

ONE-STOP SOLUTION FOR UV LAMPS & UV LIGHT SOURCE PRODUCTS

Background

Ultraviolet light is an electromagnetic radiation with wavelengths between 100nm to 400nm. It can be classified into three wavelength ranges: UV-C (100nm to 280nm; strong germ-killing ability), UV-B (280nm to 315nm; helps human body generate Vitamin B), and UV-A (315nm to 400nm; capable to solidify paint ink and oil).

There are a wide range of household products that are taking advantage of this technology. The most common example is UV lamps, which causes damage to the nucleic acid of microorganisms by forming covalent bonds between certain adjacent bases in the DNA. The formation of such bonds prevents the DNA from being unzipped for replication, and the organism is unable to reproduce. In fact, when the organism tries to replicate, it dies. Due to this property, UV light is widely used in all kinds of industries such as house appliances, lightings, water purification and food contact products.



SGS One-Stop Solution

With our global expertise and International Type approval services, SGS can provide safety and performance testing and certification services on UV lamps and light source products. Furthermore, our experts can provide protocol & various customized services for your products to ensure safe entry into global markets.

1. Ozone concentration test

- UV light will generate ozone, and human respiratory system will be harmed under excessive ozone concentration environment

STANDARD	RELATED PRODUCT(S)
IEC 60335-1 Household and similar electrical appliances - safety - part 1: General requirements	Household appliances with UV light source
IEC 60335-2-65 Household and similar electrical appliances - safety - part 2-65: particular requirements for air-cleaning appliances	
IEC 60335-2-109 Household and similar electrical appliances - safety - part 2-109: particular requirements for UV radiation water treatment appliances	
GB/T 18801 Air cleaner	
GB 21551.3 Antibacterial and cleaning function for household and similar electrical appliances - particular requirements of air cleaner	

2. UV ageing test and product ageing test

- UV light can lead to ageing of product material and internal wiring

STANDARD	TEST ITEM	RELATED PRODUCT(S)
IEC 60335-1: Annex T Household and similar electrical appliances - safety - part 1: general requirements	Plastic exposure to UV light ageing test	Household appliances with UV light source
GB/T 19258 Annex A and C Ultraviolet germicidal lamp	UV radiation decay	
GB/T 19258 Annex C Ultraviolet germicidal lamp	Products lifecycle	

3. Photobiological safety Test

- Proper UV radiation can kill germs. However, excessive UV radiation will result in damage to human retina and skin (either acute or chronic damage)

STANDARD	TEST ITEM	RELATED PRODUCT(S)
IEC 60335-2-27 Household and similar electrical appliances - safety - part 2-27: Particular requirements for appliances for skin exposure to optical radiation	UV radiation emission test	Household appliances with UV light
	Total effective irradiance	
	Maximum transmission of goggles	
IEC 60335-2-113 Household and similar electrical appliances - safety - part 2-113: Particular requirements for cosmetic and beauty care appliances incorporating lasers and intense light sources	Intense light source (ILS) risk group	Household appliances with UV light
	Accessible emission limit	
	Stray optical radiation	
IEC 60335-2-109 Household and similar electrical appliances - safety - part 2-109: Particular requirements for UV radiation water treatment appliances	UV irradiance	Household appliances with UV light
IEC 60335-2-65 Household and similar electrical appliances - safety - part 2-65: Particular requirements for air-cleaning appliances		
IEC 60335-2-59 Household and similar electrical appliances - safety - part 2-59: Particular requirements for insect killers		
IEC 60335-2-40 Household and similar electrical appliances - safety - part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers		
ICNIRP guideline		
GB/T 20145, IEC 62471 Photobiological safety of lamps and lamp systems	Risk Group I	Ultraviolet germicidal lamp
GB/T 19258 Annex A Ultraviolet germicidal lamp	UV irradiance	

4. Product Safety and EMC certification

- Overall safety standard CB Certification scheme

STANDARDS	
IEC 60335-1 Household and similar electrical appliances - Safety - Part 1: General requirements	IEC 60335-2-27 Household and similar electrical appliances - Safety - Part 2-27: Particular requirements for appliances for skin exposure to optical radiation
IEC 60335-2-109 Household and similar electrical appliances - Safety - Part 2-109: Particular requirements for UV radiation water treatment appliances	IEC 60335-2-113 Household and similar electrical appliances - Safety - Part 2-113: Particular requirements for cosmetic and beauty care appliances incorporating lasers and intense light sources
IEC 60335-2-65 Household and similar electrical appliances - Safety - Part 2-65: Particular requirements for air-cleaning appliances	IEC 60335-2-40 Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
IEC 60335-2-24 Household and similar electrical appliances - Safety - Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers	IEC 60335-2-2 Household and similar electrical appliances - Safety - Part 2-2: Particular requirements for vacuum cleaners and water-suction cleaning appliances

- European: CE-EMC

STANDARDS	
For dedicated UV Lighting in household environment:	
EN 55015 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 61547 Equipment for general lighting purposes - EMC immunity requirements
EN 61000-3-2 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)	EN 61000-3-3 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
For other UV related EE products:	
EN 55014-1 Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 61000-3-2 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)
EN 55014-2 Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard	EN 61000-3-3 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

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WHEN YOU NEED TO BE SURE

