
**Mejne vrednosti in metode merjenja karakteristik občutljivosti za radijske
motnje električne razsvetljave in podobne opreme (CISPR 15:2005)**

Limits and methods of measurement of radio disturbance characteristics of
electrical lighting and similar equipment (CISPR 15:2005)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 55015:2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007)

[https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-
e7b31eaa6bf3/sist-en-55015-2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 55015:2007

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007>

English version

**Limits and methods of measurement of radio disturbance characteristics
of electrical lighting and similar equipment
(CISPR 15:2005)**

Limites et méthodes de mesure des
perturbations radioélectriques produites
par les appareils électriques d'éclairage
et les appareils analogues
(CISPR 15:2005)

Grenzwerte und Messverfahren
für Funkstörungen von elektrischen
Beleuchtungseinrichtungen
und ähnlichen Elektrogeräten
(CISPR 15:2005)

iTeh STANDARD PREVIEW

This European Standard was approved by CENELEC on 2006-09-12. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document CISPR/F/402/FDIS, future edition 7 of CISPR 15, prepared by CISPR SC F, Interference relating to household appliances, tools, lighting equipment and similar apparatus, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 55015 on 2006-09-12.

This European Standard supersedes EN 55015:2000 + A1:2001 + A2:2002.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2007-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-09-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 89/336/EEC and 2004/108/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

iTeh STANDARD PREVIEW
Endorsement notice
(standards.iteh.ai)

The text of the International Standard CISPR 15:2005 was approved by CENELEC as a European Standard without any modification.

[SIST EN 55015:2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007)

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007>

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 60050-161	1990	International Electrotechnical Vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
IEC 60155	1993	Glow-starters for fluorescent lamps	EN 60155	1995
IEC 60598-1 (mod)	2003	Luminaires Part 1: General requirements and tests	EN 60598-1	2004
CISPR 11 (mod)	2003	Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	EN 55011	200X ¹⁾
CISPR 16-1-1	2003	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	2004
CISPR 16-1-2	2003	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	2004
CISPR 16-1-4	2003	Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	EN 55016-1-4	2004
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements	EN 55016-2-1	2004
CISPR 22 (mod)	2005	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022	2006

¹⁾ To be published.

Annex ZZ
(informative)

Coverage of Essential Requirements of EC Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers essential requirements as given in Article 4(a) of EC Directive 89/336/EEC and Annex I Article 1(a) of EC Directive 2004/108/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directives concerned.

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 55015:2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007)

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007>

COMMISSION
ÉLECTROTECHNIQUE
INTERNATIONALE

CISPR
15

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

Septième édition
Seventh edition
2005-11

COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**Limites et méthodes de mesure des perturbations
radioélectriques produites par les appareils
électriques d'éclairage et les appareils analogues**

**Limits and methods of measurement of radio
disturbance characteristics of electrical lighting
and similar equipment**

iTeh STANDARD PREVIEW

(standards.iteh.ai)

© IEC 2005 - Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni
utilisée sous quelque forme que ce soit et par aucun procédé,
électronique ou mécanique, y compris la photocopie et les
microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any
form or by any means, electronic or mechanical, including
photocopying and microfilm, without permission in writing from
the publisher.

International Electrotechnical Commission, 3, rue de Varembe, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

