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Application of IEC 60335-2-27 for field inspections of UV emission of UV appliances

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APPLICATION OF IEC 60335-2-27 FOR FIELD INSPECTIONS OF UV EMISSION OF UV APPLIANCES

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IEC TR 63381 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
61/7339/DTR	61/7388/RVDTR

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 Technical Report 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/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

IEC 60335-2-27 provides requirements on the emission of UV radiation by UV appliances as covered by its scope. These requirements are intended for determining compliance during the type-testing of the products in a laboratory environment.

Later, market surveillance authorities would like to check this compliance at business locations in their territory, since the UV emission of these products can be influenced in different ways and health aspects can be ignored due to commercial interests, or just by a lack of knowledge.

The exchange of emitters can have an especially significant influence on the emission character of UV appliances. Fluorescent UV lamps and high-pressure metal halide lamps are showing strong ageing behaviour and are replaced for performance reasons at least every 1 000 hours.

IEC 60335-2-27 introduced in connection with IEC 61228 the so-called X/Y lamp equivalency code for UV fluorescent lamps and a marking on the appliances which lamps, with which code are to be used with the appliance. Additionally, IEC 60335-2-27:2024, 7.12 states:

The instructions for UV appliances shall include the substance of the following:

– *identification of components that can influence the ultraviolet radiation, such as filters and reflectors;*
– *identification of replaceable UV emitters and a statement that they are only to be replaced by types marked on the appliance. For fluorescent UV lamps for tanning, it shall be stated that they are only to be replaced by types marked with an equivalency code, the UV component of which falls within the UV component equivalency code range that is marked on the appliance. In this case, an example of the equivalency code shall be given and the UV component aspect of the fluorescent UV lamp for tanning equivalency code shall be explained.*

This information given by the manufacturer gives a good first attempt to control the UV emission of a UV appliance in the market.

Unfortunately, there are external conditions which can additionally influence the UV emission of UV appliances, so a market surveillance authority would like to measure a UV appliance in the market. Due to the weight of the appliances, it cannot be moved into a laboratory.

So, the measurement will be performed under non-laboratory conditions, which can include:

– different and maybe instable line voltage,
– different and instable temperature,
– emitters of an unknown aging status.

Additionally, the accurate measurement equipment as requested by IEC 60335-2-27 is

– quite heavy (could be about 50 kg), and
– difficult to handle. Most of the accurate double-monochromators would need an acclimation and therefore calibration at the measurement location.
– Measuring UV emission in a precise manner is quite slow. It would need some hours to perform a high precision measurement.

Therefore, this document provides advice on how to perform an inspection of UV emission in the field under these conditions, different from the conditions of a laboratory type-test, as described in IEC 60335-2-27, and the necessary background information about the differences between type-testing and field inspection. Additionally, it shows a procedure with escalation steps to perform that is used by some market surveillance authorities:

– a good, fast and efficient inspection on-site,

– an efficient measurement on-site,

– a full measurement under laboratory conditions.

APPLICATION OF IEC 60335-2-27 FOR FIELD INSPECTIONS OF UV EMISSION OF UV APPLIANCES

1 Scope

This document brings clarification and guidance concerning the assessment of the UV emission output of UV appliances in the field with respect to the type-testing requirements of IEC 60335-2-27:2024, Clause 32.

NOTE Periodic electrical inspection following IEC 60335-1:2020, informative Annex A can be additionally required in some countries.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60335-2-27:2024, *Household and similar electrical appliances – Safety – Part 2-27: Particular requirements for appliances for skin exposure to optical radiation*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*