bilateral microprism with two light-reflecting surfaces usually fabricated on the light-guide plate or light-guide film or stick light

3.5.4
three-surface micro-prism reflector
micro-prismatic structure with three light reflecting surfaces fabricated on light collimating light-guide plate or light-guide film or stick light

3.5.5
stick light
stick lightguide
straight and slender lightguide (transparent optical medium with any geometrical cross-section) with an array of micro-structures for transforming a point source into a uniform line source to be used in a backlight unit or a frontlight unit

3.5.6
stick light reflector
stick light-guide reflector
piece of metal or paper with a highly reflecting surface for covering the longitudinal sides (beside the light emerging surface) of the stick light

3.5.7
stick light directivity
stick light-guide directivity
angular luminance distribution of a stick light used in a backlight unit or a frontlight unit

3.5.8
anti-reflection coating
single or multi coating (on the light-guide plate or light-guide film of a frontlight unit) for reducing undesired reflected light that results in the apparition of ghost images when the frontlight unit is integrated to the reflective display

3.5.9
ghost image
result of undesired reflected light in the prismatic light-guide plate or light-guide film used in a frontlight unit

3.6 Terms related to performances and specifications

3.6.1
luminance uniformity
spatial luminance distribution
distribution of luminance measured at predefined point(s) on the display lighting unit

Note 1 to entry: For an example, see Figure A.5.

3.6.2
luminance evaluation point
infinitesimal area on a display lighting unit that is measured and used for evaluation of the luminance and luminance uniformity, usually defined as a 25-point measurement

3.6.3
angular luminance distribution
luminance distribution of an illuminating flat area or display lighting unit that is measured at zenith angles of 0° to 90° and azimuthal angles of 0° to 360°

Note 1 to entry: For an example, see the polar coordinates shown in Figure A.6.

3.6.4
angular luminance variation
variation of luminance with zenith (θ) or azimuth (φ) angles on the illuminating surface of a display lighting unit, that is, L_v (θ, φ, x_i, y_i, z_i), where the coordinates of an arbitrary point are at (x_i, y_i, z_i) on the backlight unit and (θ, φ) are the light cone extends with respect to the centre axis deviated from the surface normal of the display lighting unit

Note 1 to entry: For an example, see Figure A.7.

3.6.5
angular luminance uniformity
angular luminance variation of a point on a display lighting unit with zenith angle (θ)

3.6.6
colour definition point
point for defining chromaticity on a display lighting unit with pseudo-white light sources or distinct different monochromatic light sources

3.6.7
colour uniformity
variation of colour on a display lighting unit that is defined using a chromaticity difference between the predefined points

3.6.8
colour mixing
colour additive process in a display lighting unit for obtaining white colour at a predefined point

3.6.9
colour mixing area
area for mixing additively different colours from quasi-monochromatic light sources in a display lighting unit in order to obtain a white point at a predefined point

3.6.10
angular colour uniformity
uniformity of colour in a luminance distribution of a point on a display lighting unit, measured along the polar angle (zenith angle)

3.6.11
spectral dependence of angular luminance distribution
angular luminance distribution of a point on a display lighting unit in which spectral radiation changes with polar (zenith) angle

3.6.12
colour shift
change in colour on a predefined point on the display lighting unit

3.6.13
backlight gamma characteristic
fidelity response characteristic of a spatially block-wise backlight unit to the spatial frequencies of the display image frame

3.6.14
optical signal-to-noise ratio
optical S/N ratio
<display lighting unit> ratio of desired luminance to un-desired luminance in pre-defined zenith and azimuth angles

3.6.15
ageing time
<display lighting unit> period of time necessary to stabilize the output luminance of a display lighting unit

3.6.16
spectral power distribution
$S_{DLU}(\lambda)$
<display lighting unit> power spectrum per unit area, measured using a spectrometer or an optical spectrum analyser as the spectrum of light emerging from a unit area on a display lighting unit

Note 1 to entry: For an example, see Figure A.8.

