

INTERNATIONAL STANDARD

NORME INTERNATIONALE



AMENDMENT 1

AMENDEMENT 1

Assessment of lighting equipment related to human exposure to
electromagnetic fields

(standards.iteh.ai)

Évaluation d'un équipement d'éclairage relativement à l'exposition humaine
aux champs électromagnétiques

<https://standards.iteh.ai/catalog/standards/sist/6ea3ca9a-938a-40cd-b9fb-7cad53f76517/iec-62493-2015-amd1-2022>





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**Assessment of lighting equipment related to human exposure to
electromagnetic fields** (standards.iteh.ai)

**Évaluation d'un équipement d'éclairage relativement à l'exposition humaine
aux champs électromagnétiques** [493:2015/AMD1:2022](https://standards.iteh.ai/catalog/standards/sist/6ea3ca9a-938a-40cd-b9fb-7cad53f76517/iec-62493-2015-amd1-2022)

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TO HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS****AMENDMENT 1****FOREWORD**

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Amendment 1 to IEC 62493:2015 has been prepared by IEC technical committee 34: Lighting.

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

Draft	Report on voting
34/827/CDV	34/906/RVC

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

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications/.

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INTRODUCTION

Replace the second paragraph of the introduction with the following new paragraph:

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 2020 [1]¹, ICNIRP 2010 [2], IEEE C95.1:2005 [3] and IEEE C95.6:2002 [4]. The exposure levels with which to comply are basic restrictions (both ICNIRP- and IEEE-based).

3 Terms, definitions, physical quantities, units and abbreviations

3.1.14

intentional radiator

Add the following Note to entry to terminological entry 3.1.14:

Note 1 to entry: Devices that are designed to only receive electromagnetic fields from other sources are not considered as intentional radiators. For example, near field communication (NFC) transducers are not considered as intentional radiators.

4 Limits

4.1 General

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Replace the first paragraph of 4.1 with the following new paragraph and note:

The basic restrictions or reference levels for the general public of either IEEE C95.1-2005 or ICNIRP (ICNIRP 2020 and ICNIRP 2010) are used, see Annex C.

NOTE Reference levels have been taken from ICNIRP publications however, basic restrictions of IEEE and ICNIRP are essentially the same.

6 Measurement procedure for the Van der Hoofden test

6.1 General

Replace the first sentence of 6.1 with the following new sentence:

The assessment method is based on basic restrictions given in both ICNIRP 2020 and ICNIRP 2010, or in IEEE C95.1-2005.

7.2.3 Determination of the low-power exclusion level

Replace the third sentence of 7.2.3 with the following new sentence:

¹ Numbers in square brackets refer to the Bibliography.

For instance for ICNIRP 2020, general public exposure, the worst case low-power exclusion level is 20 mW for head and trunk.

C.2 ICNIRP

Replace the existing Clause C.2, including its title, with the following new Clause C.2:

C.2 ICNIRP basic restrictions

C.2.1 Basic restrictions - SAR

Table C.1 provides the basic restrictions (SAR) for general public exposure to time varying electric and magnetic fields for frequencies between 100 kHz and 300 GHz (see [1]):

Table C.1 – Basic restrictions for general public exposure to time varying electric and magnetic fields for frequencies between 100 kHz and 300 GHz

Frequency range	Average SAR (whole body) W/kg	Localised SAR (head and trunk) W/kg	Localised SAR (limbs) W/kg
100 kHz to 6 GHz	0,08	2	4
> 6 GHz to 300 GHz	0,08	NA ^a	NA ^a

^a NA signifies "not applicable" and does not need to be taken into account when determining compliance.

C.2.2 Basic restrictions – Internal electric field
<https://standards.iec.ch/catalog/standards/sist/6ea3ca9a-938a-40cd-b9fb-7cad53f76517/iec-62493-2015/amd1:2022>
 Table C.2 provides the basic restrictions for general public exposure to time varying electric and magnetic fields for frequencies up to 10 MHz (see [1], [2]):

Table C.2 – Basic restrictions for general public exposure to time varying electric and magnetic fields for frequencies up to 10 MHz

Exposure characteristic	Frequency range	Internal electric field V/m
CNS tissue of the head	1 Hz to 10 Hz	0,1/f
	10 Hz to 25 Hz	0,01
	25 Hz to 1 kHz	$4 \times 10^{-4}f$
	1 kHz to 3 kHz	0,4
	3 kHz to 10 MHz	$1,35 \times 10^{-4}f$
All other tissues (head and body)	1 Hz to 3 kHz	0,4
	3 kHz to 10 MHz	$1,35 \times 10^{-4}f$

f is the frequency in Hz.
 All values are RMS.

C.2.3 Changes introduced by ICNIRP 2020 with respect to ICNIRP 1998 and ICNIRP 2010

Changes for the basic restrictions (SAR) from ICNIRP 1998 to ICNIRP 2020 have been made by (i) extending the considered spectrum up to 100 GHz, while (ii) between 100 kHz and 6 GHz limits remain unchanged and (iii) for frequencies above 6 GHz it has been found that they do not need to be taken into account when determining compliance.

For the basic restrictions (internal electric field) ICNIRP 2010 remains applicable for frequencies below 100 kHz, while those above have been replaced by ICNIRP 2020. In ICNIRP 2020 up to 10 MHz a general limit of $1,35 \times 10^{-4} \times f$ is applicable, without differentiation between central nervous system (CNS) tissue of the head and other.

