INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CISPR 15
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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.

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ICS 33.100.10

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 selected[1].

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