

LIF Technical Statement No 44

LED Standards & Guidance

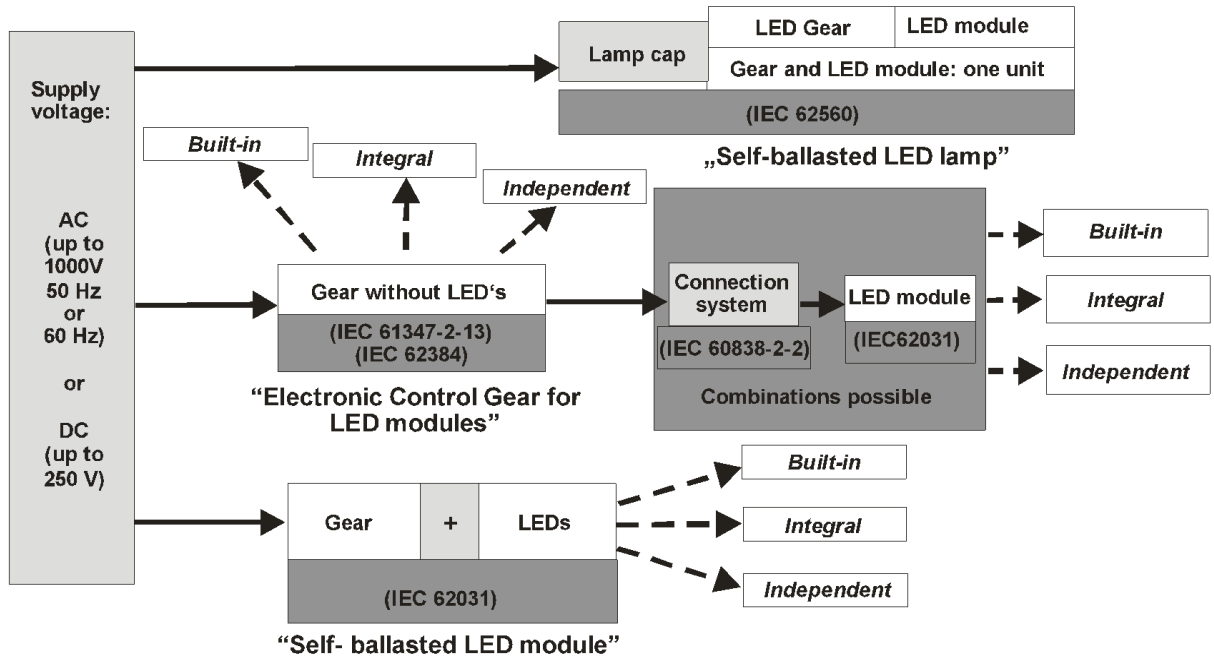
Key Standards for Production, Testing & Measurement of LED Based Luminaires

Overview of IEC (EN) LED Product Standards

| Product type | Safety | Performance |
|--|-----------------------|------------------------------|
| LED Lamp > 50 V (230V) Self-ballasted | 62560 | PAS 62612 |
| LED Lamp < 50 V (12V) Self-ballasted | XXXXXX | XXXXXX |
| LED Lamp Non Self-ballasted | 62663-1 | 62663-2 |
| LED Module | 62031 | PAS 62717 |
| LED Connectors | 60838-2-2 | - |
| LED Control Gear (Drivers) | 61347-1 61347-2-13 | 62384 |
| LED Luminaire | 60598-1 60598-2-xx | PAS 62722-1 PAS 62722-2-1 |

Under development - see later section

TECHNICAL STATEMENT



Examples of LED Modules



Examples of LED lamps



TECHNICAL STATEMENT

LED related Standards for Design, Testing & Measurement

| Lamp/Module | |
|--|--|
| IEC 62031 : 2008 | LED Modules for General Lighting – Safety Specifications |
| IEC 62560 : 2011 | Self-ballasted LED-lamps for general lighting services > 50 V - Safety specifications |
| IEC/PAS 62612 : 2009 | Self-ballasted LED lamps for general lighting services > 50 V - Performance requirements |
| IEC 60061 series | Lamp caps and holders together with gauges for the control of interchangeability and safety |
| IEC 60838-2-2 : 2006 | Miscellaneous lampholders - Part 2-2: Particular requirements - Connectors for LED-modules |
| IEC/TR 61341 : 2010 | Method of measurement of centre beam intensity and beam angle(s) of reflector lamps |
| IEC 61231 : 2010 | International lamp coding system (ILCOS) |
| Control Gear | |
| IEC 61347-1 : 2007 | Lamp controlgear - Part 1: General and safety requirements |
| IEC 61347-2-13 : 2006 | Lamp controlgear - Part 2-13 : Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules |
| IEC 62384 : 2006 + Amd 1 : 2009 | DC or AC supplied electronic control gear for LED modules – Performance requirements |
| IEC 62386-101 : 2009 | Digital addressable lighting interface – Part 101: General requirements - System |
| IEC 62386-102 : 2009 | Digital addressable lighting interface – Part 102: General requirements - Control Gear |
| IEC 62386-207 : 2009 | Digital addressable lighting interface – Part 207: Particular requirements for control gear – LED modules (device type 6) |
| Luminaire | |
| IEC 60598 series | Luminaires |
| System | |
| IEC 62471 : 2006 | Photobiological safety of lamps and lamp systems |
| IEC/TR 62471-2 : 2009 | Photobiological safety of lamps and lamp systems – Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety |

LED related Standards for Design, Testing & Measurement (cont.)

| EMC | |
|-----------------------------|--|
| IEC 61547 : 2009 | Equipment for general lighting purposes - EMC immunity requirements |
| IEC 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 | Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment |
| EMF | |
| IEC 62493 : 2009 | Assessment of lighting equipment related to human exposure to electromagnetic fields |
| 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 |

CTL / OSM Decision Sheets

| CTL/OSM | |
|------------------------|---|
| DSH 0744 : 2009 | LEDs used as a light source in luminaires |
| DSH 0745 : 2009 | 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 |

LED related Standards or Amendments UNDER DEVELOPMENT

| New Standards | | Publication expected |
|---|---|----------------------|
| IEC TS 62504 Ed 1 | Terms and definitions for LEDs and LED modules in general lighting | 2011 |
| IEC PAS 62717 Ed 1 | LED Modules for General Lighting - Performance specifications | 2011 |
| IEC PAS 62722-1 Ed 1 | Luminaire performance - Part 1: General Requirements | 2011 |
| IEC PAS 62722-2-1 Ed 1 | Luminaire performance - Part 2-1: Particular requirements for LED luminaires | 2011 |
| IEC 62612 Ed 1 | Self-ballasted LED lamps for general lighting services > 50 V - Performance requirements | 2011 |
| IEC PAS 62707-1 | LED - Binning - Part 1: General requirements and white grid | 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 |
| EN 13032-x | LED luminaire measurements (check title) | Tba |
| 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 | 2011/12 |

Note - For the latest status of the above drafts please contact the Lighting Association

TECHNICAL STATEMENT

LED related Lighting Application Standards/Guides

| | |
|-----------------------------------|---|
| EN 12464-1 : 2002 | 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 |
| SLL Code for Lighting 2006 | |
| SLL Lighting Handbook 2009 | |
| SLL Lighting Guides | |

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 |

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) |