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Equipment for general lighting purposes – EMC immunity requirements

INTERNATIONAL
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COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EQUIPMENT FOR GENERAL LIGHTING PURPOSES – EMC IMMUNITY REQUIREMENTS

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1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61547 has been prepared by IEC technical committee 34: Lamps and related equipment.

This third edition cancels and replaces the second edition, published in 2009. This edition constitutes a technical revision

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

a) extension of scope with end-user replaceable modules and the combination of end-user replaceable module and independent auxiliary;
b) clarification of module testing in a host system;
c) increased ESD and surge test levels for road and street lighting equipment;
d) the introduction of ESD testing under normal operation and handling conditions;
e) removal of line to ground surge test for self-ballasted lamps ≤ 25 W.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
34/676/FDIS	34/689/RVD

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

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

This document is to be read in conjunction with the relevant basic and/or product standard(s).

A list of all parts in the IEC 61547 series, published under the general title *Equipment for general lighting purposes – EMC immunity requirements*, can be found on the IEC website.

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EQUIPMENT FOR GENERAL LIGHTING PURPOSES – EMC IMMUNITY REQUIREMENTS

1 Scope

This part of IEC 61547 which deals with electromagnetic immunity requirements, applies to lighting equipment which is within the scope of IEC technical committee 34, including apparatus such as lamps, ~~auxiliaries and luminaires, intended either for connecting to a low voltage electricity supply or for battery operation~~ luminaires and modules.

~~Excluded from the scope of this standard is equipment for which the immunity requirements are formulated in other IEC or CISPR standards such as:~~

~~– lighting equipment for use in transport vehicles;~~

~~– entertainment lighting control equipment for professional purposes;~~

~~– lighting devices built into other equipment such as:~~

- ~~scale illumination or indicators;~~
- ~~photocopiers;~~
- ~~slide and overhead projectors;~~
- ~~multimedia equipment.~~

Excluded from the scope of this document are:

– components or modules intended to be built into lighting equipment and which are not end-user replaceable;

– equipment for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other product immunity standards, even if they incorporate a built-in lighting function.

NOTE Examples of exclusions are:

– equipment with built-in lighting devices for display back lighting, scale illumination and signaling;

– SSL-displays;

– range hoods, refrigerators, freezers;

– photocopiers, projectors;

– electronic switches for fixed installations;

– lighting equipment for road vehicles (within the scope of CISPR 12);

– lighting equipment for aircraft and airfield facilities.

However, in multi-function equipment where the lighting ~~part~~ function operates independently from other ~~parts~~ functions, the electromagnetic immunity requirements of this document apply to the lighting ~~part~~ function only.

Lighting equipment with a wireless control function are also within the scope of this document. However, the test is limited to the control of the lighting function only. Radio properties like frequency stability or spurious emissions are not assessed.

EXAMPLE Colour/light level control via a wireless interface are meant to stay intact after an immunity test.

Also included in the scope of this document is lighting equipment that interfaces with systems or installations other than common power supply networks.

The requirements of this document are based on the requirements for domestic, commercial and light-industrial environments as given in IEC 61000-6-1:2016, but modified to lighting engineering practice.

It can be expected that lighting equipment complying with the requirements of this document will operate satisfactorily in other environments. In some special cases, measures ~~have to~~ can be taken to provide higher immunity. In this document it is impracticable to deal with all these possibilities. Such requirements ~~may~~ can be established by contractual agreement between supplier and purchaser.

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.

IEC 60050-161, *International Electrotechnical Vocabulary – Part 161: Electromagnetic Compatibility* (available at http://www.electropedia.org)

IEC 60050-845, *International Electrotechnical Vocabulary – Part 845: Lighting* (available at http://www.electropedia.org)

IEC 60598-1:~~2008~~2014, *Luminaires – Part 1: General requirements and tests*

~~IEC 60598-2-22, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*~~

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio frequency, electromagnetic field immunity test* ~~[1]~~
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:~~2004~~2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:~~2005~~2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:~~2008~~2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:~~1993~~2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test* ~~[2]~~
~~Amendment 1 (2000)~~

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity*

~~[1] There exists a consolidated edition 3.1 (2008) that comprises IEC 61000-4-3 and its Amendment 1.~~

~~[2] There exists a consolidated edition 1.1 (2001) that comprises IEC 61000-4-8 and its Amendment 1.~~

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IEC 61000-4-11:2004/AMD1:2017

~~IEC 61000-6-1:2005, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments*~~

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Edition 3.0 2020-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Equipment for general lighting purposes – EMC immunity requirements

Équipements pour l'éclairage à usage général – Exigences concernant l'immunité CEM



IEC 61547:2020-03(en-fr)

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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La Norme internationale IEC 61547 a été établie par le comité d'études 34 de l'IEC: Lampes et équipements associés.

