

Valgustusseadmete hindamine inimesele toimivate elektromagnetväljade järgi

Assessment of lighting equipment related to human
exposure to electromagnetic fields

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 62493:2010 sisaldab Euroopa standardi EN 62493:2010 ingliskeelset teksti.

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**Assessment of lighting equipment related to human exposure
to electromagnetic fields**
(IEC 62493:2009)

Evaluation d'un équipement d'éclairage
relativement à l'exposition humaine
aux champs électromagnétiques
(CEI 62493:2009)

Beurteilung
von Beleuchtungseinrichtungen
bezüglich der Exposition von Personen
gegenüber elektromagnetischen Feldern
(IEC 62493:2009)

This European Standard was approved by CENELEC on 2010-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented
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- latest date by which the national standards conflicting
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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62493:2009 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62311 (mod)	2007	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)	EN 62311	2008
CISPR 15	2005	Limits and methods of measurement of radio	EN 55015	2006
+ A1	2006	disturbance characteristics of electrical	+ A1	2007
+ A2	2008	lighting and similar equipment	+ A2	2009
CISPR 16-1-1	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1	-
CISPR 16-1-2	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	EN 55016-1-2	-
CISPR 16-4-2	2003	Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements	EN 55016-4-2	2004
IEEE C95.1-2005	-	Safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz	-	-

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INTRODUCTION

This International Standard establishes a suitable evaluation method for determining the electromagnetic fields in the space around the equipment mentioned in the scope, and defines standardized operating conditions and measurement distances.

This standard is designed to assess, by measurements and/or calculations, electromagnetic (EM) fields and their potential effect on the human body by reference to exposure levels of the general public given by ICNIRP:1998 [1]¹⁾, IEEE C95.1:2005 and IEEE C95.6:2002[2]. The exposure levels with which to comply are basic restrictions (both ICNIRP- and IEEE-based).

NOTE 1 Maximum permissible exposure levels (IEEE-based) or reference levels (ICNIRP-based) are not used.

Based on the lighting equipment operating properties, the frequency range of the applicable basic restrictions can be limited as follows:

- induced current density between 20 kHz to 10 MHz;
- specific absorption rate (SAR) between 100 kHz to 300 MHz;
- power density is outside the scope.

NOTE 2 Operating frequencies of lighting equipment are higher than 20 kHz to avoid audible noise and infrared interference. Frequency contributions above 300 MHz can be neglected.

This standard is not meant to supplant definitions and procedures specified in exposure standards, but it is aimed at supplementing the procedure already specified for compliance with exposure.

The exposure limits given in Annex C (informative) are for information only, do not comprise an exhaustive list and are valid only in certain regions of the world. It is the responsibility of users of this standard to ensure that they use the current version of the limit values specified by the applicable national authorities.

1) Figures in square brackets refer to the Bibliography.

ASSESSMENT OF LIGHTING EQUIPMENT RELATED TO HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

1 Scope

This International Standard applies to the assessment of lighting equipment related to human exposure to electromagnetic fields. The assessment consists of the induced current density for frequencies from 20 kHz to 10 MHz and the specific absorption rate (SAR) for frequencies from 100 kHz to 300 MHz around lighting equipment.

Included in the scope of this standard are:

- all lighting equipment for general lighting with a primary function of generating and/or distributing light intended for illumination purposes, and intended either for connection to the low voltage electricity supply or for battery operation; used indoor and/or outdoor. General lighting equipment means all industrial, residential and public and street lighting;
- lighting part for general lighting of multi-function equipment where one of the primary functions of this is illumination;
- independent auxiliaries exclusively for the use with lighting equipment.

Excluded from the scope of this standard are:

- lighting equipment for aircraft and airfields;
- lighting equipment for road vehicles; (except lighting used for the illumination of passenger compartments in public transport);
- lighting equipment for agriculture;
- lighting equipment for boats/vessels;
- photocopiers, slide projectors;
- apparatus for which the requirements of electromagnetic fields are explicitly formulated in other IEC standards;

NOTE The methods described in this standard are not suitable for comparing the fields from different lighting equipment.

This standard does not apply to built-in components for luminaires such as electronic control gear.

2 Normative references

The following referenced documents are indispensable for the application 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.

CISPR 15:2005²⁾, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*
Amendment 1 (2006)
Amendment 2 (2008)

²⁾ There exists of a consolidated edition 7.2 (2009), including CISPR 15:2005 and its Amendment 1 and Amendment 2.

CISPR 16-1-1, *Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus.*

CISPR 16-1-2, *Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment, conducted disturbances*

CISPR 16-4-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods. Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements*

IEC 62311:2007, *Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)*

IEEE Std C95.1-2005, *IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz*

3 Terms, definitions, physical quantities and units

3.1 Terms and definitions

For the purpose of this standard the following terms and definitions will apply, the international accepted SI-units are used throughout the standard.

3.1.1

basic restriction (basic limitations)

restrictions on exposure to time-varying electric, magnetic and electromagnetic fields that are based on established biological effects and including a safety factor. The basic restriction is the maximum level that should not be exceeded under any conditions.

3.1.2

exposure

exposure occurs whenever and wherever a person is subjected to electric, magnetic or electromagnetic fields or to contact currents other than those originating from physiological processes in the body and other natural phenomena.

3.1.3

measurement distance

distance between the lighting equipment and the external surface of the measurement test-head (see Annex A)

3.1.4

measurement point

position and location of the measurement test-head relative to the lighting equipment

3.1.5

lamp control gear

one or more components between the supply and one or more lamps which may serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference

3.1.6

built-in lamp control gear

lamp control gear generally designed to be built into a luminaire, a box, an enclosure or the like and not intended to be mounted outside a luminaire, etc. without special precautions. The