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GB 19258-2012

Replacing GB 19258-2003

Ultraviolet germicidal lamp

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Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

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Foreword

Clause 5.1, 5.3, 5.6, 5.7, 5.9, 5.10 and 8.2 a), b), and c) of this standard are mandatory, AND the rest is recommended.

This standard was drafted in accordance with the rules given GB/T 1.1-2009.

This standard replaces GB 19258-2003 “Ultraviolet germicidal lamp”.

The differences between this standard and GB 19258-2003 are as follows:

- MAKE re-test of the ultraviolet luminance of every specification;
- PROVIDE the relevant provisions on the ultraviolet maintenance and service life maintenance.

This standard was proposed by the China Light Industry Federation.

This standard shall be under the jurisdiction of the National Lighting Standardization Technical Committee (SAC/TC 224).

The drafting organizations of this standard: Zhejiang Chenhui Lighting Co., Ltd., Guangdong Cnlight Optoelectronics Technology Co., Ltd., Beijing Institute of Light Sources.

The main drafters of this standard: Lu Guangming, Guo Pengxin, Peng Haijun, Gao Guangyi, Li Qijin.

This standard was first released in 2003, AND this is the first revision.

Ultraviolet germicidal lamp

1 Scope

This standard specifies the product classification, technical requirements, test methods, inspection rules and marking, packaging, transportation and storage of low pressure mercury vapor discharge ultraviolet germicidal lamp (hereinafter referred to as “lamp”).

This standard applies to the double-capped, single-capped or self-ballasted lamps which are manufactured by quartz glass, have or have no ozone, AND have the UV radiation peak wavelength of 253.7 nm.

This standard applies to the lamps of the power of 65 W below.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this Standard.

GB/T 1406.1 Types and dimensions of lamp caps - Part 1：Screw caps (IEC 60061-1:2005, MOD)

GB/T 1406.2 Types and dimensions of lamp caps - Part 2：Pin lamp caps (IEC 60061-1:2005, MOD)

GB/T 1406.5 Types and dimensions of lamp caps - Part 5：Bayonet caps (IEC 60061-1:2005, MOD)

GB/T 2828.1 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (ISO 2859-1:1999, IDT)

GB/T 2829 Sampling procedures and tables for periodic inspection by attributes (Apply to inspection of process stability)

GB/T 10682 Double-capped fluorescent lamps - Performance specifications

GB 16843 Single-capped fluorescent lamps - Safety specifications (IEC 1199:1993, IDT)

GB 16844 Self-ballasted lamps for general lighting services - Safety requirements (IEC 60968:1988, IDT)

GB/T 17262 single-capped fluorescent lamp performance requirements

GB/T 17263 Single-capped fluorescent lamps - Performance specification

GB 18774 Double-capped fluorescent lamps - Safety specifications (IEC 61195:1999, IDT)

HJ/T 47-1999 Technical conditions of sampler for stack gas

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Ultraviolet germicidal lamp

A low-pressure mercury vapor discharge lamp using quartz glass or other through-violet glass that discharges to produce UV radiation mainly of a wavelength of 253.7 nm, AND the UV radiation can kill bacteria and viruses.

3.2

Ozone output efficacy

The ratio of the amount of ozone generated by the lamp which is ignited at the specified conditions to the power consumed by the lamp within the unit time, in the unit of g / (kW • h).

3.3

Nominal value

The value as indicated on the lamp.

3.4

Rated value

The specific value of the lamp under the specified working conditions, the value and conditions of which are specified in this standard or by the manufacturer and seller.

3.17

Ultraviolet radiant flux maintenance

When the lamp ignites under specified conditions, the ratio of the ultraviolet radiant flux at a particular time during its lifetime to the initial ultraviolet radiant flux of the lamp, expressed as a percentage.

3.18

Reference ballast

Inductive ballasts specially designed for lamps operating at AC power frequencies or resistive ballasts designed for lamps operating at high frequencies. It is used as a benchmark for checking other ballasts, selecting reference lamps, and checking lamps that are normally produced under their standardized conditions. Basic characteristics of a reference ballast are as described in the standards on ballasts. The ballast has a stable voltage/current ratio at rated frequency, AND is relatively immune to current, temperature, and changes in the surrounding magnetic field.

3.19

Calibration current of a reference ballast

The current value based on which the reference ballast is calibrated or adjusted.