As a result, products found compliant with the basic restrictions of ICNIRP 1998 and ICNIRP 2010 are compliant with the basic restrictions of ICNIRP 2020, given that no changes have been introduced in the lighting equipment relevant frequency ranges (SAR: 20 kHz to 10 MHz and 100 kHz to 300 MHz for the internal electric field).

Figure D.4 – Induced internal electric field and associated limit levels

Replace in the key to Figure D.4, "ICNIRP2010 limit CNS tissue head from table" with "ICNIRP 2010/ICRIRP 2020 limit CNS tissue head from table" as follows:

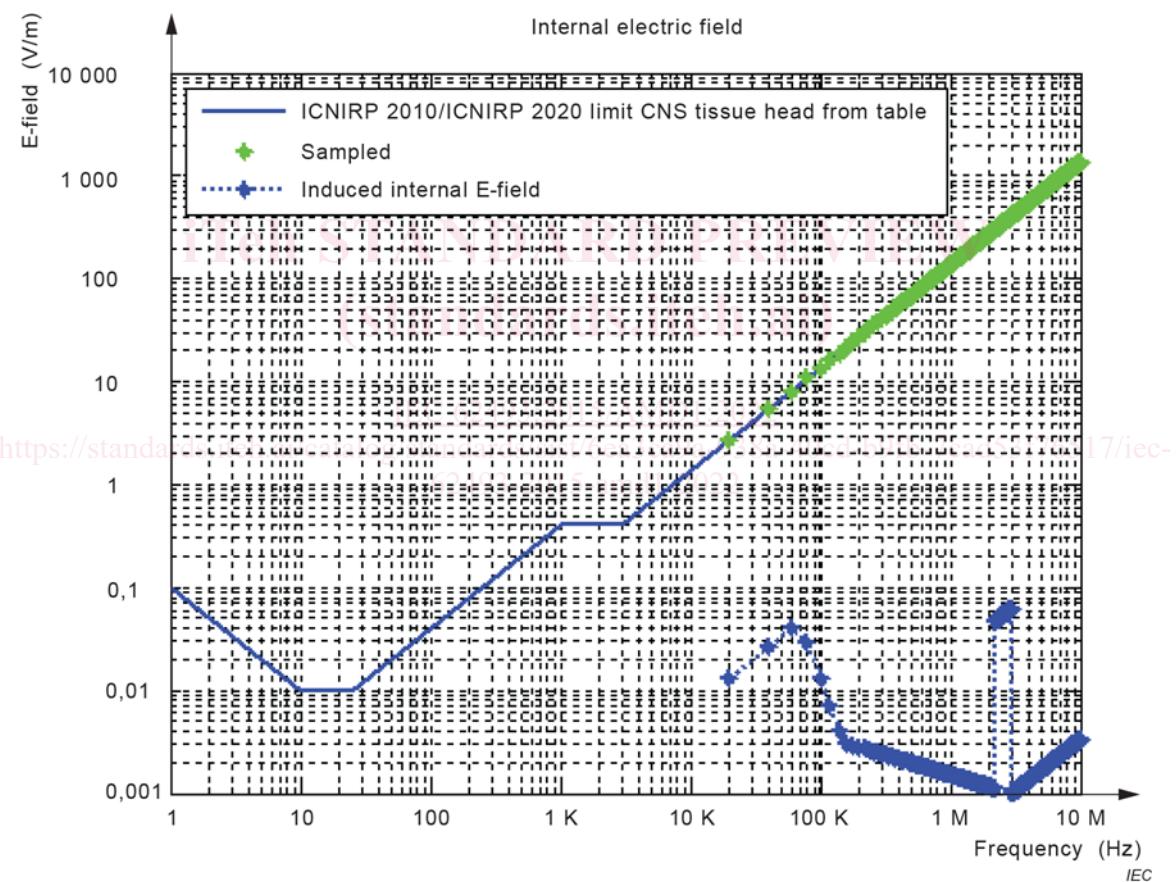


Figure D.4 – Induced internal electric field and associated limit levels

I.3 Properties of antennas in lighting applications

Replace in the seventh paragraph beginning with "Figure I.4 shows the electric field...", the sixth sentence beginning with "When looking at the impact..." with the following new sentence:

When looking at the impact of various power levels one can see that an input power of 20 mW always gives field levels well below the ICNIRP 2020 worst-case reference of 28 V/m.

I.4 Exposure assessment approach

I.4.1 General

Replace the first sentence of the second paragraph of I.4.1 with the following new sentence:

It can, for instance be easily derived from the 2 W/kg SAR basic restriction that applies for the head in both ICNIRP 2020 and in IEEE C95.1-2005 in a 10 g voxel (volumetric pixel) of tissue.

I.4.3 Determination of the low-power exclusion level P_{\max}

Replace the third sentence of the first paragraph of I.4.3 with the following new sentence:

For instance, for ICNIRP 2020, general public exposure, the worst case low-power exclusion level is 20 mW for head and trunk.

Bibliography

Replace the first bibliographical reference [1] with the following new reference [1]:

- [1] ICNIRP 2020, *Guidelines for limiting exposure to electromagnetic fields (100 KHz to 300 GHz)*, Health Phys 118(5): 483–524

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**ÉVALUATION D'UN ÉQUIPEMENT D'ÉCLAIRAGE RELATIVEMENT À
L'EXPOSITION HUMAINE AUX CHAMPS ÉLECTROMAGNÉTIQUES****AMENDEMENT 1****AVANT-PROPOS**

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Le texte de cet Amendement est issu des documents suivants:

Projet	Rapport de vote
34/827/CDV	34/906/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cet Amendement est l'anglais.