3.6.17
incoherent light spread function
I-LSF
<backlight unit> three-dimensional or two-dimensional spatial luminance profile of a single circularly symmetric infinitesimal point or block (having x-axis or y-axis symmetry) in a block-wise backlight unit illuminated by one or more incoherent light sources such as an LED or diffused light of an LD

3.6.18
block-wise incoherent light spread function
<backlight unit> luminance profile of a block of a block-wise backlight unit illuminated by one or more incoherent light source(s) such as an LED or the diffused light of an LD

Note 1 to entry: For an example, see Figure A.9 and Figure A.10.

3.6.19
incoherent line spread function
<backlight unit> luminance profile of a linear block of a block-wise backlight unit illuminated by an incoherent line light source, such as an LED or the diffused light of an LD line array

3.6.20
incoherent modulation transfer function
I-MTF
light transfer function
LTF
<backlight unit> spatial frequency response of a backlight unit of a block-wise backlight unit in response to an incoherent illuminating light source such as an LED or the diffused light of an LD

3.6.21
monochromatic incoherent modulation transfer function
monochromatic incoherent MTF
<backlight unit> modulation transfer function of a backlight unit in response to a quasi-monochromatic point light source such as an LED or the diffused light of an LD

Note 1 to entry: The monochromatic incoherent MTF is expressed in spatially modulated light versus spatial frequency (line pair per millimetre).

3.6.22
chromatic incoherent light spread function
chromatic incoherent LSF
<backlight unit> incoherent light spread function of a backlight unit in response to a quasi-monochromatic point light source

3.7 Terms related to backlight dimming

3.7.1
adaptive dimming
temporally low passed image of a local image of an LCD that is displayed on a backlight unit with several blocks for the purpose of image enhancement and power saving

3.7.2
zero-dimensional dimming
0-D dimming
global dimming
manipulation of luminance on a backlight unit in response to a signal from the displayed image on an LCD that is used on the backlight unit

3.7.3
one-dimensional dimming
1-D dimming
line dimming
manipulation of luminance over an area of a one-dimensionally (horizontally) divided backlight unit in response to the image that is going to be displayed on the LC device in the same area

3.7.4
local dimming
block dimming
two-dimensional dimming
2-D dimming
manipulation of luminance over an area of a two-dimensionally (spatially) divided backlight unit in response to the image that is going to be displayed on the LC device at the same area

3.7.5
three-dimensional dimming
3-D dimming
manipulation of the chromaticity over an area of a two dimensionally (spatially) divided backlight unit in response to the image that is going to be displayed on the LC device at the same area

3.7.6
high-dynamic range backlight unit
spatially divided backlight unit that uses a temporally low passed image that is input to an LC device, to enhance the contrast of the displayed image on the display

3.7.7
backlight resolution
number of blocks or segments in a local dimming type backlight unit that can display a low passed filtered image that is input to an LC device

3.7.8
optical noise
<backlight unit> undesired light that leaks from a block to adjacent blocks in one- and two-dimensionally divided backlight units

3.7.9
block-wise optical signal-to-noise ratio
block-wise optical S/N ratio
ratio of angular luminance of one or more adjacent blocks to that of the block under evaluation

Note 1 to entry: For an example, see Figure A.11.

3.7.10
block-wise optimum signal-to-noise ratio
block-wise optimum S/N ratio
ratio of the optimum amount of light (to that of the leaked light) which is transmitted from a block to adjacent blocks for the purpose of smoothing and qualifying the front-of-screen on the display in a one- or two-dimensionally divided backlight unit to the amount of light on the segment or block under evaluation

Note 1 to entry: For an example, see Figure A.9.

3.7.11
crosstalk
<backlight unit> amount of light that leaks from a block to adjacent blocks or segments (optical noise) in a one- or two-dimensionally divided backlight unit, causing independently displayed block image degradation on the LC device

Note 1 to entry: For an example, see Figure A.11.

