



*Federation of National Manufacturers Association for
Luminaires and Electrotechnical Components for
Luminaires in the European Union*



Joint CELMA / ELC Guide on LED related standards

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www.celma.org – www.elcfed.org

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Please note that LED standards are changing rapidly and this guide can only reflect the status of the listed standards on the date published.

Users of this guide should check the latest edition of any standard at the following websites or with your National Trade Association.

www.cenelec.org

www.cen.eu

www.iec.ch

1. LED Product Standards - Overview

Overview of IEC/EN LED Product Standards or Publically Available Specifications (IEC/PAS)

Product type	Safety Standard	Performance Standard
LED Lamp > 50 V (230V) Self-ballasted	62560	IEC/PAS 62612
LED Lamp < 50 V (12V) Self-ballasted	XXXXX In preparation	XXXXX In preparation
LED Lamp Non self-ballasted	62663-1 In preparation	62663-1 In preparation
LED Double capped lamp (LED Tubes)	XXXXX In preparation	-
LED Modules	62031	IEC/PAS 62717
LED Connectors	60838-2-2	-
LED Controlgear (Drivers)	61347-1 61347-2-13	62384
LED Luminaires	60598-1 60598-2-xx	IEC/PAS 62722-1 IEC/PAS 62722-2-1

2. Examples of LED lamps (White light, bulb and reflector type, coloured light)



3. Examples of LED modules

A huge range of LED modules are available on the market and the development of products is very dynamic. But also standardizing of LED modules between manufacturers is in progress.

3.1 Diversity of LED modules



3.2 First "standardized" LED modules available*



* These modules are not (yet) part of any official product standard in IEC or elsewhere

4. Examples of LED connectors



5. Examples of LED controlgear



6. Examples of LED luminaires



7. International LED (related) Standards & OSM/CTL decision sheets for Design, Testing & Measurement

7.1 Available International LED (related) Standards for Design, Testing & Measurement

LAMP/MODULE	
IEC 62031:2008 EN 62031:2008	LED Modules for General Lighting – Safety Specifications
IEC/PAS 62717:2011 No EN version	LED Modules for General Lighting - Performance requirements
IEC 62560:2011 EN 62560: (awaited)	Self-ballasted LED-lamps for general lighting services > 50 V - Safety specifications
IEC/PAS 62612:2009 No EN version	Self-ballasted LED lamps for general lighting services > 50 V - Performance requirements
IEC 60061 series EN 60061 series	Lamp caps and holders together with gauges for the control of interchangeability and safety
IEC 60838-2-2:2006 EN 60838-2-2:2006	Miscellaneous lampholders - Part 2-2: Particular requirements - Connectors for LED-modules
IEC/TR 61341:2010 EN 61341: (awaited)	Method of measurement of centre beam intensity and beam angle(s) of reflector lamps
IEC 61231:2010 EN 61231:2010	International lamp coding system (ILCOS)
IEC/PAS 62707-1:2011 No EN version	LED - Binning - Part 1: General requirements and white grid
CONTROLGEAR	
IEC 61347-1:2007 EN 61347-1:2008	Lamp controlgear - Part 1: General and safety requirements
IEC 61347-2-13:2006 EN 61347-2-13: (awaited)	Lamp controlgear - Part 2-13 : Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules
IEC 62384:2009 EN 62384:2009	DC or AC supplied electronic control gear for LED modules – Performance requirements
IEC 62386-101:2009 EN 62386-101:2009	Digital addressable lighting interface – Part 101: General requirements - System
IEC 62386-102:2009 EN 62386-102:2009	Digital addressable lighting interface – Part 102: General requirements - Control Gear
IEC 62386-207:2009 EN 62386-207:2009	Digital addressable lighting interface – Part 207: Particular requirements for control gear – LED modules (device type 6)

LUMINAIRE	
IEC 60598 series EN 60598 series	Luminaire safety
IEC/PAS 62722-1:2011 No EN version	Luminaire performance - Part 1: General Requirements
IEC/PAS 62722-2-1:2011 No EN version	Luminaire performance - Part 2-1: Particular requirements for LED luminaires
SYSTEM	
IEC/TS 62504:2011 No EN version	Terms and definitions for LEDs and LED modules in general lighting
IEC 62471:2006 EN 62471:2008	Photobiological safety of lamps and lamp systems
IEC/TR 62471-2:2009 No EN version	Photobiological safety of lamps and lamp systems – Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety
MEASUREMENT	
CIE 127:2007	Measurement of LEDs
EN 13032-1:2004	Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Part 1: Measurement and file format
EN 13032-2:2004	Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Part 2: Lighting of indoor work places
EN 13032-3:2007	Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Part 3: Presentation of data for emergency lighting of work places
EMC	
IEC 61547:2009 EN 61547:2009	Equipment for general lighting purposes - EMC immunity requirements
IEC 61000-3-2:2009 EN 61000-3-2:2009	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
CISPR 15:2008 EN 55015:2009	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EMF	
IEC 62493:2009 EN 62493:2010	Assessment of lighting equipment related to human exposure to electromagnetic fields