X

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

FOREWORD..... 9

1 Scope..... 13

2 Normative references..... 15

3 Terms and definitions 15

4 Limits 17

 4.1 Frequency ranges..... 17

 4.2 Insertion loss..... 17

 4.3 Disturbance voltages 17

 4.4 Radiated electromagnetic disturbances..... 19

5 Application of the limits 21

 5.1 General 21

 5.2 Indoor luminaires..... 21

 5.3 Independent auxiliaries exclusively for use with lighting equipment..... 23

 5.4 Self-ballasted lamps 27

 5.5 Outdoor lighting appliances..... 27

 5.6 UV and IR radiation appliances..... 29

 5.7 Transport lighting..... 31

 5.8 Neon and other advertising signs 33

 5.9 Self-contained emergency lighting luminaires..... 33

 5.10 Replaceable starters for fluorescent lamps..... 33

6 Operating conditions for lighting equipment..... 35

 6.1 General 35

 6.2 Lighting equipment 35

 6.3 Supply voltage and frequency 35

 6.4 Ambient conditions 35

 6.5 Lamps 35

 6.6 Replaceable starters..... 37

7 Method of insertion loss measurement 37

 7.1 Circuits for the measurement of insertion loss..... 37

 7.2 Measuring arrangement and procedure..... 39

 7.3 Luminaire 39

 7.4 Measurement procedure..... 41

8 Method of measurement of disturbance voltages..... 43

 8.1 Measuring arrangement and procedure..... 43

 8.2 Indoor and outdoor luminaires..... 45

 8.3 Independent light regulating devices..... 47

 8.4 Independent transformers and convertors for incandescent lamps..... 47

 8.5 Independent ballasts for fluorescent and other discharge lamps..... 49

 8.6 Self-ballasted lamps and semi-luminaires 49

 8.7 UV and IR radiation appliances..... 51

 8.8 Self-contained emergency lighting luminaires..... 51

 8.9 Independent starters and igniters for fluorescent and other discharge lamps 51

ITC STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 55015:2007
<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31ca66b3/sist-en-55015-2007>

9	Method of measurement of radiated electromagnetic disturbances	51
9.1	Measuring arrangement and procedure	51
9.2	Indoor and outdoor luminaires.....	53
9.3	Independent convertors for incandescent lamps.....	53
9.4	Independent ballasts for fluorescent and other discharge lamps	53
9.5	Self-ballasted lamps and semi-luminaires	53
9.6	UV and IR radiation appliances	53
9.7	Self-contained emergency lighting luminaires.....	53
10	Interpretation of CISPR radio disturbance limits	53
10.1	Significance of a CISPR limit	53
10.2	Tests	55
10.3	Statistical method of evaluation.....	55
10.4	Banning of sales	57
	Annex A (normative) Electrical and constructional requirements for the low-capacitance balance-to-unbalance transformer.....	83
	Figure 1 – Insertion loss measurement on linear and U-type fluorescent lamp luminaires	59
	Figure 2 – Insertion loss measurement on circular fluorescent lamp luminaires	61
	Figure 3 – Insertion loss measurement on luminaires for single-capped fluorescent lamps with integrated starter	63
	Figure 4a – Configuration of linear and U-type dummy lamps.....	65
	Figure 4b – Configuration of circular dummy lamps.....	67
	Figure 4c – Dummy lamp for 15 mm fluorescent lamps	69
	Figure 4d – Dummy lamp for 15 mm single-capped fluorescent lamps	71
	Figure 4e – Dummy lamp for single-capped fluorescent lamps, linear-shaped, twin tube, tube diameter 12 mm.....	73
	Figure 4f – Dummy lamp for single-capped fluorescent lamps, linear-shaped, quad tube, diameter 12 mm.....	75
	Figure 5 – Measuring arrangements for an independent light regulating device, transformer or convertor.....	77
	Figure 6 – Measuring arrangements for measuring a luminaire (Figure 6a), an independent ballast (Figure 6b) and a self-ballasted lamp (Figure 6c)	79
	Figure 7 – Conical metal housing for self-ballasted fluorescent lamps.....	81
	Figure A.1 – Isolation test configuration.....	85
	Figure A.2a – Balance-to-unbalance transformer circuit.....	87
	Figure A.2b – Details of transformer core construction.....	89
	Figure A.2c – Details of transformer core construction.....	89
	Figure A.2d – Construction of transformer.....	91

STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 55015:2007

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4178-9b86->

[c7b51caabb/sist-en-55015-2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4178-9b86-)

Table 1 – Minimum values of insertion loss.....	17
Table 2a – Disturbance voltage limits at mains terminals	17
Table 2b – Disturbance voltage limits at load terminals.....	19
Table 2c – Disturbance voltage limits at control terminals	19
Table 3 – Radiated electromagnetic disturbance limits.....	21
Table 4 – Sample size and corresponding <i>k</i> factor in a non-central t-distribution	55

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 55015:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007>

INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**LIMITS AND METHODS OF MEASUREMENT OF
RADIO DISTURBANCE CHARACTERISTICS OF ELECTRICAL LIGHTING
AND SIMILAR EQUIPMENT**

FOREWORD

- 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard CISPR 15 has been prepared by CISPR subcommittee F: Interference relating to household appliances, tools, lighting equipment and similar apparatus.

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-57b31ea16b37/sist-15015:2007>

This seventh edition of CISPR 15 cancels and replaces the sixth edition published in 2000, its amendment 1 (2001) and amendment 2 (2002).