Note 2 to entry: The measurement of crosstalk is performed by applying a checkerboard pattern in which the on (white) and off (black) segments are created as shown in Figure A.11. The luminance on the centre of the off segment is measured by expanding the off segment pattern by 1 %.

4 Letter symbols (quantity symbols / unit symbols)

The letter symbols for DLUs are shown in Table 1.

Table 1 – Letter symbols (quantity symbols / unit symbols)

Arbitrary luminance of a point	L_{vi} (cd/m^2)
Maximum luminance	L_{vM} (cd/m^2)
Minimum luminance	L_{vm} (cd/m^2)
Average luminance	L_{va} (cd/m^2)
Centre luminance	L_{vc} (cd/m^2)
Luminance uniformity	U (%)
Angular luminance variation	$L_v(x, y; \theta, \varphi)$ (cd/m^2)
Solid angle	Ω (sr)
Colour uniformity	$\Delta u'v'$
Spectral power distribution of a display lighting unit	$S_{DLU}(\lambda)$
LED forward driving current	I_F (mA)

Annex A
(informative)

Supplementary figures

Figures A.1 to A.11 provide examples of various terms defined in the text.

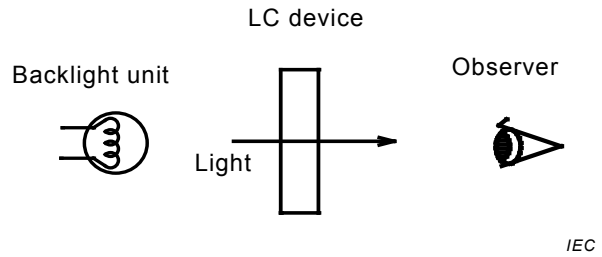
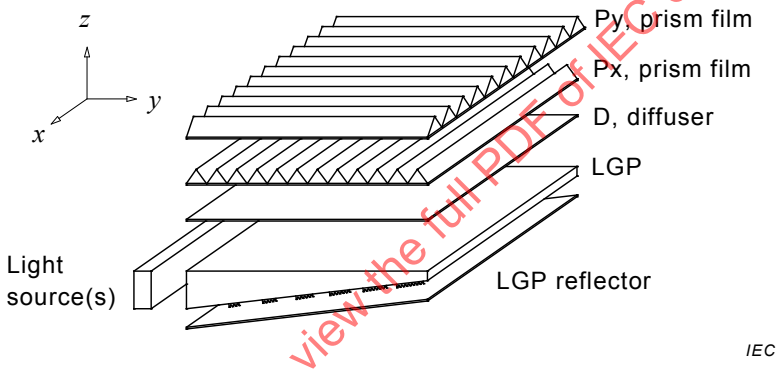
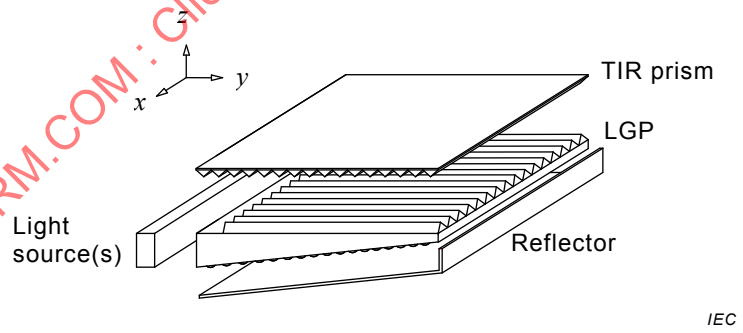


Figure A.1 – Backlighting concept for transmissive and transflective LCDs



a) Conventional edge-lit backlight unit with arbitrary light sources



b) Edge-lit backlight unit with TIR prism (an inverted prism with TIR characteristics) and a functional light guide plate