7.2 International LED (related) Standards or Amendments for Design, Testing & Measurement - UNDER DEVELOPMENT

NEW STANDARDS		Publication expected
IEC 62612 Ed 1	Self-ballasted LED lamps for general lighting services > 50 V - Performance requirements	2011
IEC 62663-1	Non self-ballasted LED lamps - safety	2012
IEC 62663-2	Non self-ballasted LED lamps - performance	2012
IEC/TS 62504 Ed 2	General lighting – LEDs, LED light sources, LED controlgear and LED luminaire – Terms and definitions	2012
IEC 62707-1 Ed 1	LED - Binning - Part 1: General requirements and white grid	2012/13
IEC 62717 Ed 1	LED Modules for General Lighting - Performance requirements	2012/13
IEC 62722-1 Ed 1	Luminaire performance - Part 1: General Requirements	2012/13
IEC 62722-2-1 Ed 1	Luminaire performance - Part 2-1: Particular requirements for LED luminaires	2012/13
IEC xxxxx	Double-capped LED lamps for general lighting services – Safety specifications	2012/13
EN 13032-x	LED luminaire measurements (title to be confirmed)	
AMENDMENTS		Publication expected
IEC 62031 Amd 1	LED Modules for General Lighting - Safety Specifications	2011/2012
IEC 62471-1 Ed 1 (update of IEC 62471)	Photobiological safety of lamps and lamp systems	-
CISPR 15 Amd 3	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	2011/2012

7.3 Committee of Testing Laboratories / Operational Staff Meeting (CTL / OSM) Decision Sheets

CTL/OSM	
DSH 0744	LEDs used as a light source in luminaires
DSH 0745	Luminaire provided with LEDs
DSH 0702	T8 to T5, T8 to T8 and similar lamp adaptors (including ditto with LED)
DSH 0743	Self-ballasted LED lamps
DSH 0749	Insulation of LED lamps
DSH 0748	Portable luminaire or Lighting chain

8. Regional Standards and Specifications for Design, Testing, Measurement & Lighting Applications

8.1 UK - LED Specifications

EST Spec v2 2010	LED Requirements for Replacement Lamps and Modules
EST Spec v3 2010	LED Luminaire Requirements
ECA criteria 2010	White Light Emitting Diode Lighting Units for Amenity, Accent and Display Lighting

8.2 Italy - LED Specifications

UNI 11356:2010	Luce e illuminazione - Caratterizzazione fotometrica degli apparecchi di illuminazione a LED (Light and lighting - Protocol for the measurement of LED luminaires photometric data)
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8.3 USA - LED Standards/Guidance

IESNA LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
IESNA LM-80-08	Approved Method: Lumen Maintenance Testing of LED Light Sources
IESNA RP-16-05	Nomenclature and Definitions for Illuminating Engineering
IESNA TM-16-05	Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
ANSI C78.377:2008	Specifications for the Chromaticity of Solid State Lighting Devices
UL 8750	Outline of Investigation for Light-Emitting Diode (LED) Light Sources for Use in Lighting Products
NEMA SSL 3:2010	High-Power White LED Binning for General Illumination
IESNA TM-21	Life Estimation Test Method (Title to be confirmed)

8.4 European LED related Lighting Applications Standards

EN 12464-1:2011	Light and lighting - Lighting of work places Part 1: Indoor work places
EN 12464-2:2007	Light and lighting - Lighting of work places Part 2: Outdoor work places
EN 12193:2007	Light and lighting - Sports lighting
CEN/TR 13201-1:2004	Road lighting - Part 1: Selection of lighting classes
EN 13201-2:2003	Road lighting - Part 2: Performance requirements
EN 13201-3:2003	Road lighting - Part 3: Calculation of performance
EN 13201-4:2003	Road lighting - Part 4: Methods of measuring lighting performance