Cette troisième édition annule et remplace la deuxième édition parue en 2009. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) extension du domaine d'application des modules remplaçables par l'utilisateur final et de la combinaison d'un module remplaçable par l'utilisateur final et d'un accessoire indépendant;
b) clarification de l'essai du module dans un système hôte;

c) augmentation des niveaux d'essai des décharges électrostatiques et d'ondes de choc des appareils d'éclairage public;

d) introduction d'un essai de décharge électrostatique dans des conditions normales de fonctionnement et des conditions de manutention;

e) retrait de l'essai d'ondes de choc entre phase et terre pour les lampes à ballast intégré ≤ 25 W.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
34/676/FDIS	34/689/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Le présent document doit être lu conjointement avec les normes fondamentales et/ou celles applicables aux produits correspondants.

Une liste de toutes les parties de la série IEC 61547, publiées sous le titre général *Équipements pour l'éclairage à usage général – Exigences concernant l'immunité CEM*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
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ÉQUIPEMENTS POUR L'ÉCLAIRAGE À USAGE GÉNÉRAL – EXIGENCES CONCERNANT L'IMMUNITÉ CEM

1 Domaine d'application

La présente partie de l'IEC 61547 qui traite des exigences d'immunité électromagnétique s'applique aux appareils d'éclairage relevant du domaine d'application du comité d'études 34 de l'IEC, tels que les lampes, les luminaires et les modules.

Sont exclus du domaine d'application du présent document:

– les composants ou modules destinés à être incorporés dans des appareils d'éclairage et qui ne sont pas remplaçables par l'utilisateur final;
– les appareils pour lesquels les exigences de compatibilité électromagnétique dans la plage de radiofréquences sont formulées explicitement dans d'autres normes d'immunité des produits, même s'ils intègrent une fonction d'éclairage incorporée.

NOTE Exemples d'exclusions:

– appareils avec des dispositifs d'éclairage incorporés pour le rétroéclairage, appareils pour échelle de mise au point de l'éclairage et appareils pour la signalisation;
– affichages SSL;
– hottes, réfrigérateurs, congélateurs;
– photocopieurs, projecteurs;
– commutateurs électroniques pour installations fixes;
– appareils d'éclairage des véhicules routiers (relevant du domaine d'application de la CISPR 12);
– appareils d'éclairage aéronautiques et des installations aériennes.

Cependant, dans les appareils multifonctions pour lesquels la fonction éclairage fonctionne indépendamment du reste, les exigences d'immunité électromagnétique du présent document s'appliquent à la fonction éclairage uniquement.

Les appareils d'éclairage comportant une fonction de commande sans fil relèvent également du domaine d'application du présent document. Cependant, l'essai est limité à la commande de la fonction éclairage uniquement. Les propriétés radio, comme la stabilité de la fréquence ou les émissions parasites, ne sont pas évaluées.

EXEMPLE La commande du niveau de couleur/lumière au moyen d'une interface sans fil est censée rester intacte après un essai d'immunité.

Sont également inclus dans le domaine d'application du présent document les appareils d'éclairage qui s'interfacent avec des systèmes ou des installations autres que des réseaux d'alimentation communs.

Les exigences du présent document sont fondées sur les exigences de l'environnement domestique, commercial et de l'industrie légère, comme cela est indiqué dans l'IEC 61000-6-1:2016, mais modifiées en fonction de la pratique de la science de l'éclairage.

Il peut être attendu que l'appareil d'éclairage satisfaisant aux exigences du présent document fonctionne de manière satisfaisante dans d'autres environnements. Dans des cas spéciaux, des mesures peuvent être prises afin d'assurer une plus grande immunité. Il n'est pas possible, dans le présent document, de tenir compte de toutes ces possibilités. De telles exigences peuvent être établies par accord contractuel entre le fournisseur et l'acheteur.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050-161, *Vocabulaire Électrotechnique International – Partie 161: Compatibilité électromagnétique* (disponible à l'adresse http://www.electropedia.org)

IEC 60050-845, *Vocabulaire Électrotechnique International – Partie 845: Éclairage* (disponible à l'adresse http://www.electropedia.org)

IEC 60598-1:2014, *Luminaires – Partie 1: Exigences générales et essais*

IEC 61000-4-2:2008, *Compatibilité électromagnétique (CEM) – Partie 4-2: Techniques d'essai et de mesure – Essai d'immunité aux décharges électrostatiques*

IEC 61000-4-3:2006, *Compatibilité électromagnétique (CEM) – Partie 4-3: Techniques d'essai et de mesure – Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques*
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2012, *Compatibilité électromagnétique (CEM) – Partie 4-4: Techniques d'essai et de mesure – Essai d'immunité aux transitoires électriques rapides en salves*

IEC 61000-4-5:2014, *Compatibilité électromagnétique (CEM) – Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:2013, *Compatibilité électromagnétique (CEM) – Partie 4-6: Techniques d'essai et de mesure – Immunité aux perturbations conduites, induites par les champs radioélectriques*

IEC 61000-4-8:2009, *Compatibilité électromagnétique (CEM) – Partie 4-8: Techniques d'essai et de mesure – Essai d'immunité au champ magnétique à la fréquence du réseau*

IEC 61000-4-11:2004, *Compatibilité électromagnétique (CEM) – Partie 4-11: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension*
IEC 61000-4-11:2004/AMD1:2017

IEC CISPR 15:2018, *Limites et méthodes de mesure des perturbations radioélectriques produites par les appareils électriques d'éclairage et les appareils analogues*