Figure A.2 – Examples of edge-lit backlight units

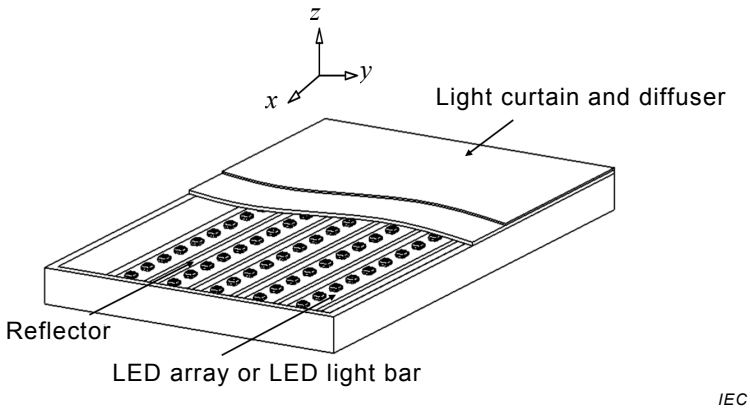


Figure A.3 – Example of a direct-lit backlight unit

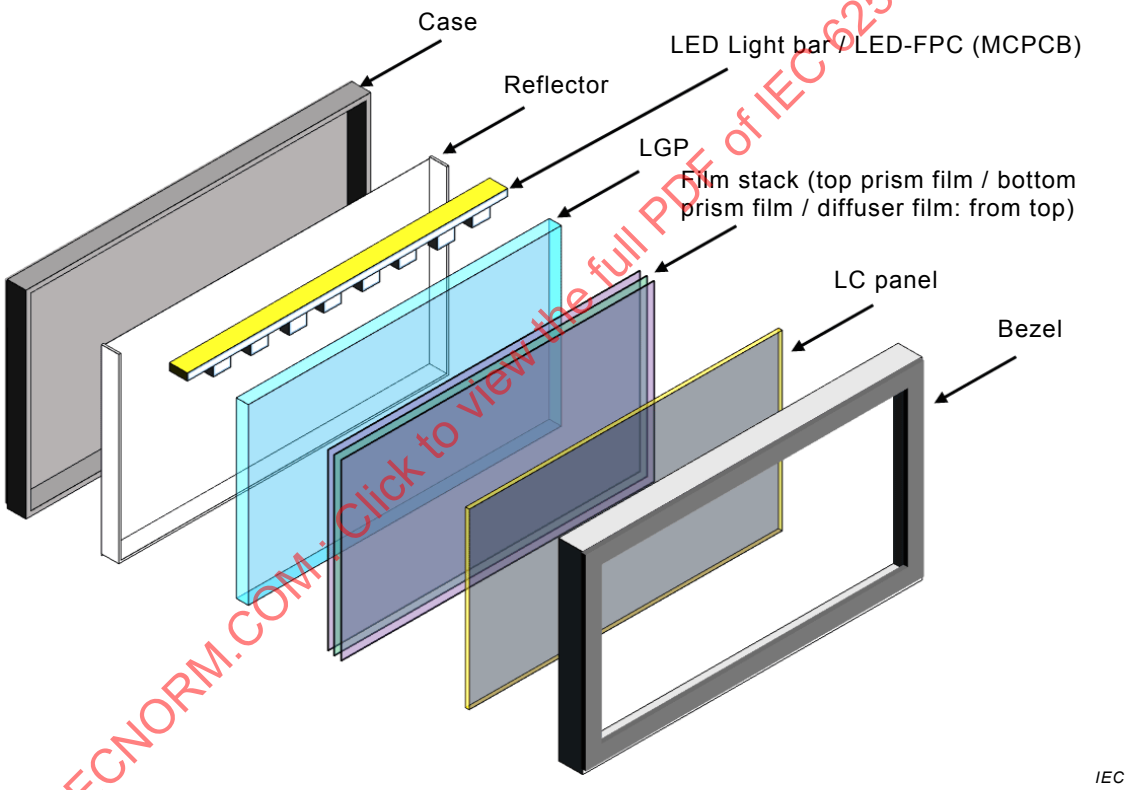


Figure A.4 – Visual definition of the terms related to passive optical components such as bezel and case