4 Product classifications

4.1 Classification and marking

Lamp can be divided into double-capped lamp (represented by “S”), single-capped lamp (represented by “D”), and self-ballasted lamp (represented by “Z”) based on its shape; AND it can be divided into two types in accordance with the presence of ozone: ozone-contained lamp (represented by “Y”) and ozone-free lamp (represented by “W”).

4.2 Model naming method

6.3 Overall dimensions (5.4)

It shall use the universal gauge or special gauge having an accuracy of not less than 0.05 mm for the testing.

6.4 Startup performance, electrical parameters and power (5.5, 5.6)

Single-capped lamp is tested in accordance with the test method as specified in GB/T 17262.

Self-ballasted lamp is tested in accordance with the test method as specified in GB/T 17263.

Double-capped lamp is tested in accordance with the test method as specified in GB/T 10682.

6.5 UV radiation efficiency/radiant flux (5.7)

MAKE test in accordance with method as specified in Appendix B.

6.6 Ultraviolet radiation luminance (5.8)

MAKE test in accordance with method as specified in Appendix A.

6.7 Ozone output rate (5.9)

MAKE test in accordance with method as specified in Appendix D.

6.8 UV radiant flux maintenance/life (5.10)

MAKE timekeeping after light it up in accordance with the provisions of Appendix C, and MAKE test and calculation in accordance with Appendix B.

6.9 Marking (8.1)

The correctness and clarity of the markings on the lamp are checked by the appearance method.

As for the fastness test, the single-capped lamp is tested in accordance with the method as specified in GB/T 17262, the self-ballasted lamp is tested in accordance with the method as specified in GB/T 17263, AND the double-capped lamp is tested in accordance with the method as specified in GB/T 10682.

d) The ozone output rate of the ozone-contained lamp;

e) Ultraviolet radiant flux.

8.3 Packaging

Each lamp is packaged in a small box AND then packed in a packaging box. Packaging shall be safe and reliable. The packing box shall be accompanied by the manufacturer's product certification or qualified seal in line with the requirements of 8.4.

8.4 Certificate

Certificate shall be marked of the following information:

a) Manufacturer's name or registered trademark;

b) Date of testing;

c) Inspector’s signature.

8.5 Packaging boxes

The packaging boxes shall be indicated of the following in Chinese characters:

a) Manufacturer's name or registered trademark;

b) Product name and model;

c) Number of lamps in the packaging box;

d) Factory site;

e) Product standard number;

f) Other relevant markings.

8.6 Storage

Lamp shall be stored in a ventilated room of relative humidity less than 85%, AND the air shall not contain corrosive gases.

8.7 Transportation

During the transportation of the lamp, it shall avoid rain and snow AND strong mechanical vibration.

Appendix A

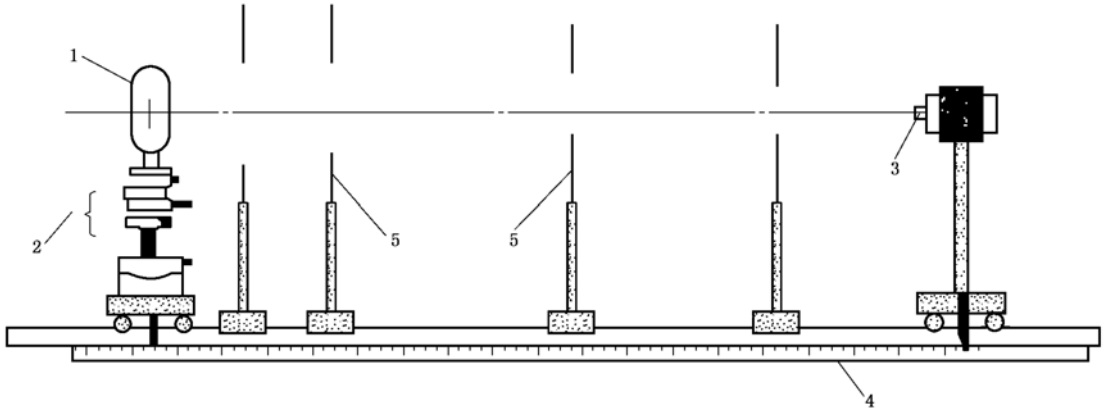
(Normative)

Measurement of ultraviolet radiation luminance

A.1 UV luminance measurement system

A.1.1 UV radiation luminance measurement system

UV radiation luminance measurement is to be carried out in the photometry bench. During measurement, the lamp and UV radiation luminance probe shall be accurately installed onto the measurement bench, AND the distance from the lamp to the probe shall be able to freely changed AND accurately measured, as shown in Figure A.1.