The text of this standard is based on the sixth edition, amendment 1, amendment 2 and the following documents:

FDIS	Report on voting
CISPR/F/402/FDIS	CISPR/F/410/RVD

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

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 55015:2007](https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007)

<https://standards.iteh.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-e7b31eaa6bf3/sist-en-55015-2007>

LIMITS AND METHODS OF MEASUREMENT OF RADIO DISTURBANCE CHARACTERISTICS OF ELECTRICAL LIGHTING AND SIMILAR EQUIPMENT

1 Scope

This standard applies to the emission (radiated and conducted) of radiofrequency disturbances from:

- all lighting equipment 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;
- the lighting part of multi-function equipment where one of the primary functions of this is illumination;
- independent auxiliaries exclusively for use with lighting equipment;
- UV and IR radiation equipment;
- neon advertising signs;
- street/flood lighting intended for outdoor use;
- transport lighting (installed in buses and trains).

Excluded from the scope of this standard are:

- lighting equipment operating in the ISM frequency bands (as defined in Resolution 63 (1979) of the ITU Radio Regulation);
- lighting equipment for aircraft and airports;
- apparatus for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other IEC or CISPR standards.

NOTE Examples are:

- built-in lighting devices in other equipment, for example scale illumination or neon devices;
- photocopiers;
- slide projectors;
- lighting equipment for road vehicles.

The frequency range covered is 9 kHz to 400 GHz.

Multi-function equipment which is subjected simultaneously to different clauses of this standard and/or other standards shall meet the provisions of each clause/standard with the relevant functions in operation.

[SIST EN 55015:2007](https://standards.itech.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-c9b1aa6b938c/cispr-15-2007)

[https://standards.itech.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-](https://standards.itech.ai/catalog/standards/sist/b565beb7-5934-4f78-9b86-c9b1aa6b938c/cispr-15-2007)

The limits in this standard have been determined on a probabilistic basis to keep the suppression of disturbances within economically reasonable limits while still achieving an adequate level of radio protection and electromagnetic compatibility. In exceptional cases, additional provisions may be required.

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.

IEC 60050(161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60155:1993, *Glow-starters for fluorescent lamps*

IEC 60598-1:2003, *Luminaires – Part 1: General requirements and tests*

CISPR 11:2003, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*

CISPR 16-1-1:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*

CISPR 16-1-4:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances*

CISPR 16-2-1:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*

CISPR 22:2005, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions contained in IEC 60050(161) apply.

Continuous disturbance may be either broadband, for instance caused by the switching operations or by unstable gas-discharges in the lamp electrode region, or may be narrowband, for instance caused by electronic control devices operating at dedicated frequencies.

NOTE Instead of the concept of "broadband" and "narrowband", a distinction is made in this standard between two related kinds of disturbance, defined by the type of the applied detector. For this purpose, limits have been defined with respect to the measurement with the quasi-peak detector and with the average detector. By using this approach, a combination of broadband and narrowband disturbances can also be assessed.

e7b31eaa6b3/sist-en-55015-2007

4 Limits

4.1 Frequency ranges

In 4.2, 4.3 and 4.4, limits are given as a function of frequency range. No measurements need to be performed at frequencies where no limits are specified.

NOTE The World Administrative Radiocommunications Conference (WARC) has in 1979 reduced the lower frequency limit in region 1 to 148,5 kHz; for applications falling within the scope of this standard, tests at 150 kHz are considered adequate, since 148,5 kHz falls within the receiver bandwidth.

4.2 Insertion loss

The minimum values of the insertion loss for the frequency range 150 kHz to 1 605 kHz are given in Table 1.

Table 1 – Minimum values of insertion loss

Frequency range kHz	Minimum values dB
150 to 160	28
160 to 1 400	28 to 20 ^a
1 400 to 1 605	20
^a Decreasing linearly with the logarithm of frequency.	

4.3 Disturbance voltages

4.3.1 Mains terminals

The limits of the mains terminal disturbance voltages for the frequency range 9 kHz to 30 MHz are given in Table 2a.

Table 2a – Disturbance voltage limits at mains terminals

Frequency range	Limits dB(μV) ^a	
	Quasi-peak	Average
9 kHz to 50 kHz	110	–
50 kHz to 150 kHz	90 to 80 ^b	–
150 kHz to 0,5 MHz	66 to 56 ^b	56 to 46 ^b
0,5 MHz to 5,0 MHz	56 ^c	46 ^c
5 MHz to 30 MHz	60	50
^a At the transition frequency, the lower limit applies. ^b The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz. ^c For electrodeless lamps and luminaires, the limit in the frequency range of 2,51 MHz to 3,0 MHz is 73 dB(μV) quasi-peak and 63 dB(μV) average.		
NOTE In Japan, the limits in the frequency range 9 kHz to 150 kHz do not apply.		