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**LIMITS AND METHODS OF MEASUREMENT
 OF RADIO DISTURBANCE CHARACTERISTICS OF
 ELECTRICAL LIGHTING AND SIMILAR EQUIPMENT**
INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee CISPR F: Interference relating to household appliances tools, lighting equipment and similar apparatus, of IEC technical committee CISPR: International special committee on radio interference.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
CIS/F/777/DISH	CIS/F/790/RVDISH

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

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CISPR 15 interpretation sheet on the worst-case mode of operation
Introduction

Subclause 7.5 specifies the operating modes of lighting equipment that must be considered during an emission test. A few examples are given to support the explanation of what 'different operating modes' means. The list of examples is of course not exhaustive. Apparently, the example of 'colour shifting' is not clear enough and it is sometimes interpreted as if any possible colour and/or correlated colour temperature (CCT) setting that lighting equipment may produce shall be assessed during measurements. Many types of LED lighting may be set in many different colours and CCTs. Compared to other operational-mode related influence quantities such as light level regulation, flashing or radio communication, the risk of not capturing the maximum level of electromagnetic (EM) disturbances due to different colour or CCT settings is very small, provided that all channels of a LED driver used to change colour or CCT are operative. The 'colour shifting'-example was meant for example for a mode where the light output continuously switches from one colour to another with a certain repetition frequency (e.g. applied for entertainment, events etc.), instead of emitting a single stable colour and/or CCT.

Question

What is the meaning of example 'colour shifting' as mode of operation to be considered during testing? What colour and/or colour temperature should be selected in case lighting equipment can be set in a wide range of colours and/or CCTs?

Interpretation

The example 'colour shifting' in the first paragraph of 7.5 of CISPR 15:2018 must not be interpreted as if any possible colour and/or CCT setting that lighting equipment may produce shall be assessed during measurements.

Generally, according to 7.5 the worst case shall be found by prescanning every mode of operation over at least one repetition interval of the specific mode.

Alternatively, measurements can be performed using the setting(s) that are expected to produce the highest amplitude emissions relative to the limit; and, the reasons for the selection shall be given in the test report.

A reason could be that highest level of electromagnetic (EM) disturbances will be captured if all channels of a LED driver used to create different colours and/or CCTs are operative. The number of channels applied depends on the LED-driver/LED-light-source architecture. Often, maximum EM disturbances can be achieved by selecting a white colour and/or a CCT setting in the middle of the specified CCT range.

EXAMPLE Colour variation and CCT variation may be achieved using a 5-channel LED driver powering three LED strings for colour (RGB) setting and two cool white and warm white LED strings for CCT setting. Hence, in case the lighting equipment under test is capable to operate at different colours and/or CCTs, a white colour and/or a single CCT in the middle of the specified CCT range may be selected¹.

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¹ 7.4 of CISPR 15:2018, also still applies.

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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

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CISPR 15 edition 9.1 contains the ninth edition (2018-05) [documents CIS/F/733/FDIS and CIS/F/736/RVD], its interpretation sheet (2019-11), and its amendment 1 (2024-07) [documents CIS/F/851/FDIS and CIS/F/854/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough

red text. A separate Final version with all changes accepted is available in this publication.

International Standard CISPR 15 has been prepared by subcommittee CIS/F: Interference relating to household appliances tools, lighting equipment and similar apparatus, of IEC technical committee CISPR: International special committee on radio interference.

This ninth edition cancels and replaces the eighth edition published in 2013 and its Amendment 1:2015. This edition constitutes a technical revision.

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

- a) full editorial revision and restructuring;
- b) the restriction to mains and battery operation is deleted in the scope;
- c) radiated disturbance limits in the frequency range 300 MHz to 1 GHz have been introduced;
- d) the load terminals limits and the CDNE (alternative to radiated emissions) limits have changed;
- e) deletion of the insertion-loss requirements and the associated Annex A;
- f) introduction of three basic ports: wired network ports, local wired ports and the enclosure port;
- g) introduction of a more technology-independent approach;
- h) replacement of Annex B (CDNE) by appropriate references to CISPR 16-series of standards;
- i) modified requirements for the metal holes of the conical housing;
- j) new conducted disturbance measurement method for GU10 self-ballasted lamp;
- k) addition of current probe measurement method and limits for various types of ports (in addition to voltage limits and measurement methods);
- l) introduction of the term 'module' (instead of independent auxiliary) and requirements for measurement of modules using a host (reference) system;
- m) modified specifications for stabilization times of EUTs;
- n) for large EUT (> 1,6 m), addition of the magnetic field measurement method using a 60 cm loop antenna at 3 m distance (method from CISPR 14-1) as an alternative to the 3 m and 4 m LAS.

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

FDIS	Report on voting
CIS/F/733/FDIS	CIS/F/736/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.

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INTRODUCTION to Amendment 1

This Amendment includes the following significant technical changes with respect to CISPR 15:2018.

- a) The voltage probe method for the conducted disturbance measurement of local wired port other than the electrical power supply interface of ELV lamps has been deleted.
- b) Limits and measurement methods have been introduced for radiated disturbance of the enclosure port in the frequency range 1 GHz to 6 GHz.
- c) The test set-up for the conical metal housing for single capped lamps has been rotated.
- d) The arrangement of cables connected to interfaces of wired network ports has been modified. Cable length has been extended to 1,0 m.
- e) Measuring arrangements for conducted disturbances for very large EUTs have been clarified.
- f) Annex E regarding statistical methods has been deleted.

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