Description:

1 - Lamp;

2 - Positioning bench;

3 - UV probe;

4 - Light track;

5 - Light diaphragm.

Figure A.1 -- UV radiation luminance test system

At one end of the photometric bench, INSTALL the lamp under test onto a positioning bench in such a manner as able to be rotated AND translated along two horizontal directions, OR otherwise its height and lamp angle shall be adjusted to allow upwards, downwards, leftwards, and rightwards adjustment.

A.3.1 Fixed the tested lamp tube onto the light track; LIGHT it up in accordance with its characteristics; AND when the horizontal normal line of the lamp middle part passes through the UV irradiance meter's probe lighting point, the light emitting surface of the lamp (if any) shall be perpendicular to the light track AND be parallel to the UV irradiance meter's probe receiving plane.

A.3.2 INSTALL the UV irradiance meter on the light track, so that the normal line of receiving plane of the irradiance meter coincides with the horizontal normal line at the middle part of the tested lamp tube.

A.3.3 ADJUST the position of the UV irradiance meter so that the distance from the receiving surface of the UV irradiance meter to the tested lamp tube surface is 1000 mm ± 1 mm.

A.3.4 POWER on the power supply of the tested lamp tube in accordance with the provisions of A.2 to make it light up normally; PREHEAT it for 20 min.

A.3.5 After the lamp is stabilized, OPEN the shutter of the ultraviolet irradiance meter to directly read out the UV irradiance meter readings.

A.4 Safety operation requirements

In the testing process, the operator shall take effective measures to prevent eyes and naked human body parts from being exposed in ultraviolet radiation to prevent UV burns.

Appendix C

(Normative)

Life test method

C.1 Test conditions

C.1.1 Test environment

The test shall be carried out in a convection-free environment at a temperature of 15 °C ~ 50 °C. The lamp shall not be subjected to severe vibrations and collisions when it is light up.

C.1.2 Power supply

50 × (1 ± 0.5%) Hz, 220 × (1 ± 2%) V.

C.1.3 Lifetime ballast

C.1.3.1 The ballast shall comply with the provisions of GB/T 10682 and GB/T 17262 AND shall comply with the lamp starting conditions.

C.1.3.2 When the ballast is working matched with the tested lamp under the rated voltage, the difference between the power as consumed by this lamp and its rated value shall not exceed 4%; AND when the tested lamp is working matched with the reference ballast, the difference between the voltages at both ends of the lamp and the rated value shall not exceed 2% of the lamp.

C.1.3.3 When the ballast is working together with the lamp with starter, the preheating current at the rated voltage shall not be deviated more than 10% from the value as specified in the corresponding parameter table.

C.2 Light up time control

After the lamp is light up for 165 min, TURN it off for 15 min, AND the off time is not included in the life time.

C.3 Test methods and circuits

Lamp life test methods and test circuits shall comply with the provisions of GB/T 10682, GB/T 17262 and GB/T 17263.

C.4 Life calculation method

Appendix D

(Normative)

Ozone output rate test method

D.1 Test principle

Ozone (O_3) is a strong oxidizing agent that characteristically absorbs ultraviolet light with a wavelength of 253.7 nm. Measurement of spectral transmittance τ of the ozone gas at 253.7 nm, AND the relation between the ozone concentration and transmittance is as shown in formula (D.1).

$$\tau = e^{-\alpha c} \qquad \cdots\cdots (D.1)$$

Where:

τ - Light transmittance of ozone gas at wavelength 253.7 nm;

c - Ozone concentration;

α - Instrument absorption factor.

D.2 Test conditions

D.2.1 The lighting up circuit is as shown in the test circuit in Appendix A, AND it shall use the reference ballast.

D.2.2 Test environment: temperature: 25 °C ± 1 °C; relative humidity: 40% ± 10%; pressure: 101.3 kPa.

D.3 Test system

Ozone output test system shall comply with Figure D.1. Ozone collector is a closed container which is made of UV-aging resistant and ozone-free absorptive material.

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